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Understanding work experience in epidemic-induced telecommuting: The roles of misfit, reactance, and collaborative technologies

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Abstract

In the management of the global COVID-19 pandemic, the mandated closure of workplaces and stay-at-home orders have forced workers to adapt to a prolonged period of unplanned telecommuting, which we term epidemic-induced telecommuting. Although epidemic-induced telecommuting has drastically altered how work is conducted, scant attention is being paid to this emerging work arrangement. To this end, we combine psychological reactance theory and person-environment fit theory to advance the concept of misfit between worker and environment as a core determinant of employees’ work experience in the epidemic-induced telecommuting. Particularly, we distinguish between supply-value and demand-ability misfits as constraints on workers’ freedom at work. Having analyzed data collected through a survey administered on remote workers, we discovered that both misfits positively influenced workers’ perceived psychological reactance, which led to work exhaustion and counter-productive behaviors. We also found that the utilization of collaborative technologies moderated the effects of misfit on workers’ psychological reactance.

1. Introduction

To stem the spread of COVID-19, governments worldwide have imposed or are imposing containment measures in the likes of lockdowns, public quarantines, and travel bans. By April 2020, over 3.9 billion people globally had been placed under varying forms of movement restriction, accounting for half of the world’s population. As a consequence of these social confinement measures, organizations and their employees went into a prolonged period of mandated telecommuting. According to a survey in the United States (US), 35.2% of the respondents reported that they worked entirely from home in May 2020, following the outbreak of COVID-19, whereas only 8.2% of the respondents reported doing so in February 2020, before the outbreak.

Telecommuting denotes work arrangements whereby employees conduct work activities in places other than their primary workplace. Even though telecommuting is commonly associated with benefits such as enhanced flexibility and improved work-life balance, the same may not hold true for epidemic-induced telecommuting due to its mandated and unplanned nature, affecting workers on a massive scale and lasting for a prolonged period with no end in sight. Epidemic-induced telecommuting differs from its conventional counterpart in that compulsory home confinement renders teleworking a “mandatory full-time practice.” During epidemics, telecommuting can no longer be viewed as a form of flexible work arrangement. Immediately and unexpectedly, employees are compelled to work from home and increasingly rely on digital technologies for work purposes, which in turn may culminate in unprecedented challenges for individuals and organizations.

Keywords:
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in turn calls for future inquiries into the effects of such arrangements on workers’ performance and well-being. Past studies have primarily centered on the social impact of telecommuting in the workplace (Gajendran & Harrison, 2007), with limited attention paid to the consequences of prolonged periods of mandated, full-time telecommuting during COVID-19 or other pandemic lockdowns. To the best of our knowledge, Carillo et al.’s (2021) study on epidemic-induced telecommuting is the only scholarly attempt, to date, to elucidate how workers adjust to mandated telecommuting. Furthermore, while previous work has alluded to the challenges of COVID-19 lockdown on work activities, most tend to be descriptive, such that it is unclear as to whether the documented observations apply to workers generally (Galanti et al., 2021; Herath & Herath, 2020). Given the dearth of research on epidemic-induced telecommuting despite its pervasiveness, an in-depth appreciation of its effects on workers’ performance and well-being can allow proper interventions to be enacted in a purposeful and targeted manner.

Epidemic-induced telecommuting is distinct from its conventional counterpart because it is a mandatory, full-time practice that is applied on a grand scale and lasts for a prolonged period. These characteristics of epidemic-induced telecommuting cause an upheaval of employees’ personal and professional lives by constraining how work activities can be performed and disrupting long-standing work routines (Carillo et al., 2021). As documented by Cushman & Wakefield Echnixon, 78% of Romanian employees complained about a lack of freedom to socialize with colleagues when working remotely during COVID-19 lockdowns, while 50% felt a sense of reduced flexibility in work (Marica, 2021). Prior research suggests that organizational changes affecting work routines may restrict employees’ freedom and prompt reactance as a response (Nesterkin, 2013). Yet, limited scholarly attention has been devoted to comprehending the antecedents and consequences of the restricted freedom caused by epidemic-induced telecommuting. To bridge this knowledge gap, we subscribe to the psychological reactance theory as our overarching theoretical lens for illuminating the effects of epidemic-induced telecommuting on employees’ work experience.

Organizational change may culminate in a mismatch between current and past realities (Nesterkin, 2013). While prior research has leveraged the psychological reactance theory to explore the impact of such a mismatch on employees (Nesterkin, 2013), the theory, on its own, cannot account for the sources of mismatch that arises from epidemic-induced telecommuting. Consequently, we combine the psychological reactance theory with person–environment (P–E) fit theory—the latter having been applied widely in deciphering how a (mis)match between personal and environmental factors shapes work experience—to shed light on the constraints imposed by epidemic-induced telecommuting that inhibit employees’ freedom at work and produce psychological reactance. Particularly, we advance the concept of comparative misfit (henceforth referred to as misfit for short) to trace the erosion of the fit between a worker and their work environment, relative to pre-lockdown conditions, that is triggered by epidemic-induced telecommuting (Carnevale & Hatak, 2020). For example, a worker may have been satisfied with their engagement with co-workers under pre-COVID work conditions; however, prolonged periods of mandated telecommuting may restrict their contact with colleagues, leading to estranged relationships and feelings of isolation (Rosciano & Zappala, 2020). Similarly, a balanced work-family life before the COVID-19 outbreak may be ruined by epidemic-induced telecommuting because all family members may have to stay at home due to social confinement, blurring the boundaries between a worker’s personal and professional lives. Expanding on extant literature, we delineate between supply-value (S-V) and demand-ability (D-A) misfits as novel constraints that inhibit employees’ freedom at work relative to pre-COVID-19 conditions.

