ABSTRACT

This study investigates antecedents to and outcomes of two stress reactions, telework distress (detrimental stress) and telework eustress (beneficial stress), using a model derived from an integration of the transactional model of stress with the job demands and resources model. The model includes a person antecedent (resilience) and three environment antecedents (work-family conflict, work overload, and autonomy). These factors should influence experienced distress and eustress, which, in turn, affect telework outcomes (telework satisfaction, exhaustion, perceived performance, and perceived productivity). The model is evaluated using a sample of 329 Chinese teleworkers. The study findings indicate that resilience, work-family conflict, and work overload affects experienced distress, while resilience and autonomy affects experienced eustress. Experiencing distress influenced satisfaction, exhaustion, and perceived performance; eustress had effects on all four outcomes. Interestingly, resilience had the largest total effect sizes on telework outcomes.

KEYWORDS

Stress, Telework, Telework Distress, Telework Eustress

INTRODUCTION

Telework, also known as telecommuting, is an alternative, remote work arrangement in which workers perform work tasks from locations not provided by employers, using information and communication technologies (Bélanger, Collins, & Cheney, 2001). The COVID-19 pandemic led to a rise in telework, as many organizations turned to remote work to continue operations (Carman & Nataraj, 2020). Some predict that telework and other alternative work arrangements may represent a “new normal” in which telework is more common and more widely accepted by workers and employers (Sinclair et al., 2020).

Because of the rise in telework, it is increasingly important to understand teleworkers’ psychological responses to telework, and the consequences of those reactions. In this study, we are interested in telework stress and its outcomes. The effect of telework on stress is not clear. Some studies indicate that telework may reduce stress (e.g., Gajendran & Harrison, 2007; Allen, Golden & Schockley, 2015), but there is also reason to believe that telework may increase stress due to the

DOI: 10.4018/JGIM.304063

*Corresponding Author
uncertainties involved. We examine two forms of stress responses, telework distress (detrimental stress) and telework eustress (beneficial stress).

Due in part to the COVID-19 pandemic, telework has become an increasingly global phenomenon, making it important to conduct telework research in various countries. As a growing economic force, China is an important context in which to study telework. China has lagged Western countries in the use of telework (Bloom, Liang, Roberts, & Ying, 2015; Long, Kuang, & Buzzanell, 2013; Luo, 2015a), but recent events have led to substantial growth in teleworking in China. Unfortunately, there is scant research into the psychological aspects of telework in the Chinese context. Understanding telework in China is important because country-level factors may affect how virtual environments are received (Chen, Wu, & Chung, 2008; Palvia et al., 2018).

When the COVID-19 pandemic took hold, many organizations turned to telework in order to maintain operations. This led to a tremendous increase in the extent of telework. This sudden shift in the nature of work occurred contemporaneously with other challenges and changes related to the pandemic. The multi-faceted change brought on by COVID-19 led to considerable uncertainty for people’s work and personal lives, which created stress for many. Those workers who shifted to telework were faced additional stress. For these workers, telework represented a situation that was novel, but not entirely new; they were performing the same job in new ways. Situations that are novel, but not entirely new are likely to bring about stress responses (Lazarus & Folkman, 1984). Because of this, understanding stress among teleworkers is an important area of research.

Three other factors make studying telework during a pandemic interesting. First, for many workers, the shift to telework occurred suddenly. Because of this, there was often insufficient time to prepare workspace at home or acquire new equipment or furnishings that would make telework easier. Second, many households had multiple family members who had to rapidly move to working or learning at home. This led to competition for resources, such as workspaces, technology, and Internet bandwidth. Third, organizations had little time to prepare employees for telework or to reorganize work and communication processes to accommodate telework. This often resulted in disorganized work processes (Chong, Huang & Chang, 2020). All of this made for a degraded telework environment, which further contributed to an already stressful situation.

Although stress has been a topic of interest among telework researchers for some time, these new circumstances call for reconsidering whether our existing knowledge of telework stress is adequate. This is especially true due to what has been called the “telecommuting paradox” (Westfall, 1997), which results from “mutually incompatible consequences” for teleworkers (Gajendran & Harrison, 2007). For example, the ability to work from home is thought to enhance autonomy, which should reduce distress. However, at the same time, telework may blur work-home boundaries, which may lead to increased work-family conflict and distress. In addition, the multiple uncertainties involved in the rapid shift to telework brought about by COVID-19 is likely to result in distress among teleworkers. One possible way to reconcile these effects is to consider how situational factors are appraised as either challenges or threats. When challenge appraisals predominate, impacts on telework outcomes are likely to be beneficial, but when threat appraisals predominate, telework outcomes are likely to suffer.

Lazarus and Folkman’s (1984) transactional model of stress offers a useful lens through which to view such effects. Essentially, the transactional model states that encounters between individuals and their environment are initially appraised as to whether they have the potential to impact well-being. Interactions that are seen as possibly affecting well-being are subjected to a secondary appraisal that involves considering whether the encounter represents a challenge or threat. This appraisal leads to immediate and long-term outcomes. Telework represents a potentially stressful, relevant interaction between an individual and an environment, making the transactional model useful for understanding long-term effects from telework stress. Note Lazarus and Folkman (1984) use “long-term” to distinguish from the immediate effects of the stress appraisal process.

By applying the transactional model of stress to telework during a pandemic, we provide a useful framework that can be applied to telework in other contexts, and to work more generally. In
In addition, we identify several antecedents that determine whether teleworkers experience distress or eustress, and ultimately important telework outcomes. This allows us to contribute to scholarly conversations about the paradoxical outcomes of telework, and to the literature concerning telework stress. With respect to the telework stress literature, we demonstrate the role of secondary appraisals in determining both immediate and long-term outcomes. We also show how the job-demands and resources model can be integrated with the transactional model of stress. Our empirical results may be useful for managers of telework who may seek to reduce the negative consequences of stressful person-environment interactions.

In this paper, we investigate the following research questions in the context of China. Does the extent of distress and eustress experienced by teleworkers affect telework outcomes? Do person and environment antecedents affect the extent of distress and eustress experienced by teleworks?

Specifically, we investigate whether experienced telework distress and eustress are related to telework exhaustion and satisfaction as well as whether resilience, work-family conflict, work overload, and autonomy affect the extent of distress and eustress experienced by teleworkers. We use data from a survey of Chinese teleworkers to test a research model related to the research questions. The paper is organized as follows. In the next section, we provide background information related to telework in the Chinese context. Then, we discuss our research model and related hypotheses. This is followed by a discussion of our research method and results. Next, we discuss our results, including implications for research and practice. We close the paper by offering some concluding remarks.

BACKGROUND

Telework and Stress

Telework is an alternative work arrangement that involves employees using information and communication technologies (ICT) to allow working from locations that are not provided by their employers, typically their home (Bélanger et al., 2001). COVID-19 led to increasing interest in telework as many organizations turned to telework to ensure operational continuity. Numerous benefits of telework have been proposed, including increased productivity, increased organizational commitment, employee satisfaction, and well-being (Charalampous, Grant, Tramontano, & Michailidis, 2019; Fonner & Roloff, 2010; Pinsonneault & Boisvert, 2001; Virick, DaSilva, & Arrington, 2010). However, negative consequences of telework have also been identified, including difficulties in managing work-family boundaries. A contradiction exists with respect to telework and its effects on stress. Some common characteristics of telework, such as increased autonomy should reduce harmful stress, while others, such as social isolation are thought to increase this stress (Gajendran & Harrison, 2007). We believe one possible resolution to this contradiction comes from a recognition that stress is not always harmful – both “good” and “bad” stress exist.

Psychological stress (as opposed to physiological stress) can be defined as an interaction a person and the environment that is appraised by the person as endangering her or his well-being (Lazarus & Folkman, 1984). According to the transactional model of stress (Lazarus & Folkman, 1984), when a person-environment interaction occurs, the person makes an initially appraises whether the interaction has the potential to affect well-being. If that appraisal indicates that such potential, a secondary appraisal is made based on whether the encounter represents a potential for loss (a threat) or gain (a challenge). Note that these are not mutually exclusive. An interaction may represent the potential for both gains and losses. If the potential for losses are gains are seen as being present, a secondary appraisal occurs to evaluate the extent to which the person can control whether the interaction will ultimately lead to losses or gains.

Stress is a response to the perceived presence of stressors, which are stimuli that exist in the environment and are seen as affecting a person’s psychological or physical well-being (Califf, Sarker, & Sarker, 2020; Hargrove, 2013). Stress has typically been viewed as a negative consequence of
telework (Stich, 2020). However, stress responses are not necessarily negative; there is growing recognition that stress can also be beneficial (Nelson, 2007; Tarafdar, Cooper, & Stich, 2017; Van den Broeck, De Cuyper, De Witte, & Vansteenkiste, 2010). This beneficial response to stressors is known as eustress (Selye, 1976), which is “the healthy, positive, constructive outcome of stressful events and the stress response” (Quick, Cooper, Gibbs, Little, & Nelson, 2010 p.4). In contrast, distress is “the unhealthy, negative, destructive outcomes(s) of stressful events and/or the stress response” (Quick et al., 1997, p. 4).

Unlike distress, which involves feelings of despair that result in probable withdrawal and avoidance behaviors, eustress involves feelings of being challenged and may lead to coping behaviors that lead to improved positive outcomes (Selye, 1976; Van den Broeck et al., 2010). Although compared to distress, empirical research into eustress and its effects is relatively lacking, eustress has been studied in several environments, including healthcare (Simmons & Nelson, 2001), higher education (O’Sullivan, 2011), and information technology (Califf et al., 2020). There are calls for broadening the understanding of the impact of stress within organizations (Cooper, Dewe, & O’Driscol, 2001; O’Sullivan, 2011). Although stress is usually associated with negative feelings, stress reactions are not always bad nor unavoidable because a certain level of stress is necessary for motivation, growth, and development. Distress occurs when unwanted, unmanageable situations are damaging or hindering to employees’ efforts to complete work tasks.

In the telework context, teleworkers may perceive the sudden transition to work from home as bringing about tension and confusion regarding how to complete regular work tasks, which would generate distress. On the other hand, emergent interactions between telework, technology, and workers offer opportunities for achievement and for improving skills, potentially resulting in eustress.

Distress and eustress are thought to have consequences related to work outcomes, such as satisfaction and exhaustion (Belanger, 1999; Pinsonnault & Boisvert, 2001; Gajendran & Harrison, 2007; Golden, 2006; Sardeshmukh et al., 2012; Weinert et al., 2015; Van Slyke et al., 2022). Job satisfaction is often cited as a benefit of telework, although there is inconsistent empirical support for this relationship (Allen et al., 2015; Suh & Lee, 2017). It is possible that the effects of telework characteristics on experienced distress and eustress could help explain these conflicting results. A similar situation exists with exhaustion. Factors such as reduced face-to-face interactions and commuting time should reduce exhaustion, while dealing with telework-induced work-family conflict and increased workload may increase exhaustion (Weinert et al., 2015). Again, the mediating role of eustress and distress may help explain differential effects of teleworking on exhaustion.