Moreover, as a by-product of prolonged periods of mandated telecommuting, collaborative technologies play increasingly pivotal roles in sustaining employees’ daily working activities (Carillo et al., 2021). While past studies have acknowledged collaborative technologies as being instrumental to telecommuting, there is limited knowledge on how the use of such technologies amplifies or mitigates the impact of the misfit caused by epidemic-induced telecommuting. Subscribing to the technology affordance perspective, which describes plausible actions that are enabled by technologies and has been widely embraced in prior research to comprehend the implications of technologies at work (Karahanna, Xu, Xu, & Zhang, 2018; Leidner, Gonzalez, & Koch, 2018), we posit that the relative use of collaborative technologies during epidemic-induced telecommuting could moderate the effects of S-V and D-A misfits on employees’ freedom at work. Taken together, we endeavor to answer the following research questions:

1. How do P-E misfits affect employees’ freedom at work and eventually their work experience in epidemic-induced telecommuting?
2. How does the use of collaborative technologies mitigate the impact of P-E misfits on employees’ freedom at work in epidemic-induced telecommuting?

Findings from this study contribute to extant literature on four fronts: First, we extend previous work on P-E fit theory by advancing the concept of misfit to capture environmental disruptions that accompany epidemic-induced telecommuting during lockdowns. This study is among the first to conceptualize and validate P-E misfits as sources of mismatch that threaten employees’ freedom during epidemic-induced telecommuting. Second, we further distinguish between S-V and D-A misfits—each comprising four constituent sub-dimensions reflecting misfits along the vocational, spatial, temporal, and social aspects of work—as constraints that inhibit employees’ freedom at work for epidemic-induced telecommuting. This in turn affords us a systematic understanding of the environmental disruptions encountered by workers due to epidemic-induced telecommuting. Third, we conceptualize misfit in comparative terms to exemplify the discrepancy in workers’ assessment of their fit with the work environment relative to pre-COVID conditions. This will eliminate individual baseline differences in bringing forth the effects of epidemic-induced telecommuting on workers’ performance and well-being that arise from an erosion of P-E fit in workplace settings. Last, while a handful of studies on telecommuting have attested to the criticality of digital technologies, most have accentuated the direct impact of such technologies on employee outcomes in volitional contexts. Departing from previous work, we derive a meaningful use of collaborative technologies in epidemic-induced telecommuting and examine the extent to which such patterns of usage can moderate the effects of P-E misfit in workplace settings, thereby enriching research on telecommuting. In addition to the preceding theoretical contributions, insights from this study can also inform practitioners on how to cope with emerging challenges associated with new work arrangements that stem from epidemic-induced telecommuting.

The remainder of the paper is organized as follows: The next section reviews relevant extant literature, introduces our theoretical lens, and formulates testable hypotheses. Thereafter, we outline our research design and methodological procedures. We then report the results from our data analysis before discussing how our empirical findings bear implications for theory and practice. We conclude by highlighting the limitations of our study from which future avenues for research could spawn.

2. Theoretical foundation & hypothesis development

2.1. Lockdown and epidemic-induced telecommuting

Epidemics such as the COVID-19 pandemic may seriously affect people’s physical health and emotional balance (Fouques et al., 2021). An efficient way of halting viral transmission and controlling the epidemic is to isolate people via a lockdown (Atalan, 2020; Fouques...
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As pointed out by Venkatesh (2020), work changes and outcomes in lockdown are focal issues to be studied in future research.

Table 1 summarizes the focal characteristics of epidemic-induced and conventional telecommuting. As illustrated in Table 1, distinct from a conventional telecommuting arrangement, epidemic-induced telecommuting is often unplanned and mandatory, requires full-time working, affects many employees within and across organizations, and may last for a prolonged period. It is also accompanied by other epidemic-related changes in individuals’ daily routines. The unexpected and enforced changes in work arrangement and environment interrupt employees’ work routines and constrain their work activities. Thus, the accumulated knowledge on telecommuting may not be applicable to epidemic-induced telecommuting, thus requiring further investigation of telecommuting in the context of the epidemic.

As a lockdown is often associated with loss of freedom (Venkatesh, 2020), we attempt to focus on the role of increased work constraints in epidemic-induced telecommuting and rely on the psychological

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**Table 1**

Comparison of conventional and epidemic-induced telework.

| Characteristic | Conventional Telework | Epidemic-Induced Telework |
|---------------|-----------------------|----------------------------|
| Vocational    | Telework is conventional and designed to fit in with the original job task. Choice of technological communicating approach is strategic. | Job features must be changed to adapt to the telework. Use of technological communicating approach is mandatory. |
| Temporal      | Working hours are flexible for both telework and onsite work. The choice of telework period is normally beneficial for employees’ efficiency. | Only some working hours are flexible, with the constraints of simultaneously working with co-workers, as employees are assumed to be online during working hours. |
| Spatial       | Flexible workplace: At home, hotel, or any other places. | Mandatory, at home due to lockdown. |
| Social        | Voluntary employee participation in telework, not necessarily all employees. Communication environment is mostly well prepared, with the benefits of telework. | Mandatory for all employees to participate in telework. Sudden, without preparation time for employees, co-workers, and managers. |
|               | Employees have stable health statuses. Collaborative technologies are used with professional support. Children at school. | Health concerns among employees may increase social anxiety. Collaborative technologies are mostly used with limited professional or remote support. Children at home. |

Epidemic-induced telecommuting is one salient work-related consequence of a lockdown. Telecommuting, also known as telework or remote-working, can be defined as a work arrangement whereby individuals perform work activities in places other than their primary workplace (Gajendran & Harrison, 2007). During the COVID-19 outbreak, many organizations and employees were forced to adopt telecommuting due to the containment measures that were imposed by governments. Prior research has found that telecommuting facilitates social distancing during epidemics such as the COVID-19 outbreak (Kawashima et al., 2021). However, epidemic-induced telecommuting may bring many challenges. Telecommuting itself is not simply a change of work locations; instead, it is associated with changes in the nature of tasks, work arrangement, and interpersonal engagements (Mahler, 2012). Moreover, because most organizations are not well prepared for operating fully virtually (Jamal et al., 2021), epidemic-induced telecommuting tends to bring about drastic changes in the work environment, constraining work activities and interrupting people’s work routines.