Table 1 provides an overview of the extent research examining telework satisfaction, exhaustion, distress, and eustress. We aim to add to this body of literature by examining eustress and distress among teleworkers in China. We do this by studying the impact of several characteristics of telework that may be related to telework distress or eustress, as discussed later.
Telework in China

Although the percentage of the Chinese workforce engaged in telework is unclear, it is generally accepted that telework is less prevalent in China than in other countries, such as the United States (Liang, 2020). Numerous cultural and contextual factors have limited the uptake of telework in China (Jie et al., 2022). For example, the prevalence of top-down, autocratic leadership leads to close supervision. Many Chinese managers are reluctant to give up this close supervision by allowing workers to work from home (Luo, 2015a; Liang, 2020). As a high-context country, nonverbal cues and environmental settings are important in determining the meaning of events, leading to a preference for rich media, such as face-to-face interactions (Li, et al., 2007; Raghuram & Gang, 2014; Luo, 2015b). The physical distance and social isolation of telework make it difficult for members of high-context cultures. Work intensification (working long hours as an expectation) is common in China (Cooke & Jing, 2009), which may also help account for its relatively low teleworking rate (Jie et al., 2022). Chinese employers’ human resource policies may also hinder telework. For example, Chinese organizations’ performance appraisal tends to be very subjective, which may deter employees from wanting to be physically separated from their supervisors (Luo, 2015a). The hierarchical, command-and-control management structure common in China also inhibits telework adoption (Raghuram & Gang, 2014). Finally, traditional notions of work may hinder the adoption of telework. Chinese workers tend to view being absent from the workplace as being a sort of dereliction of duty, which runs contrary to Chinese workers’ values (Long et al., 2013; Luo, 2015b).

The collectivist nature of Chinese culture may also impact attitudes towards and outcomes of telework (Lou, 2015). Despite advances in video conferencing and other technologies intended

---

**Table 1. Overview of telework literature**

| Construct | Summary of literature | Citations |
|-----------|-----------------------|-----------|
| Satisfaction | Job satisfaction is one of the most commonly claimed benefits of telework. Generally, telework is thought to increase job satisfaction, but empirical studies of this relationship have shown inconsistent results (Allen et al., 2015; Suh & Lee, 2017). One possible reason for the inconsistent results is the role of stress. | Belanger (1999); Pinsonnault & Boisvert (2001); Gajendran & Harrison (2007); Fonner & Rolof (2010); Allen et al. (2015); Bentley et al. (2016); Suh & Lee (2017) |
| Exhaustion | Exhaustion may be an important variable that may help explain the impacts of telework. One the one hand, telework may reduce exhaustion due to reduced continuous face-to-face interactions and reduced commuting time. However, negotiating work-family conflict, and dealing with additional workload that may come from telework may lead to increased exhaustion. The impacts of telework on exhaustion may be mediated by stress. | Golden (2006); Sardeshmukh et al. (2012); Weinert et al. (2014); Weinert et al. (2015); Van Slyke et al. (2022) |
| Eustress | Beneficial responses to telework stressors are not well researched, but the positive impacts of eustress have been demonstrated in other work-related contexts. | Simmons & Nelson (2007); Hargrove et al., (2013); Tarafdar et al. (2017); Van Slyke et al. (2022) |
| Distress | Some telework studies find that teleworkers experience less stress than non-teleworkers, but others find the opposite. Further, some characteristics of telework (e.g. autonomy) should reduce distress, but others (e.g. social isolation) may increase negative consequences of telework; this has been called the telework paradox. Studies have shown that some stressors affect telework outcomes such as satisfaction and exhaustion, but the mediating role of experienced telework distress has not been well-studied. | Mann & Holdsworth (2003); Gajendran & Harrison, (2007); Weinert et al. (2014); Weinert et al. (2015); Bentley et al. (2016); Stich (2020); Song & Gao (2020); Carillo et al. (2021); Otsuka et al. (2021) |
to facilitate social contact, to date, these technologies do not fully mitigate the effects of physical separation on perceptions of social contact. In collectivist cultures, such as China, individuals tend to view themselves as being interdependent with others. Further, there is an emphasis on group views, needs, and goals – group social norms and duties determine one’s behaviors (Jiaxue, 2009; Raghuram & Fang, 2014). Telework involves a physical separation between the individual and their group, which makes collective norms, views, and values harder to discern. In addition, the relatively isolated nature of telework is at odds with the group-based self-identity that is common among members of collectivists cultures. Further, the rigid hierarchical relationship between Chinese workers and their supervisors requires recognizing and maintaining the status differentials between workers and supervisors, which is made more difficult by telework (Long et al., 2013; Raghuram & Fang, 2014). These factors may lead to increased distress for Chinese teleworkers, which may bring about other negative effects.

Despite the barriers to telework in China, the COVID-19 outbreak has led to a rapid, dramatic rise in telework among Chinese workers (Liang, 2020). Measures to control the spread of COVID-19 forced millions of Chinese workers into telework. By late January 2020, more than 200 million Chinese workers were telecommuting (Liang, 2020). In essence, Chinese workers and employers were forced into telework. Although the rise of telework in China has the potential to benefit Chinese workers, there are fears that it will make the Chinese “overwork culture” even more prevalent (Liang, 2020). In addition, the relatively small physical size of many Chinese homes may make it difficult for Chinese workers whose spouses, partners, or roommates also work at home to negotiate boundaries in a way that allows domestic harmony (Liang, 2020; Jie et al., 2022), which could lead to significant stress among Chinese teleworkers.

The factors described in this section make it important to understand Chinese workers’ psychological responses to telework. To investigate these responses, we created the research model described in the following section.

RESEARCH MODEL

The basic framework guiding our research comes from an integration of Lazarus & Folkman’s transactional model of stress (1987) with the job-demands and resources model (JD-R) (Demerouti et al., 2001). The transactional model views stress as a property of the interaction between a person and an environment. This model contends that person and environment antecedents feed into primary and secondary appraisals that, together with coping, result in immediate and long-term effects. The primary appraisal assesses whether the encounter with the environment holds possible implications for well-being. When the primary appraisal results in a belief that the encounter does have the potential to impact well-being, a secondary appraisal occurs. This appraisal evaluates the degree of control the individual thinks they have over the stressful environmental encounter. These beliefs determine whether the appraisal perceives the encounter as a challenge or a threat. These control beliefs depend not only what can be done, but also an individual’s beliefs about their ability to control themselves in the face of a stressful situation.

These appraisals result in immediate and long-term effects. Immediate effects can be affective or physiological (Lazarus & Folkman, 1984). For example, when appraising an environmental encounter as a threat, an individual’s pulse rate may increase, and they may experience fear. Because telework distress and eustress are affective in nature, we position them as immediate effects of the appraisal processes. Although stress has typically been viewed as a negative consequence of telework, it is also possible that the person-environment interactions involved in telework will be beneficial. Feelings of eustress results from challenge appraisals, while distress feelings come from an appraisal that the stressful encounter is a threat. When a teleworker experienced eustress beneficial long-term effects are likely, while the opposite is true when a teleworker experienced distress. As the name implies, long-term effects are more enduring adaptations and may include somatic health changes, morale-
oriented changes such as changes in well-being or satisfaction, and social functioning (Lazarus & Folkman, 1984).

We adapt the transactional model of stress to the telework context by applying elements of JD-R. JD-R was originally developed to investigate employee burnout and has been applied to the study of other psychological aspects of work, including exhaustion and job performance, among others (Bakker & Demerouti, 2007, 2014, 2017). JD-R proposes that job demands and job resources affect job stress and related constructs. Job demands are aspects of work that carry psychological or physiological costs, while job resources are aspects of the job that help one achieve work goals or personal development (Bakker & Demerouti, 2017). JD-R has been extended to include personal resources, which concern beliefs about the extent of control one has over their environment. Personal resources include, but are not limited to self-efficacy, optimism, and self-esteem (Bakker & Demerouti, 2014, 2017).

Prior telework research has used JD-R. For example, Sardeshmukh et al. (2012) found that job demands (specifically time pressure, role ambiguity, and role conflict) impacted exhaustion, while job resources (autonomy, feedback, and social support) affected both exhaustion and engagement. Another study (Nakrošienė, Bučiūnienė, & Goštautaitė., 2019) applied JD-R to a study of telework satisfaction and productivity. Drawing on the transactional model of stress, we believe that experienced stress may be an intervening cause in these relationships. To our knowledge, no studies have investigated how job demands and resources influence experiences of distress and eustress in the context of telework.

Figure 1 shows our adaptation of the transactional model of stress. We position personal resources from JD-R as person antecedents, and job demands and job resources as environment antecedents. These antecedents represent the person-environment encounter, which is appraised as either a challenge or a threat. The immediate effects of these appraisals are feelings of eustress or distress, which result in long-term effects. Note that the appraisal process is a cognitive process and thus not amenable to survey measurement. Therefore, we include experienced telework eustress and distress as the immediate effects of the appraisal process.

Figure 1. Transactional Model of Stress (Adapted from Lazarus & Folkman (1987))

Note: The parallelogram represents a cognitive process that is not operationalized in our study. A sizable array of job demands, job resources, and personal resources have been studied. Of course, it is not feasible to include all of these in a single study, thereby we focus on main factors that are especially important in the telework context. We acknowledge that there are other antecedents that may also be interesting.

Before turning to the discussion of specific antecedents and outcomes, it is important to note that eustress is not merely the absence of distress; the two stress responses are distinct constructs. Thus,
a stressor can result in both distress and eustress (Simmons & Nelson, 2007). Consider the example of a project manager who is assigned to lead a large, high-profile project. The project manager may believe that the assignment carries significant potential for career enhancement, leading to eustress. Simultaneously, if the project is a failure, the project manager may be demoted or terminated. This potential threat may lead to distress. So, the same stressor, the assignment, may lead to both distress and eustress. Previous telework studies considered stress as a negative factor toward employees (Fonner & Roloff, 2012; Stich, 2020; Suh & Lee, 2017; Weinert, Maier, Laumer, & Weitzel, 2014), but has not adequately examined eustress. Note that our concern here is with experienced distress and eustress as an immediate effect of the stress appraisal processes.

We expect that most work situations elicit a mixed bag of both positive and negative responses in individuals. We expect that positive and negative responses are separate, and distinct in nature (Edwards & Cooper, 1988; Nelson, 2007). To assume the positive by simply observing the absence of the negative, or vice versa, is an unacceptably simplistic approach to understanding the sources, responses, and consequences of stress.

In our study, we include one personal resource (resilience), one job resource (autonomy), and two job demands (work-family conflict, and work overload). In addition, our model includes two telework outcomes, which are satisfaction and, telework exhaustion. Figure 2 shows our research model. In the following subsections, we discuss the rationale behind each hypothesis.