Prior studies have mostly investigated work experience in conventional telecommuting, which is offered expectedly, voluntarily, and/or temporarily (Jamal et al., 2021; Pearlson & Saunders, 2001). Traditionally, telecommuting has been considered as leading to positive outcomes and benefits for organizations and employees (Gajendran & Harrison, 2007). On the organizational level, some academic research and company statistics have suggested that the deployment of telecommuting can reduce operation costs (e.g., Gajendran & Harrison, 2007; Morgan, 2004). On the individual level, prior studies have argued that telecommuting can benefit employees in terms of increased flexibility in work and life, improved satisfaction, and increased productivity (Gajendran & Harrison, 2007).

The extensive, worldwide lockdowns caused by the COVID-19 outbreak attracted the attention of academia to epidemic-induced telecommuting. For example, Belzunegui-Eraso and Erro-Garcés (2020) explored how to implement telecommuting in organizations to ensure employees’ safety and provide continuity to economic activity during the COVID-19 crisis. Kawashima et al. (2021) reported that telecommuting as a social distancing measure could help decrease employees’ fever rates. Bouziri et al. (2020) investigated the effects of telecommuting on employees’ well-being during the COVID-19 pandemic. Yang et al. (2020) demonstrated how information workers utilized telecommuting tools to implement work collaboration during the pandemic. However, prior studies on telecommuting during COVID-19 lockdown rely on existing knowledge of conventional telecommuting. While some previous studies have noted the challenges that epidemic-induced telecommuting may cause, such as the lack of face-to-face interaction due to social distancing and working in the presence of families due to home confinement (Jamal et al., 2021; Raitiene et al., 2020), few have theorized the constraints caused by these challenges at work. Therefore, there is a need for a systematic, theoretical framework for understanding employees’ work experience in epidemic-induced telecommuting.

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et al., 2021). Lockdown involves different levels of home confinement, travel and mobility restrictions, and closure of public places, academic institutions, and business organizations. Consequently, a lockdown tends to cause large-scale, mandated telecommuting for a prolonged period and is often accompanied by vast changes in work routines (Fouques et al., 2021; Jamal et al., 2021; Venkatesh, 2020). Previous studies have mostly examined the impact of a lockdown on people’s physical and mental health (Atalan, 2020; Fouques et al., 2021). Researchers have also sought to understand the social consequences of a lockdown, including how it shapes the public’s behavior, attitudes, and behaviors (Van Bavel et al., 2020). Meanwhile, increasing attention has been paid to the work-related consequences of a lockdown (Jamal et al., 2021). As pointed out by Venkatesh (2020), work changes and outcomes in lockdown are focal issues to be studied in future research.
reactance theory to capture employees’ perceived loss of freedom. Additionally, epidemic-induced telecommuting causes changes to employees’ work environment (Jamal et al., 2021), and such changes may disrupt the fit between an employee’s personal factors and the working environment. Therefore, we refer to P-E fit theory and derive S-V and D-A misfits to conceptualize the sources of work constraints in epidemic-induced telecommuting. Furthermore, given the importance of collaborative tools in telecommuting and the permeation of digital technologies in daily life during lockdown (Venkatesh, 2020), we also consider the moderating roles of collaborative technology use in the effect of P-E misfits on employees’ psychological reactance. An overview of the research framework is shown in Fig. 1.

2.2. Roles of psychological reactance

2.2.1. Psychological reactance theory: an overview

Psychological reactance theory originally proposed by Brehm in 1966, has been widely applied to explain people’s behaviors in the areas of information systems, marketing, and psychology (Brehm, 1966; Kavvouris et al., 2020; Kwon & Chung, 2010; Lee & Lee, 2009). The theory suggests that individuals tend to experience a motivational state to restore their freedom when it is being threatened or restricted (Ball & Wozniak, 2021; Brehm, 1966). Such a motivational state is referred to as psychological reactance, meaning the desire to reinstate the threatened or restricted freedom in thought and behavior.

One important antecedent of psychological reactance is a threat to freedom, which can be defined as the force that could potentially make it more difficult for individuals to exercise their freedom (Akhtar et al., 2020). Thus, a perceived threat to freedom or loss of freedom is often used as a cognitive measure of psychological reactance (Dillard & Shen, 2005; Rosenberg & Siegel, 2018). One may perceive a threat to freedom and experience a loss of freedom when their autonomy and free will are restricted by certain factors (Ball & Wozniak, 2021). Such a threat subsequently triggers reactance, while different types and strengths of threats to freedom may lead to different degrees of reactance (Ball & Wozniak, 2021). The psychological reactance theory posits that, upon experiencing reactance, individuals naturally seek to restore their autonomy and sense of freedom (Nesterkin, 2013).