**Figure 2. Research Model**

**Person Antecedent – Resilience**

Teleworkers face numerous hurdles as they pursue work activities from home. The extent to which they believe they are able to overcome these difficulties is likely to impact the way in which they view
their encounters with the telework environment. Resilience is an individual’s capacity to bounce back from adversity, which relates to an individual’s belief in overcoming stressful situations (Luthans, Luthans, & Luthans, 2004). When in a risky workplace environment, resilient individuals tend to show positive coping and behavioral adaptation (Burns, Posey, Roberts, & Lowry, 2017). They approach stress pragmatically, strengthening their strategies for managing and rebounding from stress. Work-from-home due to COVID-19 has brought growing uncertainty and stress to employees who suddenly became teleworkers; therefore, resilience is an important factor to consider.

While dealing with stress, resilience is often considered an important personal resource that can strengthen resistance to the negative consequences of stress and open access to positive emotions (Cooper et al., 2001; Luthans et al., 2004; Ong, Bergeman, Bisconti, & Wallace, 2006). Previous studies have found that with respect to stress, resilience is more important than experience or training in determining success (Coutu, 2002). One way resilience is thought to help individuals deal with stress is through the resilient individual’s tendency to find adaptive ways to manage stressors (Ong et al., 2006), perhaps to the point at which stress is transformed into a growth experience. Resilient people often experience positive emotions even when encountering stressful circumstances (Ong et al., 2006).

As aforementioned, resilience represents a belief that one has the ability to overcome difficulties associated with stressful person-environment interactions. Such beliefs may result in both threat and challenge appraisals. With respect to threat appraisals, resilience beliefs indicate that an individual has the ability to persevere through any difficulties encountered, which should reduce the extent to which the stressful situation is seen as a threat, which will, in turn, reduce feelings of distress. At the same time, a belief that one is resilient may also represent a belief that the individual can “soldier on” through early difficulties and eventually reap benefits from the stressful encounter, leading to a challenge appraisal, and therefore feelings of telework eustress – resilience may lead to experienced telework eustress. Thus, it seems reasonable to think that resilience will be associated with both reduced experienced telework distress and increased experienced telework eustress. Therefore, we posit the following hypotheses:

H1a: Resilience will have a negative relationship with experienced telework distress.
H1b: Resilience will have a positive relationship with experienced telework response.

Environmental Antecedents – Job Demands and Job Resources

Our model includes three environmental antecedents drawn from the JD-R and telework literatures. Two of these, work-family conflict and work overload, are job demands, and one, autonomy, is a job resource. We chose these antecedents due to their salience to telework. Work-family conflict is often studied with respect to telework. Interestingly, telework may, in some cases, reduce work-family conflict due to increased flexibility and reduced commuting time, which may make that time available for family matters. At the same time, however, telework may blur home-work boundaries, which may increase work-family conflict. Teleworkers also seem to be prone to work overload (Morganson et al., 2010; Weinert et al., 2014). In contrast, autonomy is often touted as a benefit of telework (Gajendran and Harrison, 2007; Nakrošienė et al., 2019). We acknowledge that there are other environment antecedents that we could be included in our study.

Work-family conflict refers to the tension between the demands of work and family, which is one of the several salient elements of the telework environment (Cooper et al. 2001). In the transactional model of stress, work-family conflict is an environment antecedent. Previous studies have suggested and found that individuals’ home environments could potentially bring about negative emotions. Work-family conflict has been found to significantly impact strain and exhaustion (Ayyagari, Grover, & Purvis, 2011; Golden, 2012; Mann & Holdsworth, 2003). Constant interaction with different technologies such as laptops, monitors, cell phones, and other ICT devices at home could make
teleworkers perceive interference or invasion of personal and work boundaries (Suh & Lee, 2017). With respect to the transactional model of stress, we expect work-family conflict to increase the chances that a stressful person-environment encounter will be appraised as a threat to one's well-being. As a result, we expect work-family conflict to be associated with increased telework distress, as noted below.

H2: Work-family conflict when teleworking will have a positive relationship with experienced telework distress.

Work overload is the belief that the amount of effort required to complete work tasks exceeds the individual’s capacity (Ayyagari et al., 2011; Cooper et al., 2001; Maier, Laumer, Weinert, & Weitzel, 2015; Weinert et al., 2014). Perceptions of work overload have been demonstrated to impact psychological outcomes such as telework strain (Suh & Lee, 2017; Weinert et al., 2014), telework exhaustion (Weinert et al., 2015), and work exhaustion (Ahuja, Chudoba, Kacmar, McKnight, & George, 2007). Previous studies have found significant positive correlations between work overload and various negative psychological outcomes. One way in which these relationships may occur is through stress appraisals. Work overload is an environmental factor reflecting a belief that individuals lack the capacity to complete work tasks. When this is the case, work overload is likely to be appraised as a threat because a feeling of work overload may be accompanied by a feeling of reduced control due to a perceived inability to complete work tasks due to lack of capacity. This is seen as a lack of efficacy, resulting in low control perceptions. These effects may be especially important in telework due to the less clear and more permeable work-home boundaries. These lead to the person-environment encounter being appraised as a threat to well-being, which results in increased distress, as stated in the hypothesis below:

H3: Work overload when teleworking will have a positive relationship with experienced telework distress.

Autonomy is defined as the degree of discretion one has in structuring and controlling when and how job tasks are performed; in other words, it is the extent to which employees evaluate how they can manage and structure their work (Gajendran & Harrison, 2007; Spector, 1986). Previous studies found that autonomy has a positive correlation with positive organizational outcomes, such as organizational commitment (Ahuja et al., 2007), employee engagement (Crawford, LePine, & Rich, 2010), job satisfaction (Hornung & Glaser, 2009), performance confidence (Deci & Ryan, 2000), among others. Moreover, autonomy has been found to be an advantage of telework (Nakrošienė et al., 2019), because telework’s flexibility allows employees more choice over where, when, how they perform work tasks (Gajendran & Harrison, 2007; Sardeshmukh, Sharma, & Golden, 2012; Suh & Lee, 2017). Two additional outcomes of autonomy are of particular interest here. First, autonomy positively impacts job satisfaction (Deci & Ryan, 2000; Kompier & Taris, 2005; Spector, 1986), including in the context of telework (Gajendran and Harrison, 2007; Nakrošienė et al., 2019; Suh and Lee, 2017). This effect may be mediated by telework distress. Previous findings suggested a negative relationship between autonomy and negative stress and strain among teleworkers (Sardeshmukh et al., 2012; Suh and Lee, 2017). Second, autonomy has been empirically demonstrated to be positively associated with eustress (Diller, Jeffery, & Fiedler, 2016). In addition, autonomy allows workers to structure their work ways that they believe may reduce distress and increase eustress. Therefore, it is worth evaluating how autonomy may influence the individual’s eustress and distress responses.

Autonomy represents an environment antecedent in the transactional model of stress. According to that model, teleworkers will include their perceptions of autonomy in their appraisal process. Interestingly, it is possible that autonomy may be appraised as both a threat and a challenge. The challenge appraisal is relatively straightforward. Beliefs about the degree of control one has over
a stressful person-environment encounter affects whether that encounter is appraised as a threat or a challenge. Increased perceptions of control are likely to result in challenge appraisals, which are associated with eustress. So, we can expect a positive relationship between autonomy and experienced telework eustress.

However, autonomy also brings ambiguity. Autonomy represents freedom, but also represents a lack of situational clarity. When the manner and timing of work tasks are prescribed, teleworkers know what they should do, and when they should do it. But when given autonomy, the teleworker must now make these decisions. The extent to which the teleworker’s choices align with those of management is unclear. When the choices do not align with management’s expectations, the teleworker may suffer negative consequences. So, ambiguity can lead to threat appraisals (Lazarus & Folkman, 1984), which can lead to distress. Thus, we believe that autonomy will have positive relationships with both experienced telework distress and experienced telework eustress, as shown below:

H4a: Autonomy when teleworking will have a positive relationship with experienced telework distress.
H4b: Autonomy when teleworking will have a positive relationship with experienced telework eustress.

Immediate Effects to Long-term Effects

As discussed above, the stress appraisal process leads to both immediate and long-term effects. In this study, we position experienced distress and experienced eustress as immediate effects, which we expect to affect two long-term effects, satisfaction and telework exhaustion.

We treat satisfaction as a composite of job satisfaction and telework satisfaction. In this way, satisfaction represents a worker’s overall evaluation of the extent to which their telework-based job situation is fulfilling (Venkatesh & Morris, 2000). Prior studies of teleworkers suggested that job satisfaction is one of the most frequent outcomes that are affected by family disruption and work-life conflict (Fonner & Roloff, 2010; Pinsoneault & Boisvert, 2001). However, findings related to telework and job satisfaction are somewhat ambiguous (Golden & Veiga, 2005; Suh & Lee, 2017). Some empirical studies suggest that teleworkers are more satisfied than their non-teleworking coworkers because teleworkers have greater autonomy and control over when and how they complete work tasks (Allen et al., 2015; Gajendran & Harrison, 2007). These factors allow teleworkers to better manage some of the demands of work, including managing stressors such as distractions and interruptions. However, other research indicates that social isolation may strain coworker and manager relationships, leading to reduced teleworkers’ satisfaction (Golden & Veiga, 2005). Other research has found that stress negatively affects job satisfaction (Avey et al., 2011; Babin & Boles, 1996; Bentley et al., 2016; Suh & Lee, 2017; Weinert et al., 2014). Considering the roles of telework distress and eustress may help resolve some of the conflicting results related to satisfaction and telework. When telework results in distress, satisfaction should be reduced, but satisfaction is likely to increase when telework brings about eustress. This thinking is reflected in H5a, and H6a.

H5a: Experienced telework distress will have a negative relationship with satisfaction.
H6a: Experienced telework eustress will have a positive relationship with satisfaction.

We also expect distress and eustress to impact telework exhaustion, which we define as a feeling that the resources at one’s disposal are inadequate for meeting job demands while teleworking (Ayyagari et al., 2011). Exhaustion can be distinguished from stress in that stress can cause exhaustion, so stress may be a precursor to exhaustion (Glise, Wiegner, Jonsdottir, 2020). Exhaustion is a more holistic feeling than work overload, which is focused on work tasks. Unfortunately, few studies have studied exhaustion in the context of telework (Sardeshmukh et al., 2012), despite its importance to telework (Golden 2012). When workers believe that their resources are sufficient to meet demands, they are likely to experience distress, and subsequently, exhaustion (Avey et al., 2011; Bakker &
Demerouti, 2007, 2017). Empirical research indicates that job resources and personal resources lower exhaustion (Van den Broeck et al., 2010; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007), while job demands and distress (Ayyagari et al., 2011; Weinert, Maier, & Laumer, 2015) are positively related to exhaustion. In addition, empirical evidence has found a positive relationship between exhaustion and numerous environmental factors including autonomy, work overload, and work-home conflict (Ahuja et al., 2007; Ayyagari et al., 2011; Maier et al., 2015; Weinert et al., 2014). It is possible that these effects are mediated by distress and eustress, as indicated by the transactional model. It is likely that negative stress (distress) will have a positive influence on telework exhaustion, while eustress will have a negative effect, as stated in the following hypotheses.

H5b: Experienced telework distress will have a positive relationship with telework exhaustion.  
H6b: Experienced telework eustress will have a negative relationship with telework exhaustion.

The next section describes the method by which we evaluated the model and the results of that evaluation.

METHOD AND RESULTS

We applied the convenience sampling method to collect our survey data. We believed that distributing our survey to Chinese adult teleworkers who are currently enrolled in a MBA program at a Chinese university and asked their telework experience to meet the purpose of the study, which is investigating factors to understand Chinese workers’ psychological responses in the context of telework. 521 individuals were invited to participate. We received 340 usable responses for a response rate of 65%. As Etikan, Musa, & Alkassim (2016) pointed out, outliers could be a problem of convenience sampling. In order to overcome this potential issue of convenience sampling, which is a self-selection possibility, we performed an outlier analysis and removed outliers that may be influential. The outlier analysis performed based on latent variable scores and identified eleven outliers. Analysis of leverage values indicated that these outliers may be influential. So, as a cautionary measure, we deleted the outlier values from the data set before performing the rest of our analysis. Our final sample size was 329.

Table 2 provides demographic characteristics of the sample. The mean age for the sample is 32.8 years, with the mean amount of work experience being 9.3 years. The sample is gender balanced, with 50.5% males. Most of the participants (71.4%) had not engaged in telework prior to the onset of the COVID-19 pandemic. The mean number of hours per week spent teleworking was 22.4, although there was substantial variability (standard deviation of 17.9 hours per week). The mean amount of telework experience was 9.7 months; again, there was substantial variability (standard deviation of 31.9 months). The relatively large standard deviations for work experience and telework hours indicates that our sample includes a diverse range of Chinese teleworkers.
The survey was comprised of previously validated scales that were adapted for the context of this study. The survey was pilot tested with a sample that did not overlap with the sample discussed above. With the exception of demographic items, scale items used seven-point Likert-type scales. Scale items were subjected to a translation-backtranslation process which were completed by non-authors. The translations were verified by an author with bi-lingual fluency. See Appendix A for scale items and sources.

Measurement Model Results

We used Partial Least Squares Structural Equation Modeling (PLS-SEM) as implemented in SmartPLS 3.0 (Ringle, Wende, & Becker, 2015) to analyze measurement and structural models that were drawn from our research model and scales. PLS-SEM, which is widely used in information systems research (Gefen et al., 2011; Ringle et al., 2012) is an appropriate method when the focus is on identifying constructs that affect outcome constructs of interest, as is the case for our research (Hair et al., 2017). (Such constructs are sometimes known as “driver” constructs.) Because our interest is in explaining variance in the outcome variables in our model rather than assessing the fit of a model to our particular data set, PLS-SEM is a more appropriate choice than Covariance-Based Structural Equation Modeling, which focuses on fit. In addition, PLS-SEM is useful for examining complex structural models (Lee et al., 2011), such as that presented in Figure 1. Further, PLS-SEM requires assumptions regarding data distribution (Lee et al., 2011; Hair et al., 2017) and is flexible with respect to data types in that it can accommodate quasi-metric data such as Likert-type scale data, as well as categorical data such as gender data (Hair et al., 2017). Although PLS-SEM does not require normal data, extreme deviations from normality can inflate standard errors, which will reduce statistical power (Hair et al., 2014). So, we examined of residual Q-Q plots for our data. No extreme deviations from normality were found.

Although one advantage of PLS-SEM is its ability to achieve high levels of statistical power with small sample sizes (Hair et al., 2017), it is still necessary to consider whether a study’s sample size is sufficient. Several different sample size criteria can be identified in the literature. One commonly-used heuristic is that the sample size should be, at a minimum, ten times the largest number of structural paths pointing towards a latent variable (Chin, 1998). Another recommendation is that there should be at least five observations per observed variable (Bentler & Chou, 1987). In our case, we have 39 observed variables, so the minimum recommended sample size is 195. Hair et al. (2017) provide a power table that indicates that a sample of 169 is required to detect a small $R^2$ (0.10), using a significance level of 0.01. Our sample of 329 (after removing outliers) well-exceeds even the most stringent of these criteria, indicating that our sample provides sufficient power for analyzing our research model.

Table 2. Sample Descriptive Statistics

| Characteristic               | Mean or Frequency | Standard Deviation |
|------------------------------|-------------------|--------------------|
| Age (years)                  | 32.8              | 5.2                |
| Gender                       | Female – 163 (49.5%) Male – 166 (50.5%) |
| Telework prior to COVID-19   | Yes – 97 (28.5%)  No – 243 (71.5%) |
| Work experience (years)      | 9.3               | 5.0                |
| Telework hours per week      | 22.4              | 17.9               |
| Telework experience (months) | 9.7               | 31.9               |
Prior to running our main analysis, we analyzed a model that included telework mandatoriness, telework experience (in months) and the extent of telework (in hours per week) as antecedents of telework distress, eustress, satisfaction, and exhaustion. The paths from mandatoriness to distress and telework experience were marginally significant (p-values of 0.096 and 0.102 respectively), so we included these paths in our subsequent analysis.

The measurement model analysis found that all scale items had significant loadings to their intended latent variables (p < 0.001). In addition, examination of cross-loadings indicates all items loaded substantially more strongly on their intended latent variable than on any other latent variable. Results indicate acceptable reliability, convergent, and discriminant validity. Table 3 shows data for Cronbach’s alpha, composite reliability, and average variance explained (AVE) for each scale. Cronbach’s alpha and composite reliability for all scales are greater than the common minimum acceptable value of 0.70, indicating acceptable reliability. The AVE for all scales is greater than or equal to 0.50 indicating acceptable convergent validity.

Table 3. Reliability

| Scale                  | Cronbach’s Alpha | Composite Reliability | AVE  |
|------------------------|------------------|-----------------------|------|
| Autonomy               | 0.76             | 0.85                  | 0.58 |
| Distress               | 0.90             | 0.93                  | 0.72 |
| Eustress               | 0.74             | 0.84                  | 0.57 |
| Exhaustion             | 0.93             | 0.95                  | 0.82 |
| Resilience             | 0.84             | 0.89                  | 0.68 |
| Satisfaction           | 0.87             | 0.89                  | 0.67 |
| Work overload          | 0.79             | 0.87                  | 0.63 |
| Work-Family Conflict   | 0.73             | 0.84                  | 0.64 |

Note: AVE – Average variance explained

Table 4 provides data related to discriminant validity. In all cases, the square root of the AVE is greater than the largest associated inter-scale correlation, indicating discriminant validity.

Table 4. Discriminant Validity

|     | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1.  |     |     |     |     |     |     |     |     |
| 2.  |     |     |     |     |     |     |     |     |
| 3.  |     |     |     |     |     |     |     |     |
| 4.  |     |     |     |     |     |     |     |     |
| 5.  |     |     |     |     |     |     |     |     |
| 6.  |     |     |     |     |     |     |     |     |
| 7.  |     |     |     |     |     |     |     |     |
| 8.  |     |     |     |     |     |     |     |     |

Notes: Diagonal elements are the square root of the average variance explained. Off-diagonal elements are the inter-scale correlations.
We performed two tests for the presence of common method variance (CMV). We conducted a Harman’s single-factor test (Podsakoff et al., 2003) by performing an exploratory factor analysis consisting of all scale items and no rotation using the eigenvalue greater than one extraction method. This analysis yielded nine factors. The maximum variance explained by any single factor was 25.4%. These results indicate the absence of serious CMV. We also followed the procedure recommended by Lindell and Whitney (2001). (See Tehseen, Ramayah, & Sajilan (2017) for a brief overview of the method). We added to our model a marker variable, blue attitude (Miller & Chiodo, 2008), which theoretically has no expected relationship with the study’s constructs. We then re-ran the PLS procedure to generate correlations between the latent variables and the marker variable. No marker variable – latent variable correlation exceeded 0.30, indicating that CMV is not a serious issue. Having established the validity of our measures, we turn attention to results related to the structural model. We discuss these results in the next section.

**Structural Model Results**

Table 5 provides adjusted $R^2$ and $Q^2$ values for each of the endogenous latent variables in our model. Our model accounted for more of the variance in distress than eustress. Distress and eustress, in combination, accounted for a moderate amount of the variance in satisfaction and exhaustion. Given that our model included only two predictors of these outcome variables, the results for satisfaction and exhaustion are promising. $Q^2$ represents the predictive relevance of a set of predictors. When $Q^2$ is greater than zero, predictive relevance exists. Generally, the criteria for large, medium, and small $Q^2$ values are 0.35, 0.15, and 0.02 respectively (Hair et al., 2013). The predictive relevance for exhaustion is large and for distress and satisfaction are medium, while that for eustress is small, but approaching medium.

| Variable    | $R^2$-adjusted | $Q^2$  |
|-------------|----------------|--------|
| Distress    | 0.378          | 0.273  |
| Eustress    | 0.244          | 0.130  |
| Exhaustion  | 0.477          | 0.387  |
| Satisfaction| 0.242          | 0.156  |

Table 6 presents results related to the hypotheses derived from our research model. Results indicate overall support for the model, with twelve of fourteen hypotheses supported (at $p < 0.01$). The unsupported hypotheses was, H4a (autonomy to distress). To determine the effect of holding a management-level position on our results, we ran the model with only non-management participants ($n=287$), excluding 42 management-level participants. No meaningful differences were found between
this analysis and the results presented in Table 5. In the next section, we discuss these results, including their implications for research and practice.