To cope with the COVID-19 pandemic, many employees were forced to adapt to a prolonged period of mandated telecommuting. Challenges caused by COVID-19 lockdown and epidemic-induced telecommuting create changes in and restrictions on employees’ work environments and routines. Prior research suggests that environmental and organizational changes may lead to individual changes at work (George & Jones, 2001; Nesterkin, 2013). Nesterkin (2013) posits that the psychological reactance theory is a suitable theory to explain how individual employees react to changes in their work environment. As COVID-19 lockdown and epidemic-induced telecommuting bring changes to the work environment that often constraint individual work activities and threaten people’s freedom in work, we consider the psychological reactance theory to be appropriate for capturing the roles of work constraints in epidemic-induced telecommuting.

2.2.2. Effects of reactance on employee outcome

When an individual experiences a certain change, the freedom of acting in line with their beliefs and free will may be restricted or challenged, resulting in psychological reactance (Nesterkin, 2013). According to the psychological reactance theory, individuals in a reactance state are likely to engage in behaviors that are not allowed, harmful, or hostile to the prohibitor. Similarly, in the context of epidemic-induced telecommuting, the unexpected and mandated lockdown and telecommuting arrangements may cause changes to employees’ work environments and create discrepancies with employees’ pre-lockdown work norms. When employees experience such mandated changes, their freedom to act according to their free will and pre-lockdown work norms is likely to be constrained. Such loss of freedom may invade the cognitive territory and trigger a motivational state of reactance (Nesterkin, 2013), which tends to drive employees into negative responses and cause them to engage in reactance behaviors that generate adverse effects.

Based hereon, we expect that employees’ psychological reactance can drive counter-productive behaviors and work exhaustion. Counterproductive behavior is a core domain of individual job performance (Ramos-Villagrasa et al., 2019). It refers to the “voluntary behavior that harms the wellbeing of the organization” (Rotundo & Sackett, 2002, p. 69), such as complaining and purposely doing things wrong. In epidemic-induced telecommuting, employees may view organizations as responsible for creating disruptions at work and restricting their freedom, such as working from home in the presence of family members or working overtime. Thus, employees who perceive higher psychological reactance are likely to become hostile toward or disappointed with the organization, and consequently purposely harm the organization. Moreover, employees who experience reactance are aroused to restore their freedom (Clee & Wicklund, 1980). Employees in a high state of reactance would like to act in the direction opposite to that of the restriction. Yet under lockdown, it is often not feasible to do what is restricted, such as traveling; consequently, employees may engage in other behaviors that are not favored by the organizations to reassert their freedom, resulting in complaining, taking leave, incorrectly performing tasks on purpose, and other counter-productive behaviors. We therefore hypothesize the following:

Hypothesis 1. Psychological reactance is positively associated with counter-productive behaviors.

Work exhaustion reflects job burnout (Ahuja et al., 2007). It occurs “when employees feel overextended and drained by their work” (Kim & Wright, 2007, p. 147). Prior research suggests that organizational changes and a lack of autonomy contribute to work exhaustion (Moore, 2000; Petrou et al., 2015). Epidemic-induced telecommuting tends to cause organizational changes, while it also restricts employees’ freedom.
When they perceive a loss of freedom, employees are likely to experience a state of reactance, and may attempt to restore their freedom via a reluctance to follow required changes and may even behave in the opposite direction (Nesterkin, 2013). However, due to the containment measures in a pandemic, many changes in epidemic-induced telecommuting are necessary and inevitable, while reactance to required changes may result in inefficiency and ineffectiveness at work, which may cause employees to work over their limit of time and ability (Kim & Wright, 2007). Moreover, restricting employees’ freedom may also cause them to be emotionally vulnerable, which in turn reduces their tolerance ability and increase the likelihood of their feeling exhausted. In addition, prior research suggests that reactance also creates psychological tension, which could lead to overwhelming and exhaustion (Brehm, 1966; Molines, Akremi, Storme, & Celik, 2018). Conversely, employees who perceive a great loss of freedom and a high level of reactance are likely to experience work exhaustion. Based on the above, we hypothesize the following:

**Hypothesis 2. Psychological reactance is positively associated with work exhaustion.**

### 2.3. Roles of P-E misfit

Psychological reactance arises from a threat to freedom (Brehm, 1966; Nesterkin, 2013). Yet, what generates a threat to freedom? In this study, we propose to use the P-E misfit to conceptualize the environmental disruptions that constrain work freedom in epidemic-induced telecommuting.

#### 2.3.1. P-E fit Theory: An overview

P-E fit theory claims a fit when personal factors (e.g., needs, values, and abilities) are compatible with environmental factors (e.g., supplies and demands) (Caplan, 1987; Edwards & Rothbard, 1999; Wang et al., 2020). Generally, P-E fit refers to a match or congruence between a person and the corresponding environment (Edwards & Shipp, 2007). In the working context, P-E fit can be defined as “the compatibility between an individual and a work environment that occurs when their characteristics are well matched” (Kristof-Brown et al., 2005, p. 281). According to P-E fit theory, an employee’s attitudes and behaviors do not separately arise from the individual and work environment; rather, they emerge from the interplay between the two (Edwards, 1996). Whereas a match between employees and their work environment can enhance the former’s mental and physical well-being, a mismatch can induce stress as well as impose mental and physical strain.