Table 6. Structural Model Results

| Hypothesis/Path                  | Coefficient | t-statistic | p-value | Support |
|----------------------------------|-------------|-------------|---------|---------|
| H1a: Resilience -> Distress      | -0.251      | 5.696       | < 0.001 | Yes     |
| H1b: Resilience -> Eustress      | 0.435       | 9.147       | < 0.001 | Yes     |
| H2: Work-family conflict -> Distress | 0.307   | 6.446       | < 0.001 | Yes     |
| H3: Work overload -> Distress    | 0.342       | 7.067       | < 0.001 | Yes     |
| H4a: Autonomy -> Distress        | 0.067       | 1.116       | 0.264   | No      |
| H4b: Autonomy -> Eustress        | 0.146       | 2.749       | 0.006   | Yes     |
| H5a: Distress -> Satisfaction    | -0.234      | 4.735       | < 0.001 | Yes     |
| H5b: Distress -> Exhaustion      | 0.647       | 20.007      | < 0.001 | Yes     |
| H6a: Eustress -> Satisfaction    | 0.429       | 8.847       | < 0.001 | Yes     |
| H6b: Eustress -> Exhaustion      | -0.220      | 5.643       | < 0.001 | Yes     |
| Control: Mandatoriness -> Distress | 0.074  | 1.687       | 0.092   | N/A     |
| Control: Telework experience -> exhaustion | -0.066 | 1.704       | 0.089   | N/A     |

Table 7. Total Effects of Antecedent Variables on Outcomes

|                  | Exhaustion |                  | Satisfaction |                  |
|------------------|------------|------------------|---------------|------------------|
|                  | Total effect | p-value | Total effect | p-value |
| **Person antecedent** |             |         |               |         |
| Resilience       | -0.258     | < 0.001 | 0.246         | < 0.001 |
| **Environment antecedents** |         |         |               |         |
| Autonomy         | 0.011      | 0.682   | 0.049         | 0.101   |
| Work-family conflict | 0.199   | < 0.001 | -0.072        | < 0.001 |
| Work overload    | 0.222      | < 0.001 | -0.080        | < 0.001 |

Table 7 shows the total effects of the person and environment antecedents on telework outcomes. Based on our results, the personal antecedent has stronger effects than any of the environment antecedents. Resilience is associated with multiple benefits, including lower exhaustion (total effect = -0.258), and higher telework satisfaction (total effect = 0.246). In contrast, autonomy has weaker associations with telework outcomes, with no significant effect on exhaustion (total effect = 0.011, p = 0.682) or satisfaction (total effect = 0.049, p = 0.101), although the effect is borderline significant for satisfaction. Work-family conflict has significant relationships with exhaustion (total effect = 0.199) and satisfaction (total effect = -0.072). Work overload has similar results, with significant associations with exhaustion (total effect = 0.222) and satisfaction (total effect = -0.080).
As a post-hoc analysis, we performed mediation analysis for each antecedent to satisfaction and exhaustion. This analysis determines whether the effects of the antecedent on the long-term effects are partially or fully mediated by their effects on experienced telework distress and eustress. We followed the procedure recommended by Hair et al. (2017), which required adding direct paths from each antecedent to satisfaction and exhaustion. With the exception of the effect of autonomy on exhaustion, all indirect effects of the antecedents on satisfaction and exhaustion were significant ($p < 0.05$). Further, the paths from each of the antecedents to satisfaction and exhaustion were significant ($p < 0.01$). Since the indirect effects (with the exception of autonomy to exhaustion) and the direct effects were significant, we can conclude that the effects of the antecedents on satisfaction and exhaustion were partially mediated by experienced distress and/or eustress.

In this section, we presented our research methodology and findings. In the next section, interpret these results and discuss the implications of our study for research and practice.

**DISCUSSION**

Our results indicate general support for the research model, with all but one hypothesis (H4a) supported. This illustrates the utility of applying the transactional model of stress to telework. We found support for the association of both person and environment antecedents with immediate and long-term outcomes of stressful telework encounters. Interestingly, the person antecedent we included, resilience, had the strongest relationships with each of the long-term outcomes. The results were not as strong with respect to environment antecedents, although work-family conflict and work overload had clear significant effects on exhaustion, and satisfaction. Autonomy, which has long been claimed as a benefit of telework, had weak effects on satisfaction, but no effect on exhaustion.

We can also infer that resilience and autonomy are associated with challenge appraisals due to their significant relationships with experienced telework eustress, and that work-family conflict and work overload are related to threat appraisals, based on their relationships with experienced telework distress. Also, resilience seems to be associated with reduced threat appraisals. Given the attention autonomy has received in the telework literature, we were surprised to find that autonomy had no significant relationship with distress, indicating that autonomy does not serve to reduce threat appraisals.

The immediate effects of secondary appraisals (telework distress and eustress) are clearly associated with long-term effects, as predicted by the transactional model. Experienced telework distress is associated with increased exhaustion and decreased satisfaction. The relationship with exhaustion was quite strong (0.632), indicating that distress plays an important role in telework exhaustion. This is an important finding due to the effect of exhaustion on undesirable organizational outcomes such as turnover intentions (Lapointe, Vandenberghhe, & Panaccio, 2011; Moore, 2000; Wright & Cropanzano, 1998).

This brings up one of the most interesting aspects of our findings – the predictions made by our adaptation of the transaction model largely held, despite the relatively unique time and place of our study. This indicates that the transactional model, and by extension, our research model, offer robust ways to view telework stress. This is as a useful contribution to the telework literature. Below we discuss further research contributions of our work.

**Contributions to Research**

In addition to providing a robust model of telework stress, we contribute to scholarly conversations in several areas. First, we offer a potential explanation for the telework paradox (Gajendran & Harrison, 2007). The question of whether telework is “good” or “bad” for teleworkers is, in some sense, the wrong question. A better question may be, “Under what conditions does telework lead to positive or negative outcomes for teleworkers?” There is a growing body of literature that takes this perspective (e.g. Weinert et al., 2014). One way to address this question is to consider the effects of
specific person and environment antecedents. For example, when a teleworker’s workload exceeds their capacity, they are likely to experience distress, leading to “bad” outcomes. However, when a teleworker is resilient, we should expect less experienced distress, more experienced eustress, and better outcomes. Future research may consider how other person factors, or even combinations of person factors, influence stress appraisals.

Some prior research into telework and stress views telework as leading to positive stress-related outcomes due to increased feelings of control (e.g. Allen et al., 2015), while other researchers conclude that working from home increases distress (e.g. Song & Gao, 2018). We offer a way of potentially reconciling these views by introducing the concept of secondary appraisals and their immediate and long-term effects. This allows researchers to consider a causal chain of person-environment antecedents leading to appraisals, which then lead to immediate and long-term outcomes. In addition, we demonstrate the efficacy of considering experienced telework eustress, in addition to distress. Although eustress has been studied in numerous domains, it remains understudied in telework research.

There is extensive research using JD-R, and the transactional model has been widely utilized, but to our knowledge there is no prior research that merges the two in order to investigate telework stress. Our model and theorizing blend these two influential models to offer a relatively unique view of telework stress. Thus, our model provides a unique, theoretically grounded way for future investigations of telework stress. For example, other job demands and resources could be applied to our model, and personal resources could be utilized as person antecedents. Researchers should consider which antecedents are most interesting in their contexts.

Our model also provides a useful starting point for investigating other important telework outcomes such as turnover and continuance intentions. In addition, our model could be modified to investigate phenomena that involve technology-mediated distant relationships, such as virtual teams and distance learning.

We also contribute by establishing that the important concept of eustress in the context of China. Although there were no a priori reasons to expect eustress to be unimportant to Chinese workers, there are few studies of eustress in the Chinese context, despite the growing concern about the role of stress among Chinese workers (Wang, Huang, Davison, & Yang, 2020). To our knowledge, our study is the first to examine telework eustress among Chinese teleworkers. Given concerns regarding the effects of stress on Chinese workers, and the growing presence of telework in China, better understanding the role of stress, especially eustress, is important, as is understanding factors that lead to telework distress and eustress. This is especially important because telework runs counter to many Chinese work and cultural norms. For example, our findings related to work-family conflict are particularly interesting in light of Chinese workers’ view that being absent from the workplace is a neglect of duty, which may clash with Chinese cultural norms that value time spent with family.

It is important to reiterate that our research was conducted during a pandemic that has had tremendous effects on the world and the nature of work. In alignment with the slow uptake of telework in China, our sample consisted primarily of inexperienced teleworkers, most of whom had no telework experience, and most of whom had very little notice before being mandated to telework. It is possible that these contextual factors magnified some of the relationships found in our study. In addition, the high-context nature of Chinese culture and other aspects of the environment in China, such as work intensification, top-down autocratic leadership, and collectivism may have increased the uncertainties associated with telework due to the lower availability of non-verbal cues. Of course, additional research is necessary to investigate the effects of these factors in more depth, for example by applying our model to other contexts and comparing the results. Regardless, our research adds new findings to a growing body of research interested in studying the effects of telework mandated by disruptive events (e.g. Carillo et al., 2020; Chong et al., 2020).

Our results failed to confirm one hypothesis, H4a (autonomy to distress). Our hypothesis was based on our thinking that autonomy may bring about potentially-distressing ambiguity regarding how and when to perform work tasks. Our participants apparently either did not experience this
ambiguity or did not find the ambiguity to be distress inducing. To the contrary, based on the results for H4b (autonomy to eustress), our participants found autonomy favorable.

The results of our post-hoc analysis indicate that the antecedents’ effects on satisfaction and exhaustion were only partially mediated by experienced distress and eustress. This indicates that autonomy, resilience, work-family conflict, and work overload are important factors to consider, even if one is not interested in the effects of distress and eustress. For example, resilience may indicate an ability to deal with the uncertainties of an unfamiliar work environment. Similarly, work overload may represent a pragmatic issue in that the overload may simply lead to the employee feeling tired from the additional work, outside of the effects of work overload on stress. In addition, the finding of partial mediation indicates the potential existence of other mediators. Future research should consider and test other potential mediators, such as task or technology experimentation.

**Contributions to Practice**

Our findings clearly demonstrate the relationship between telework distress and telework outcomes, especially exhaustion. Managers should pay close attention to teleworkers levels of distress and when they are high or increasing, take measures to reduce distress levels. Our findings offer some potential managerial levers that may be useful. For example, managers may be able to reduce workloads when distress is running high; this should reduce distress levels. It may be more difficult to reduce work-family conflict, but managers may find it useful to monitor work-family conflict levels as a precursor to future distress and negative outcomes.

Our findings related to autonomy, work overload, and work-family conflict are important for managers of Chinese teleworkers to consider. As noted earlier, telework may represent a clash of obligations for Chinese teleworkers. Work and family obligations may conflict with one another when teleworking. For example, when a Chinese teleworker’s child needs help with homework during work hours, which value should prevail, work or family? If the teleworker is working outside normal work hours, one could argue that the family value should prevail, and the work value should prevail during work hours. Even if this is the case, the teleworker still needs to deal with the situation and potentially disappoint a child or manager, which may bring about work-family conflict. In addition, autonomy may conflict with China’s typical top-down, autocratic management style. These, and other factors mean that Chinese managers must think carefully about how their actions affect their teleworkers’ stress appraisals. The results of our research give managers a starting point for these considerations.

It is also important for managers of teleworkers to ensure that the workers have adequate resources for completing their work within reasonable work hours. If teleworkers feel overload with work, increased exhaustion and reduced satisfaction may result. Given that both of these factors are thought to affect turnover intentions, avoiding feelings of work overload is important not only from a humanistic perspective, but also from a pragmatic viewpoint. Note that reducing perceptions of work overload need not mean reducing actual workload. It may be a matter of providing additional resources, improving communication, or providing training that can help workers increase their skills or their ability to deal with telework’s challenges.

Helping teleworkers navigate work-family conflict is also important. For example, providing flexibility with respect to when work tasks are performed may help teleworkers “time shift” in a way that reduces work-family conflict and, in turn, increases satisfaction and decreases exhaustion. To further reduce potential for work-family conflict, and to lessen work overload, management should communicate clear, appropriate workload and work time policies to set expectations on what work should be performed, and when teleworkers are expected to work. This is especially important due to the prevalence for overwork among Chinese workers.

Our findings also show that a personal resource, resilience, is positively associated with eustress but negatively associated with distress. In addition, results of total effect of resilience on exhaustion and satisfaction show the important role of personal resilience in determining telework satisfaction and exhaustion; when an employee has high capacity to deal with challenging situations, satisfaction
should be increased, through the effect of resilience on eustress. Also, employees who have low levels of resilience, may experience increased distress, which, in turn, increases exhaustion. Based on the abovementioned results regarding resilience, we suggest that companies need to focus on providing more telework supporting programs to their employees such as educational resources, technical support and coaching. Such programs may help increase employees’ resilience because they know where they can obtain assistance when needed to deal with difficult situations. Ultimately, this helps both telework companies as well as employees.

**Limitations**

Because our study uses data collected from a single country, we cannot make claims about how the Chinese context might compare to others. As noted earlier, we believe that it would be useful for future studies to test our model in other cultures. It may also be useful to engage in multi-culture research that compares the model across cultures. For example, it may be instructive to compare Chinese teleworkers with teleworkers in the Western hemisphere. Future study is encouraged to examine the different effects of personal factors and work factors between Chinese teleworkers and Western hemisphere teleworkers since collectivism and power distance may have a potential impact on teleworkers’ satisfaction and performance.

In addition, we applied used convenience sampling to collect our sample data. Although this technique is widely used for quantitative studies, which are “intended to achieve a breadth of understanding” (Etikan et al., 2016, pp. 3), there is a possibility that our collected sample may not be able to represent the total population. Ultimately, it is possible to hinder for achieving the objective of quantitative study, which is extent understanding of the phenomena. In our future research, we plan to collect survey responses from multiple sources to overcome these weaknesses of the sampling method.

We also did not include all possible stressors or telework outcomes. It would be interesting to add other stressors to our model or substitute other stressors in our model. For example, it might be useful to examine self-efficacy, which is related to, but distinct from resilience. Another interesting stressor is role conflict, which is likely to have a positive relationship with distress. It may also be useful to investigate other telework outcomes, such as turnover intention (a negative outcome) and extra-role behavior or organizational commitment (positive outcomes).

In addition, we used a cross-sectional survey approach with single-point data collection, which limits our ability to make definitive claims about causality. Future longitudinal research may be able to strengthen our knowledge of the relationships in our model.

Finally, our study was done during the COVID-19 pandemic, which was a particularly stressful time in history. It is possible, even likely, that when life returns to normal, overall levels of distress will be lower. However, even when broader societal stresses are lower, it is reasonable to think that the relationships in our model will hold. Once the pandemic is in the past, it would be useful to validate our model in future research.

**CONCLUSION**

With the rapid rise in telework in response to the COVID-19 pandemic, it became increasingly important to understand how telework affects workers. In this study, we investigated two forms of emotional responses to telework-related stressors, eustress (beneficial stress), and distress (detrimental stress). Based on the relationships found in our research, eustress may have beneficial effects on telework outcomes by increasing satisfaction and by decreasing telework exhaustion. We further confirm that distress is negatively associated with telework satisfaction and is negatively associated with telework exhaustion. Our work also shows that personal and work-related factors have significant relationships with telework eustress and distress, although the relationships of individual factors in some cases vary between telework eustress and distress.
For some workers, telework in some form will become a permanent work arrangement. Therefore, it is important for managers to understand factors that impact telework eustress and distress, along with the variables that impact these forms of stress. Such understanding will help managers take steps to encourage eustress and mitigate distress in order to beneficially affect important telework outcomes. Doing so may help telework become an alternative work arrangement that is beneficial for workers and employers.

FUNDING AGENCY

The Open Access Processing fee for this article was covered in full by the authors.
REFERENCES

Ahuja, M. K., Chudoba, K. M., Kacmar, C. J., McKnight, D. H., & George, J. F. (2007). IT road warriors: Balancing work-family conflict, job autonomy, and work overload to mitigate turnover intentions. *Management Information Systems Quarterly*, 31(1), 1–17. doi:10.2307/25148778

Allen, T. D., Golden, T. D., & Shockley, K. M. (2015). How effective is telecommuting? Assessing the status of our scientific findings. *Psychological Science in the Public Interest*, 16(2), 40–68. doi:10.1177/1529100615593273 PMID:26403188

Avey, J. B., Reichard, R. J., Luthans, F., & Mhatre, K. H. (2011). Meta-analysis of the impact of positive psychological capital on employee attitudes, behaviors, and performance. *Human Resource Development Quarterly*, 22(2), 127–152. doi:10.1002/hrdq.20070

Ayyagari, R., Grover, V., & Purvis, R. (2011). Technostress: Technological antecedents and implications. *Management Information Systems Quarterly*, 35(4), 831–858. doi:10.2307/41409963

Babin, B. J., & Boles, J. S. (1996). The effects of perceived co-worker involvement and supervisor support on service provider role stress, performance and job satisfaction. *Journal of Retailing*, 72(1), 57–75. doi:10.1016/S0022-4359(96)90005-6

Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of Managerial Psychology*, 22(3), 309–328. doi:10.1108/02683940710733115

Bakker, A. B., & Demerouti, E. (2014). Job Demands–Resources theory. *Wellbeing: A Complete Reference Guide*, 1-28.

Bakker, A. B., & Demerouti, E. (2017). Job demands–resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology*, 22(3), 273–285. doi:10.1037/ocp0000056 PMID:27732008

Bélanger, F. (1999). Workers’ propensity to telecommute: An empirical study. *Information & Management*, 35(3), 139–153. doi:10.1016/S0378-7206(98)00091-3

Bélanger, F., Collins, R. W., & Cheney, P. H. (2001). Technology requirements and work group communication for telecommuters. *Information Systems Research*, 12(2), 155–176. doi:10.1287/isre.12.2.155.9695

Bentler, P. M., & Chou, C. P. (1987). Practical issues in structural modeling. *Sociological Methods & Research*, 16(1), 78–117. doi:10.1177/0049124187016001004

Bentley, T., Teo, S., McLeod, L., Tan, F., Bosua, R., & Gloet, M. (2016). The role of organisational support in teleworker wellbeing: A socio-technical systems approach. *Applied Ergonomics*, 52, 207–215. doi:10.1016/j.apergo.2015.07.019 PMID:26360212

Bloom, N., Liang, J., Roberts, J., & Ying, Z. J. (2015). Does working from home work? Evidence from a Chinese experiment. *The Quarterly Journal of Economics*, 130(1), 165–218. doi:10.1093/qje/qju032

Burns, A., Posey, C., Roberts, T. L., & Lowry, P. B. (2017). Examining the relationship of organizational insiders’ psychological capital with information security threat and coping appraisals. *Computers in Human Behavior*, 68, 190–209. doi:10.1016/j.chb.2016.11.018

Califf, C., Sarker, S., & Sarker, S. (2020). The Bright and Dark Sides of Technostress: A Mixed-Methods Study Involving Healthcare IT. *Management Information Systems Quarterly*, 44(2), 809–856. Advance online publication. doi:10.25300/MISQ/2020/14818

Carillo, K., Cachat-Rosset, G., Marsan, J., Saba, T., & Klarsfeld, A. (2021). Adjusting to epidemic-induced telework: Empirical insights from teleworkers in France. *European Journal of Information Systems*, 30(1), 69–88. doi:10.1080/0960085X.2020.1829512

Carman, K. G., & Nataraj, S. (2020). *American Life Panel Survey on Impacts of COVID-19: April 2020 Results.* Rand Corporation.

Charalampous, M., Grant, C. A., Tramontano, C., & Michailidis, E. (2019). Systematically reviewing remote e-workers’ well-being at work: A multidimensional approach. *European Journal of Work and Organizational Psychology*, 28(1), 51–73. doi:10.1080/1359432X.2018.1541886
Chen, Y. H., Wu, J. J., & Chung, Y. S. (2008). Cultural impact on trust: A comparison of virtual communities in China, Hong Kong, and Taiwan. *Journal of Global Information Technology Management, 11*(1), 28–48. doi:10.1080/1097198X.2008.10856460

Chin, W. W. (1998). Commentary: Issues and opinion on structural equation modeling. *MIS Quarterly*. https://www.jstor.org/stable/249674

Chong, S., Huang, Y., & Chang, C. H. D. (2020). Supporting interdependent telework employees: A moderated-mediation model linking daily COVID-19 task setbacks to next-day work withdrawal. *The Journal of Applied Psychology, 105*(12), 1408–1422. Advance online publication. doi:10.1037/00000843 PMID:33271029

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*(4), 385–396. doi:10.1037/2136404 PMID:6668417

Cooke, F. L., & Jing, X. (2009). Work-life balance in China: Sources of conflicts and coping strategies. *NHRD Network Journal, 2*(6), 18–28. doi:10.1177/0974173920090603

Cooper, C. L., Dewe, P. J., & O’Driscoll, M. P. (2001). *Organizational stress: A review and critique of theory, research, and applications*. SAGE Publications. doi:10.4135/9781452231235

Coutu, D. L. (2002). How resilience works. *Harvard Business Review, 80*(5), 46–56. Retrieved February 2021, from https://hbr.org/2002/05/how-resilience-works PMID:12024758

Crawford, E. R., LePine, J. A., & Rich, B. L. (2010). Linking job demands and resources to employee engagement and burnout: A theoretical extension and meta-analytic test. *The Journal of Applied Psychology, 95*(5), 834–848. doi:10.1037/a0019364 PMID:20836586

Deci, E. L., & Ryan, R. M. (2000). The” “what” and” “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227–268. doi:10.1207/S15327965PLI1104_01

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *The Journal of Applied Psychology, 86*(3), 499. doi:10.1037/0021-9010.86.3.499

Diller, H., Jeffrey, S., & Fiedler, M. (2016). Searching for the silver linings of techno-invasion. *Passauer Diskussionspapiere-Betriebswirtschaftliche Reihe, No. B-22-16, Universität Passau, Wirtschaftswissenschaftliche Fakultät*. http://hdl.handle.net/10419/179471

Edwards, J. R., & Cooper, C. L. (1988). The impacts of positive psychological states on physical health: A review and theoretical framework. *Social Science & Medicine, 27*(12), 1447–1459. doi:10.1016/0277-9536(88)90212-2 PMID:3070765

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics, 5*(1), 1–4. doi:10.11648/j.ajtstat.20160501.11

Fonner, K. L., & Roloff, M. E. (2010). Why teleworkers are more satisfied with their jobs than are office-based workers: When less contact is beneficial. *Journal of Applied Communication Research, 38*(4), 336–361. doi:10.1080/00909882.2010.513998

Fonner, K. L., & Roloff, M. E. (2012). Testing the connectivity paradox: Linking teleworkers’ communication media use to social presence, stress from interruptions, and organizational identification. *Communication Monographs, 79*(2), 205–231. doi:10.1080/03637751.2012.673000

Gajendran, R. S., & Harrison, D. A. (2007). The good, the bad, and the unknown about telecommuting: Meta-analysis of psychological mediators and individual consequences. *The Journal of Applied Psychology, 92*(6), 1524–1541. doi:10.1037/0021-9010.92.6.1524 PMID:18020794

Gefen, D., Rigdon, E. E., & Straub, D. (2011). Editor’s comments: An update and extension to SEM guidelines for administrative and social science research. *Management Information Systems Quarterly, 35*(2), iii–xiv. doi:10.2307/23044042

Glise, K., Wiegner, L., & Jonsdottir, I. H. (2020). Long-term follow-up of residual symptoms in patients treated for stress-related exhaustion. *BMC Psychology, 8*(1), 1–9. doi:10.1186/s40359-020-0395-8 PMID:32188513
Golden, T. D. (2006). Avoiding depletion in virtual work: Telework and the intervening impact of work exhaustion on commitment and turnover intentions. *Journal of Vocational Behavior, 69*(1), 176–187. doi:10.1016/j.jvb.2006.02.003

Golden, T. D. (2012). Altering the effects of work and family conflict on exhaustion: Telework during traditional and nontraditional work hours. *Journal of Business and Psychology, 27*(3), 255–269. doi:10.1007/s10869-011-9247-0

Golden, T. D., & Veiga, J. F. (2005). The impact of extent of telecommuting on job satisfaction: Resolving inconsistent findings. *Journal of Management, 31*(2), 301–318. doi:10.1177/0149206304271768

Hair, J. F. Jr, Ringle, C. M., & Sarstedt, M. (2013). Partial least squares structural equation modeling: Rigorous applications, better results and higher acceptance. *Long Range Planning, 46*(1-2), 1–12. doi:10.1016/j.lrp.2013.01.001

Hair, J. F. Jr, Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review, 26*(2), 106–121. doi:10.1108/EBR-10-2013-0128

Hair, J. F. Jr, Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2017). *Advanced issues in partial least squares structural equation modeling*. SAGE Publications.