The P-E fit theory identifies two kinds of fit: (1) the S-V fit, also known as the needs-supplies fit, and (2) the D-A fit (Ayyagari et al., 2011; Edwards, 1996; Edwards & Rothbard, 1999). The S-V fit refers to the congruence between a person’s values and the supplies in the environment available to fulfill their values. Here, values refer to the person’s conscious desires, and generally subsume interests, preferences, motives, and goals. Supplies refer to the aspects or level of characteristics available in the environment that may fulfill the person’s values, which often include the amount, frequency, or qualities of job characteristics, as well as extrinsic and intrinsic rewards such as pay and recognition (Ayyagari et al., 2011; Shaw & Gupta, 2004). The S-V fit involves what an employee expects to derive from a job and what the job can offer to keep the employee (Caplan, 1987). In this sense, fit is akin to a need-satisfaction match, while a gap between the components will result in dissatisfaction (Edwards, 1996; Kristof-Brown et al., 2005). The D-A fit refers to the fit between the demands of the environment and a person’s abilities. Here, demands reflect the qualitative and quantitative requirements faced by the person, and include objective demands (e.g., commute time and length of workweek) and socially constructed norms and role expectations, while abilities comprise the skills, energy, time, knowledge, and resources that the person may muster to meet the demands. The D-A fit involves what employees can provide to keep a job and what the job requires of them (Caplan, 1987). In this sense, fit is akin to a D-A match, while a gap between the components will result in tension (Kristof-Brown et al., 2005).

#### 2.3.2. Manifestations of P-E misfit

Each of the above mentioned two types of P-E fit captures different salient, distinctive, and complementary elements of fit, while a gap in each pair will induce a corresponding misfit (Ayyagari et al., 2011; Edwards, 1996). Unplanned and mandated epidemic-induced telecommuting may disrupt the pre-lockdown work norms and routines, constraining what the original work environment can offer (i.e., supply) and what an employee can perform (i.e., ability). Therefore, the original balance between employees and the work environment may be eroded, forming or heightening the discrepancies between personal value (or ability) and environmental supply (or demand); this may result in the S-V and D-A misfits. For example, employees who enjoy business travel were not likely to travel after the outbreak of COVID-19, but were constrained at home, resulting in a gap between what the individuals valued and what the working environment could supply. Given that the discrepancy between the employees and work environment might have existed before lockdown, we focus on the misfit generated during epidemic-induced telecommuting, that is, the misfit during lockdown in comparison to that before lockdown.

Previous studies have adopted three distinct approaches in examining P-E fit: molar, molecular, and atomistic approaches (Ayyagari et al., 2011; Edwards et al., 2006; Kristof-Brown et al., 2005). While the molar approach adopts a gestalt view and uses a direct measure of fit or misfit, the molecular and atomistic approaches adopt the reductionist view and consider the person and the environment to be two separate dimensions. In particular, studies that adopt the molecular approach directly assess the perceived discrepancy between the two dimensions, whereas those that adopt the atomistic approach separately measure the two dimensions and then combine them in some way to reflect the fit or misfit (Edwards et al., 2006). Although all the approaches have been used in previous studies, this study follows the molecular approach to conceptualize misfit.

The manifestation of the S-V and D-A misfits occurs through disruptions and changes to work experience in epidemic-induced telecommuting. The adoption of a telecommuting arrangement is often accompanied by changes in the basic or inherent features of job tasks, the arrangement of working time and space, and patterns of interaction with other people at work (Mahler, 2012). Following prior research on telecommuting and COVID-19, we identify four key aspects that play central roles in reflecting and explaining work experience: *vocation, space, time, and social relationship*. We then posit that epidemic-induced telecommuting disturbs the working-environment supply and employee ability in these four aspects. Subsequently, we conceptualize misfit as multi-dimensional, exhibited through four dimensions:

- **(a) Vocational misfit** is defined as the misfit triggered by changes in the nature of job tasks and how job tasks are performed. Job task is an essential element that defines work experience, and thus is selected to exhibit the work-related P-E misfit (Mahler, 2012; Venkatesh, 2020).

- **(b) Temporal misfit** refers to the misfit triggered by limitations on when working activities are performed. Time is a core factor that shapes work experience (Tietze & Musson, 2002). Adam (1990) suggested that the duration of work, temporal scheduling of a work task, and pace of work activity serve as a foundation for work experience. Therefore, time arrangement is selected as a dimension that exhibits work-related P-E misfit.

- **(c) Spatial misfit** is the misfit triggered by restrictions on where working activities are performed. The location and characteristics of where work activities take place represent an important element that shapes work experience. Existing studies have shown that a lack of face-to-face interaction with co-workers is a...
The salient difference between working before and after the outbreak of the Covid-19 pandemic (Toscano & Zappalà, 2020). Thus, space arrangement is chosen to exhibit work-related P-E misfit.

(d) **Social misfit** entails the misfit triggered by changes in how employees interact and engage with other people in work activities. Prior research has considered social affiliation and work relationship to be important aspects in a work setting (Wiesenfeld et al., 2001). Accordingly, we employ social relationship to exhibit work-related P-E misfit.

Considering the above-mentioned four dimensions and the context of epidemic-induced telecommuting, we consolidate the literature on job value and demand, employee job expectation, and employee job skills to advance (1) **task identity**, (2) work-scheduling latitude, (3) professional proximity, and (4) social support as the focal dimensions that constitute the S-V misfit. Additionally, we consider (1) skill variety, (2) time-based family-work balance, (3) space-based family-work balance, and (4) initiated-task interdependence as the focal dimensions that exhibit the D-A misfit. These constituent sub-dimensions of S-V and D-A misfits are summarized in Table 2.

Epidemic-induced telecommuting may restrict what an organization or a job can offer employees, thus restricting organizations from providing the work environment that meets their employees’ values. Consequently, an employee may perceive a heightened discrepancy between what they want and what the working environment provides in epidemic-induced telecommuting, resulting in an S-V misfit (Ayyagari et al., 2011; Cable & DeRue, 2002). Task identity is about the degree to which a job involves completing a whole, identifiable outcome (Morris & Venkatesh, 2010). It is a typical job characteristic. As the nature of a task may be altered in epidemic-induced telecommuting, a job’s supply of task identity tends to decrease, representing a facet of the S-V misfit. Work-scheduling latitude refers to the extent to which an employee has control over the scheduling of work tasks to suit themselves (Pierce & Newstrom, 1983). Schedule flexibility is a representative employee’s expectation (Jamal et al., 2021). Conventional, voluntary telecommuting often brings employees with scheduling flexibility and autonomy; however, epidemic-induced telecommuting is mandatory, full-time, and of a large scale, which often requires employees to be on duty at their regular working hours, and thus reduces their flexibility in temporal scheduling. Moreover, to cope with the hastened, mandatory transition, employees need to work for longer hours to familiarize themselves with the changes, learn new things, develop new routines, and cope with time zone differences as business trips are restricted (Chong, Chang, & Chong, 2020). Additionally, a pandemic influences the degree to which employees feel in control over their work and personal lives (Syrek, Kühnel, Vahle-Hinz, & de Bloom, 2022). Taking care of personal and family lives during epidemic-induced telecommuting is often a “must” rather than a “choice.” Due the containment measures in a pandemic, employees often must spend additional time with families (Carillo et al., 2021), while the home environment may prevent employees from working when they want to, and thus may reduce employees’ control over the scheduling of work tasks. Thus, we consider a misfit in work-scheduling latitude as a typical aspect of an S-V misfit. We define professional proximity as a state of mind in which one feels close to others at work. A misfit in professional proximity is closely related to professional isolation, which is considered as a major shortcoming associated with telecommuting (Golden et al., 2008; Jamal et al., 2021). Telecommuting may restrict employees’ opportunities for professional and social interactions with colleagues and reduce their likelihood of forming and maintaining interpersonal relationships (Cooper & Kurland, 2002; Jamal, Anwar, Khan, & Saleem, 2021). While this problem could be alleviated by reducing the frequency of telecommuting in traditional contexts, it is especially salient under epidemic-induced telecommuting, where mandatory social distancing is enforced for a long period. Therefore, a misfit in professional proximity represents a salient aspect of an S-V misfit. Social support refers to the extent to which an employee has opportunities to receive advice and assistance from other people in the workplace (Morgeson & Humphrey, 2006). Employees tend to expect social support at work; however, in epidemic-induced telecommuting, people may be less likely to establish and maintain social interactions at work, and thus may have fewer opportunities to obtain support. Therefore, a misfit in social support can be an outstanding aspect of misfit to be considered.

Additionally, the prolonged period of mandated telecommuting may also increase certain job demands and constrain what employees can provide. In this sense, epidemic-induced telecommuting makes it difficult for employees to meet their work demands. The decrease in employees’ ability tends to cause or widen the gap between the demand of the job and the employees’ actual ability in epidemic-induced telecommuting, resulting in a D-A misfit (Ayyagari et al., 2011). Skill variety refers to how much a job requires different skills and talents, and is a well-known job demand (Morris & Venkatesh, 2010). Work activities in epidemic-induced telecommuting tend to require employees to be able to work remotely and use collaborative tools; thus, the demand for skill variety tends to increase and cause misfit. As skill variety is essential for completing work in telecommuting, such misfit represents a basic aspect of D-A misfit. Time-based and space-based family-work balance are derived from Carlson et al. (2000)’s family inference with work. They refer to the extent to which an employee’s work-related and family-related roles are compatible in terms of time and space arrangement. In epidemic-induced telecommuting, people are confined to their homes. An employee’s work life tends to intertwine with their personal and family lives (Coban, 2021; Jamal et al., 2021). Consequently, employees face issues such as time fragmentation and space sharing with family, which adversely affect their ability to cope with role conflicts (Waizenegger et al., 2020). Considering that work-family balance is a prominent topic in telecommuting and especially pronounced during lockdown (Delanoëje et al., 2019), we consider the misfits in time-based and space-based family-work balance as two salient aspects of D-A misfit. Initiated task interdependence refers to the extent to which other people in the workplace rely on an employee’s completion of a task to complete their own work (Morgeson & Humphrey, 2006). Highly interdependent jobs require continuous information exchange among co-workers (Jamal et al., 2021). In epidemic-induced telecommuting, employees’ ability to coordinate with others is restricted because the social distancing impedes most of the spontaneous coordination; however, work tasks may become highly interdependent because of remote working. Consequently, the work environment may have a higher requirement for employees to finish their tasks to allow other work activities to proceed, which represents a typical aspect of D-A misfit.

### 2.3.3. Missfits as antecedents of reactance

Any force or thing that makes it difficult for a person to exercise a certain freedom can be considered as a threat (Shen, 2015). The

| Dimension | Trigger in Epidemic-induced Telecommuting | Sub-dimension of Supply-Value Misfit | Sub-dimension of Demand-Ability Misfit |
|-----------|------------------------------------------|-------------------------------------|----------------------------------------|
| Vocational | Changes in the nature of job tasks and how tasks are performed. | Misfit in task identity | Misfit in skill variety |
| Temporal | Limitations on when working activities are performed. | Misfit in work-scheduling latitude | Misfit in time-based family-work balance |
| Spatial | Restrictions on where working activities are performed. | Misfit in professional proximity | Misfit in space-based family-work balance |
| Social | Changes in how employees interact with other people involved in working activities. | Misfit in social support | Misfit in initiated-task interdependence |

Table 2: Focal dimensions of person-environment misfits.
disruption of work experience in epidemic-induced telecommuting, be it to shape, reinforce, or change work routines, constitutes a source of threat to freedom. When S-V misfit increases in epidemic-induced telecommuting, the discrepancy between an employee’s value and what their working environment can offer increases. This restricts and threatens the employee’s freedom, increases the magnitude of the perceived loss of freedom, and results in psychological reactance. When an employee experiences misfit, they must cope with the mandated changes at work. The heightened discrepancies between what the employee values and what the work environment can supply are out of the employee’s control, and the employee will be forced to take actions to adjust. This means that the employee’s range of choices at work is limited, and the employee loses their control over task identity, work scheduling latitude, professional proximity, and social support, which eventually triggers psychological reactance. Similarly, an increase in D-A misfit in an employee’s work experience can disempower the employee in terms of skill variety, time-based and space-based family-work balance, and initiated task interdependence (Coban, 2021). The employee will thus perceive an increased threat to freedom and will be aroused to experience reactance. We therefore hypothesize the following:

Hypothesis 3. S-V misfit is positively associated with psychological reactance.