Hargrove, M. B., Nelson, D. L., & Cooper, C. L. (2013). Generating eustress by challenging employees: Helping people savor their work. *Organizational Dynamics, 42*(1), 61–69. doi:10.1016/j.orgdyn.2012.12.008

Hornung, S., & Glaser, J. (2009). Home-based telecommuting and quality of life: Further evidence on an employee-oriented human resource practice. *Psychological Reports, 104*(2), 395–402. doi:10.2466/PR0.104.2.395-402 PMID:19610467

Hargrove, M. B., Nelson, D. L., & Cooper, C. L. (2013). Generating eustress by challenging employees: Helping people savor their work. *Organizational Dynamics, 42*(1), 61–69. doi:10.1016/j.orgdyn.2012.12.008

Hornung, S., & Glaser, J. (2009). Home-based telecommuting and quality of life: Further evidence on an employee-oriented human resource practice. *Psychological Reports, 104*(2), 395–402. doi:10.2466/PR0.104.2.395-402 PMID:19610467

Jiaxue, C. (2009). The analysis of tendency of transition from collectivism to individualism in China. *Cross-Cultural Communication, 5*(4), 42–50. doi:10.3968/j.ccc.1923670020090504.005

Jie, G. J., Foong, P. S., Yang, Y., Jiang, W., Chen, Y., Ying, X., & Perrault, S. (2022). *From 996 to 007: Challenges of Working from Home During the Epidemic in China*. arXiv preprint arXiv:2201.09045.

Koeske, G. F., & Koeske, R. D. (1993). A preliminary test of a stress-strain-outcome model for reconceptualizing the burnout phenomenon. *Journal of Social Service Research, 17*(3-4), 107–135. doi:10.1300/J079v17n03_06

Kompier, M. A., & Taris, T. W. (2005). Psychosocial risk factors and work-related stress: State of the art and issues for future research. In A. S. G. Antoniou & C. L. Cooper (Eds.), *Research Companion to Organizational Health Psychology* (Vol. 2, pp. 59–69). Edward Elgar Publishing Limited. doi:10.4337/9781845423308.00009

Lapointe, É., Vandenberghe, C., & Panaccio, A. (2011). Organizational commitment, organization-based self-esteem, emotional exhaustion and turnover: A conservation of resources perspective. *Human Relations, 64*(12), 1609–1631. doi:10.1177/0018726711424229

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer.

Lazarus, R. S., & Folkman, S. (1987). Transactional theory and research on emotions and coping. *European Journal of Personality, 1*(3), 141–169. doi:10.1002/per.2410010304

Lee, L., Petter, S., Fayard, D., & Robinson, S. (2011). On the use of partial least squares path modeling in accounting research. *International Journal of Accounting Information Systems, 12*(4), 305–328. doi:10.1016/j. accinf.2011.05.002

Li, W., Ardichvili, A., Maurer, M., Wentling, T., & Stuedemann, R. (2007). Impact of Chinese culture values on knowledge sharing through online communities of practice. *International Journal of Knowledge Management, 3*(3), 46–59. doi:10.4018/jkm.2007070103

Liang, L.-H. (2020). How COVID-19 led to a nationwide work-from-home experiment. *BBC*. Retrieved from https://www.bbc.com/worklife/article/20200309-coronavirus-covid-19-advice-chinas-work-at-home-experiment

Lindell, M. K., & Whitney, D. J. (2001). Accounting for common method variance in cross-sectional research designs. *The Journal of Applied Psychology, 86*(1), 114–121. doi:10.1037/0021-9010.86.1.114 PMID:11302223
Long, Z., Kuang, K., & Buzzanell, P. M. (2013). Legitimizing and elevating telework: Chinese constructions of a nonstandard work arrangement. *Journal of Business and Technical Communication, 27*(3), 243–262. doi:10.1177/1050651913479912

Luo, H. (2015a). *From workplace to anyplace: Telework in China: Based on a mixed method research*. Academic Press.

Luo, H. (2015b). Theorize the Impeditive Mechanism of Telework Adoption in China: Based on Grounded Theory Approach. *Journal of Japan Telework Society, 13*(2), 25–36.

Luthans, F., Avolio, B. J., Avey, J. B., & Norman, S. M. (2007). Positive psychological capital: Measurement and relationship with performance and satisfaction. *Personnel Psychology, 60*(3), 541–572. doi:10.1111/j.1744-6570.2007.00083.x

Luthans, F., Luthans, K. W., & Luthans, B. C. (2004). Positive psychological capital: Beyond human and social capital. *Business Horizons, 47*(1), 45–50. doi:10.1016/j.bushor.2003.11.007

Maier, C., Laumer, S., Weinert, C., & Weitzel, T. (2015). The effects of technostress and switching stress on discontinued use of social networking services: A study of Facebook use. *Information Systems Journal, 25*(3), 275–308. doi:10.1111/isj.12068

Mann, S., & Holdsworth, L. (2003). The psychological impact of teleworking: Stress, emotions and health. *New Technology, Work and Employment, 18*(3), 196–211. doi:10.1111/1468-005X.00121

Miller, B., & Chiodo, B. (2008). *Academic entitlement: Adapting the equity preference questionnaire for a university setting*. Paper presented at the Southern Management Association meeting, St. Pete Beach, FL.

Moore, J. E. (2000). One road to turnover: An examination of work exhaustion in technology professionals. *Management Information Systems Quarterly, 24*(1), 141–168. doi:10.2307/3250982

Morganson, V. J., Major, D. A., Oborn, K. L., Verive, J. M., & Heelan, M. P. (2010). Comparing telework locations and traditional work arrangements: Differences in work-life balance support, job satisfaction, and inclusion. *Journal of Managerial Psychology, 25*(6), 578–595. Advance online publication. doi:10.1108/02683941011056941

Nakrošienė, A., Bučiūnienė, I., & Goštautaitė, B. (2019). Working from home: Characteristics and outcomes of telework. *International Journal of Manpower, 40*(1), 87–101. doi:10.1108/IJM-07-2017-0172

Nelson, D. L. (2007). *Positive Organizational Behavior*. Sage Publications. doi:10.4135/9781446212752

O’Sullivan, G. (2011). The relationship between hope, eustress, self-efficacy, and life satisfaction among undergraduates. *Social Indicators Research, 101*(1), 155–172. doi:10.1007/s11205-010-9662-z

Ong, A. D., Bergeman, C. S., Bisconti, T. L., & Wallace, K. A. (2006). Psychological resilience, positive emotions, and successful adaptation to stress in later life. *Journal of Personality and Social Psychology, 91*(4), 730–749. doi:10.1037/0022-3514.91.4.730 PMID:17014296

Otsuka, S., Ishimaru, T., Nagata, M., Tateishi, S., Eguchi, H., Tsuji, M., & Fujino, Y. et al. (2021). A cross-sectional study of the mismatch between telecommuting preference and frequency associated with psychological distress among Japanese workers in the COVID-19 pandemic. *Journal of Occupational and Environmental Medicine, 63*(9), e636–e640.

Palvia, S., Aeron, P., Gupta, P., Mahapatra, D., Parida, R., Rosner, R., & Sindhi, S. (2018). Online education: Worldwide status, challenges, trends, and implications. *Journal of Global Information Technology Management, 21*(4), 233–241. doi:10.1080/1097198X.2018.1542262

Pinsonneault, A., & Boisvert, M. (2001). The Impacts of Telecommuting on Organizations and Individuals: A Review of the Literature. In N. Johnson (Ed.), *Telecommuting and Virtual Offices: Issues and Opportunities* (pp. 163–185). IGI Global. doi:10.4018/978-1-878289-79-7.ch010

Podsakoff, N. P., LePine, J. A., & LePine, M. A. (2007). Differential challenge stressor-hindrance stressor relationships with job attitudes, turnover intentions, turnover, and withdrawal behavior: A meta-analysis. *The Journal of Applied Psychology, 92*(2), 438–454. doi:10.1037/0021-9010.92.2.438 PMID:17371090
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. *The Journal of Applied Psychology, 88*(5), 879–903. doi:10.1037/0021-9010.88.5.879 PMID:14516251

Quick, J. C., Cooper, C. L., Gibbs, P. C., Little, L. M., & Nelson, D. L. (2010). Positive organizational behavior at work: International review of industrial and organizational psychology. In G. P. Hodgkinson & J. K. Ford (Eds.), *International review of industrial and organizational psychology* (Vol. 25, pp. 253–291). John Wiley & Sons, Inc. doi:10.1002/9780470666162.ch7

Quick, J. C., Quick, J. D., Nelson, D. L., & Hurrell, J. J. Jr. (1997). *Preventive Stress Management in Organizations.* American Psychological Association. (Original work published 1984)

Raghuram, S., & Fang, D. (2014). Telecommuting and the role of supervisory power in China. *Asia Pacific Journal of Management, 31*(2), 523–547. doi:10.1007/s10490-013-9360-x

Ringle, C. M., Sarstedt, M., & Straub, D. W. (2012). Editor’s comments: A critical look at the use of PLS-SEM in “MIS Quarterly”. *Management Information Systems Quarterly, iii-xiv.* Advance online publication. doi:10.2307/410402

Ringle, C. M., Wende, S., & Becker, J.-M. (2015). *SmartPLS 3.* Boenningstedt: SmartPLS. Retrieved from http://www.smartpls.com

Sardeshmukh, S. R., Sharma, D., & Golden, T. D. (2012). Impact of telework on exhaustion and job engagement: A job demands and job resources model. *New Technology, Work and Employment, 27*(3), 193–207. doi:10.1111/j.1468-005X.2012.00284.x