Hypothesis 4. D-A misfit is positively associated with psychological reactance.

2.4. Roles of collaborative technology use

2.4.1. Theory of technology affordance: an overview

Technologies are considered as an essential element both in telecommuting arrangements and during COVID-19 lockdowns (Venkatesh, 2020; Venkatesh & Johnson, 2002). To perform work in epidemic-induced telecommuting, employees must use technologies and collaborate with other people at work (Waizenegger et al., 2020). To investigate the roles of digital technologies in epidemic-induced telecommuting, this study adopts the theory of affordance. Affordances can be defined as “potential[s] for behaviors associated with achieving an immediate concrete outcome and arising from the relation between an artifact and a goal-oriented actor or actors” (Treem & Leonardi, 2013, p. 155). Affordance theory has been widely used to understand the roles of information technology (IT) design and use while many studies adopt the affordance perspective to examine the roles of IT in workplace contexts such as telecommuting (Pee, 2018).

In the context of telecommuting, researchers have highlighted the technology affordances of connectedness, identifiability, and mobility, which are often associated with smartphone use (Chatterjee et al., 2017). Connectedness is about the potential of a technology for use in establishing communications. Identifiability refers to the potential of a technology to allow a user to represent a unique identity. Mobility refers to the potential of a technology for meandering and changing locations. However, considering that epidemic-induced telecommuting is unplanned, mandated, and on a large scale for a prolonged period, prior research has suggested that employees are likely to “discover new affordances of technology or to repurpose existing technologies in new and creative ways” (Waizenegger et al., 2020, p. 430). In particular, during lockdown, people are usually under home confinement and in full-time telework. This makes mobility much less salient during lockdowns. Furthermore, because remote working tends to be on a massive scale and lasts for a prolonged period, employees must use collaborative technologies not only for establishing connections but also to sustain communication and social relationships (Waizenegger et al., 2020). Therefore, we adopt the concept of association and persistence from Treem and Leonardi (2013) to contextualize Chatterjee et al. (2017)’s connectedness. Thus, considering the context of epidemic-induced telecommuting, this study focuses on employees’ use of collaborative technologies for association, persistence, and identifiability.

2.4.2. Moderating effects of collaborative technology use

Although mandated changes due to epidemic-induced telecommuting constrain employees’ freedom at work, the use of collaborative technologies provides extra solutions and may empower employees in many aspects of their work. The challenges caused by the changes in work environment in epidemic-induced telecommuting can be addressed by appropriate use of collaborative technologies (Belzu-neguí-Eraso & Erro-Garcés, 2020). Therefore, an employee’s loss of freedom at work may simultaneously be restored if collaborative technologies are used well in epidemic-induced telecommuting, reducing the effect created by misfit on the perceived threat to freedom and the corresponding psychological reactance.

Association refers to the degree to which collaborative technologies are used for establishing connections among individuals and between individuals and information (Treem & Leonardi, 2013). Due to a lack of interpersonal communications and engagement, S-V and D-A misfits cause loss of freedom in social relationships and physical interactions. If employees appropriately use collaborative technologies for association, they have a wider range of choices to connect with one another and to share information. This opens up options for employees to communicate with one another and engage with content for a variety of purposes, including gaining advice and establishing computer-mediated proximity. Thus, the threat to freedom caused by S-V misfit will arouse less reactance in employees who use collaborative technologies well for association than in those who do not. We therefore hypothesize the following:

Hypothesis 5a. The association enabled by the use of collaborative technologies negatively moderates the effect of S-V misfit on psychological reactance.

When employees intensively use collaborative technologies for association, their jobs seem to rely on exchange of information, job coordination, and team work, which highlights the job demand for skill variety and level of job interdependence (Waizenegger et al., 2020). Consequently, employees may be more aware of the threats to freedom created by D-A misfit. That is, for employees who intensively use collaborative technologies for association, D-A misfit may be perceived to produce stronger and more salient threats, and thus may cause a stronger feeling of reactance. When there is a low level of association, the misfit between job demand and employee ability may appear to be less salient in front of others. Therefore, although employees may experience D-A misfit, such misfit may create less threats to employee freedoms, and is thus less likely to produce a state of reactance. That is, the threat to freedom that is caused by D-A misfit will be more powerful in triggering reactance for employees who use collaborative technologies well for association than for those who do not. We therefore hypothesize the following:

Hypothesis 5b. The association enabled by the use of collaborative technologies positively moderates the effect of D-A misfit on psychological reactance.