Selye, H. (1976). Stress Without Distress. Stress without Distress. In G. Serban (Ed.), *Psychopathology of Human Adaptation* (pp. 137–146). Springer US. doi:10.1007/978-1-468-42238-2_9

Simmons, B., & Nelson, D. (2007). Eustress at work: extending the holistic stress model. In D. L. Nelson & C. L. Cooper (Eds.), *Positive Organizational Behavior* (pp. 40–54). SAGE Publications. doi:10.4135/9781446212752

Simmons, B. L., & Nelson, D. L. (2001). Eustress at work: The relationship between hope and health in hospital nurses. *Health Care Management Review, 26*(4), 7–18. doi:10.1097/00004010-200110000-00002

Sinclair, R. R., Allen, T., Barber, L., Bergman, M., Britt, T., Butler, A., Ford, M., Hammer, L., Kath, L., Probst, T., & Yuan, Z. (2020). Occupational Health Science in the Time of COVID-19: Now more than Ever. *Occupational Health Science, 1–22.* doi:10.1007/s41542-020-00064-3

Song, Y., & Gao, J. (2020). Does telework stress employees out? A study on working at home and subjective wellbeing for wage/salary workers. *Journal of Happiness Studies, 21*(7), 2649–2668. doi:10.1007/s10902-019-00196-6

Sørebø, Ø., & Eikebrokk, T. R. (2008). Explaining IS continuance in environments where usage is mandatory. *Computers in Human Behavior, 24*(5), 2357–2371. doi:10.1016/j.chb.2008.02.011

Spector, P. E. (1986). Perceived control by employees: A meta-analysis of studies concerning autonomy and participation at work. *Human Relations, 39*(11), 1005–1016. doi:10.1177/001872678603901104

Stich, J.-F. (2020). A review of workplace stress in the virtual office. *Intelligent Buildings International, 12*(3), 1–13. doi:10.1080/17508975.2020.1759023

Suh, A., & Lee, J. (2017). Understanding teleworkers’ technostress and its influence on job satisfaction. *Internet Research, 27*(1), 140–159. doi:10.1108/IntR-06-2015-0181

Tarakad, M., Cooper, C. L., & Stich, J. F. (2017). The technostress trifecta-techno eustress, techno distress and design: Theoretical directions and an agenda for research. *Information Systems Journal, 29*(1), 6–42. doi:10.1111/isj.12169

Teheseen, S., Ramayah, T., & Sajilan, S. (2017). Testing and controlling for common method variance: A review of available methods. *Journal of Management Sciences, 4*(2), 142–168. doi:10.20547/jms.2014.1704202

Van den Broeck, A., De Cuyper, N., De Witte, H., & Vansteenkiste, M. (2010). Not all job demands are equal: Differentiating job hindrances and job challenges in the Job Demands–Resources model. *European Journal of Work and Organizational Psychology, 19*(6), 735–759. doi:10.1080/13594320903223839
Van Slyke, C., Lee, J., Duong, B. Q., & Ellis, T. S. (2022). Eustress and Distress in the Context of Telework. *Information Resources Management Journal, 35*(1), 1–24. doi:10.4018/IRMJ.291526

Venkatesh, V., & Morris, M. G. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *Management Information Systems Quarterly, 24*(1), 115–139. doi:10.2307/3250981

Virick, M., DaSilva, N., & Arrington, K. (2010). Moderators of the curvilinear relation between extent of telecommuting and job and life satisfaction: The role of performance outcome orientation and worker type. *Human Relations, 63*(1), 137–154. doi:10.1177/0018726709349198

Wang, Y., Huang, Q., Davison, R. M., & Yang, F. (2020). Role Stressors, Job Satisfaction, and Employee Creativity: The Cross-level Moderating Role of Social Media Use within Teams. *Information & Management, 58*(3), 1–13. doi:10.1016/j.im.2020.103317

Weinert, C., Maier, C., & Laumer, S. (2015). *Why are teleworkers stressed? An empirical analysis of the causes of telework-enabled stress.* Paper presented at the Wirtschaftsinformatik. https://aisel.aisnet.org/wi2015/94

Weinert, C., Maier, C., Laumer, S., & Weitzel, T. (2014). Does teleworking negatively influence IT professionals? An empirical analysis of IT personnel’s telework-enabled stress. *Proceedings of the 52nd ACM conference on Computers and People Research.* doi: doi:10.1145/2599990.2600011

Westfall, R. D. (1997). The telecommuting paradox. *Information Systems Management, 14*(4), 15–20. doi:10.1080/10580539708907070

Wright, T. A., & Cropanzano, R. (1998). Emotional exhaustion as a predictor of job performance and voluntary turnover. *The Journal of Applied Psychology, 83*(3), 486–493. doi:10.1037/0021-9010.83.3.486

Xanthopoulou, D., Bakker, A. B., Demerouti, E., & Schaufeli, W. B. (2007). The role of personal resources in the job demands-resources model. *International Journal of Stress Management, 14*(2), 121. doi:10.1037/1072-5245.14.2.121

ENDNOTES

1 For example, the individuals in our sample had a median of three days’ notice before moving to telework.

2 We refer to the these as experienced telework distress and experienced telework eustress.

3 The process of coping can also play a role in these effects, but we are interested in the effects of the appraisal processes here.

4 In this paper, we are interested in the effects of work-family conflict rather than whether telework increases or decreases work-family conflict.

5 Although this is a convenience sample, because the participants were actively engaged in telework, they are within the scope of the population of interest. Further, because they were actively teleworking, survey questions were relevant and responding was within their experiences.

6 We compared results with and without the outlier observations. Although path coefficient and p-values differed with and without the outliers, there were no differences with respect to significance.

7 Q² was calculated by SmartPLS 3.0 using a blindfolding technique with nine folds.

8 Because the secondary appraisal process is not directly observable, we need to rely on inference based on the transactional model.
## APPENDIX A – SCALE ITEMS AND SOURCES

### Table 8. Scale items and sources

| Scale         | Item                                                                 | Source                                      |
|---------------|----------------------------------------------------------------------|---------------------------------------------|
| Autonomy      | I have control over the content of my job.                           | Ahuja et al. (2007)                         |
|               | I have a lot of freedom to decide how I perform assigned tasks.     |                                             |
|               | I set my own schedule for completing assigned tasks.                |                                             |
|               | I have the authority to initiate projects at my work.               |                                             |
| Exhaustion    | I feel drained from my telework activities.                         | Suh & Lee (2017), adapted from Ayyagari et al. (2011) |
|               | I feel tired from my telework activities.                           |                                             |
|               | Teleworking all day is a strain for me.                             |                                             |
|               | I feel burned out from my telework activities                      |                                             |
| Resilience    | I usually manage difficulties one way or another at work.           | Burns et al. (2017)                         |
|               | I usually take stressful things at work in stride.                 |                                             |
|               | I can get through difficult times at work because I’ve experienced difficulty before. |                     |
|               | I feel I can handle many things at a time at this job.             |                                             |
| Satisfaction  | Overall, I am satisfied with my job.                                | Morris & Venkatesh (2011)                   |
|               | I am satisfied with the important aspects of my job.                |                                             |
|               | All things considered, how satisfied are you with your current job? | Fonner & Roloff (2010)                      |
|               | 1 (“not at all satisfied’) to 7 (“completely satisfied’”)          |                                             |
|               | In general, how much do you like your job?                         | Fonner & Roloff (2010)                      |
|               | 1 (“not at all”) to 7 (“a great deal”)                             |                                             |
|               | How do you feel about your overall experience of telework?         | (Sørebø & Eikebrokk, 2008)                 |
|               | Very dissatisfied/very satisfied                                    |                                             |
|               | Very displeased/very pleased                                       |                                             |
|               | Very frustrated/very contented                                      |                                             |
| Telework distress | How often have you been upset because of something that happened unexpectedly while teleworking? (never, almost never, sometimes, fairly often, very often) | (Cohen, Kamarck, & Merremstein, 1983) (adapted) |
|               | While working from home how often have you felt nervous and “stressed”? |                                             |
|               | How often have you felt that you were unable to control the important things related to working from home? |                     |
Bao Q. Duong is an assistant professor in the Computer Information Systems Department at Appalachian State University. He earned a DBA degree at Louisiana Tech University and an MBA in Data Analytics at Missouri State University. His current research focuses on behavioral aspects of information technology, information privacy and security, organizational resources, and research methods. He is a member of the Association of Information Systems (AIS), and Special Interest Group on Information Security & Privacy (SIGSEC). He is also a member of the International Federation for Information Processing (IFIP) Working Group 8.11/11.13 (Information Systems Security Research), INFORMS, and Academy of Management. His works have been published in IRMJ, JSAIS, and Criminal Justice Review and conference proceedings at Americas’ Conference on Information Systems (AMCIS), Southern Management Association (SMA), Decision Sciences Institute (DSI), and Royal Bank International Research Seminar.

Xiangyang Ma is an Associate Professor of Marketing at College of Management and Economics, Tianjin University. He received his Ph.D. in Management Science and Engineering from School of Management, Tianjin University. His research interests include the brand building and development, consumers’ behavior in the virtual brand community, corporate culture and strategic CSR, entrepreneurial marketing and cultural and creative industry management. His work has been published in Resources Science, Industrial Engineering and Management, Management Review in China, among others. Acknowledgments: Research on the mechanical effect of cultural identity and regional brand equity on the consumer’s purchase behavior and the evaluation, Project supported by National Natural Science Foundation of China (Grant No. 71272149), 01/01/2012-12/31/2016.

| Scale                      | Item                                                                 | Source                                      |
|----------------------------|----------------------------------------------------------------------|---------------------------------------------|
|                            | How often have you felt that difficulties related to working at home were piling up so high that you could not overcome them? |                                             |
|                            | While working from home, how often have you found that you could not cope with all of the things that you had to do?       |                                             |
| Telework eustress          | How often do you effectively cope with stressful changes that occur while teleworking?                                   | O’Sullivan (2011) (adapted)                 |
|                            | How often do you deal successfully with irritating telework hassles?                                                    |                                             |
|                            | How often do you feel that stress positively contributes to your ability to handle your telework problems?                |                                             |
|                            | In general, how often do you feel motivated by your stress?                                                             |                                             |
|                            | In general, how often are you able to successfully control the irritations in your telework life?                         |                                             |
| Work overload              | Working at home creates many more requests, problems or complaints in my job than I expected.                           | Moore (2000); Ayyagari et al. (2011)       |
|                            | The amount of work I do interferes with how well it is done.                                                             |                                             |
|                            | I feel rushed when working at home.                                                                                     | Weinert & Maier (2014)                     |
|                            | I frequently feel pressured when working at home.                                                                     | Weinert & Maier (2014)                     |
| Work-family conflict       | Teleworking blurs boundaries between my job and my home life.                                                          | Ayyagari et al. (2011)                     |
|                            | Telework responsibilities create conflicts with my home responsibilities.                                                 |                                             |
|                            | I do not get everything done at home because I find myself completing job-related work due to telework.                   |                                             |