Persistence refers to the extent to which collaborative technologies are used to keep information and relationships available and lasting (Treem & Leonardi, 2013). If collaborative technologies are used well for persistence, employees can trace communication and respond to one another without the constraints of immediacy and spontaneity. S-V misfits in scheduling latitude and professional proximity, together with D-A misfits in time-based and space-based family-work balance, cause loss of freedom in time and space management and contribute to psychological reactance due to time fragmentation and space sharing. Persistence, meanwhile, allows employees to find the information they need and to resume work activities whenever and wherever convenient (Treem & Leonardi, 2013). Because persistence reduces the requirement for closeness, promptness, and immediacy, it allows employees to rely less...
on scheduling, proximity, and work family balance to gain control, reducing the effects of misfit on loss of freedom and the aroused reactance. Moreover, as the work activities and task specifications can be persistent when using collaborative technologies, employees have more flexibility to continue and eventually complete entire pieces of work as well as more time to work on the tasks that require high skill diversity. Because persistence facilitates continuity and trackability, it reduces the extent of the constraints created by S-V misfit in task identity and D-A misfit in skill diversity on employee freedom, and thus alleviates the influence of the misfits on psychological reactance. Based on the above, we expect persistence to moderate the effects of misfits on psychological reactance, such that the S-V and D-A misfits are less influential in contributing to loss of freedom and less likely to arouse experience reactance when collaborative technologies are well used for persistence. We therefore hypothesize the following:

**Hypothesis 6a.** The persistence enabled by the use of collaborative technologies negatively moderates the effect of S-V misfit on psychological reactance.

**Hypothesis 6b.** The persistence enabled by the use of collaborative technologies negatively moderates the effect of D-A misfit on psychological reactance.

Identifiability refers to the extent to which collaborative technologies are used to make people identifiable with their unique identities. Identifiability allows employees to be identified and to gain recognition for what they do, which is likely to enable the feeling of psychological empowerment, thus reducing the effect of misfits on psychological reactance. Moreover, prior research suggests that identifiability may facilitate the enactment of organizational compassion, which would lead to measures taken in an organization reducing individual employees’ suffering (Chatterjee et al., 2021). It could also encourage individual employees to know one another on a personal basis, develop a sense of team bonding, care more for one another, and focus less on self-gain (Waizenegger et al., 2020). This would allow employees to show less anger at other people and the organization, which might mitigate the effects of S-V and D-A misfits on employees’ perceived loss of freedom and reactance. We therefore hypothesize the following:

**Hypothesis 7a.** The identifiability enabled by the use of collaborative technologies negatively moderates the effect of S-V misfit on psychological reactance.

**Hypothesis 7b.** The identifiability enabled by the use of collaborative technologies negatively moderates the effect of D-A misfit on psychological reactance.

The proposed research model is shown in Fig. 2.

### 3. Methodology

#### 3.1. Measurement

The proposed research model was tested via an online survey. Based on our conceptualization, S-V and D-A misfits are reflective-reflective second-order constructs. Specifically, misfits in task identity, work scheduling latitude, professional proximity, and social support are the first-order constructs that reflect S-V misfit, whereas misfits in skill variety, time-based family-work balance, space-based family-work balance, and initiated task interdependence are the first-order constructs that exhibit D-A misfit. All the first-order constructs comprise multiple
items taken from the literature, with slight alterations to suit the focal research setting to increase the validity and reliability of the results. Moreover, to ensure that we captured the relationships between the variables in the lockdown due to the pandemic and mitigated the individual baseline differences before the lockdown, all the variables were measured using seven-point comparative scales; thus, we instructed the respondents to indicate their experience/opinions during the COVID-19 lockdown compared to those before the lockdown.

The measurement items for counter-productive behavior, work exhaustion, association and persistence, and identifiability were, respectively, adapted from Ramos-Villagrasa et al. (2019), Ahuja et al. (2007), Treem and Leonardi (2013), and Chatterjee et al. (2017). For psychological reactance, we followed Dillard and Shen (2005)’s operationalization and used the measurement items for perceived loss of freedom. The respondents were asked to recall their work experience before and during the COVID-19 lockdown. Seven-point semantic differential scales were used to measure the items, with 1 representing “much more before lockdown” and 7 representing “much more during lockdown.”.

We adopted the molecular approach to measure subjective misfit by directly asking an individual how well their personal characteristics fit with those of their work environment in each sub-dimension of S-V and D-A misfits. Specifically, for S-V misfit, the respondents were instructed to compare the extent to which their values were fulfilled by their work environment before and during the COVID-19 lockdown (1 = much less before lockdown; 7 = much less during lockdown). The measurement items for misfits in task identity, work-scheduling latitude, professional proximity, and social support were, respectively, adapted from Morris and Venkatesh (2010), Pierce and Newstrom (1983), Golden et al. (2008), and Morgeson and Humphrey (2006). Regarding the D-A misfit, we asked the respondents to compare the extent to which their abilities fulfilled their job demands before and during COVID-19 lockdown (1 = much less easily before lockdown; 7 = much more easily during lockdown). The measurement items for misfits in skill variety, time-based and space-based family-work balance, and initiated-task interdependence were, respectively, adapted from Morris and Venkatesh (2010), Carlson et al. (2000), and Morgeson and Humphrey (2006).

### 3.2. Data collection

To empirically test our hypotheses, the respondents were recruited from Amazon’s Mechanical Turk (MTurk), an online forum in which participants can choose to participate in studies for payment (Wien & Peluso, 2021). MTurk was used to collect data because it is a reliable platform for data collection, while the respondents have been found to be representative of the US general work force (Buhrmester, Kwang, & Gosling, 2011; Daly & Natarajan, 2015). Most of our respondents spent approximately 10 min to complete the questionnaire; they each received USD 1 as compensation, which was close to the US minimum wage. This amount of compensation was suitable, considering that MTurk’s workforce was willing to work for USD 6 per hour or less as compensation (Berinsky et al., 2012; Mason & Suri 2012). The questionnaire was posted on MTurk, specifying that it was about work experience before and during the pandemic lockdown. Since we were interested in the influence of the P-E misfit created by epidemic-induced telecommuting, our target respondents were workers who had experienced work routine changes under the epidemic-induced telecommuting. Screening questions were used to determine whether the respondents had experienced a mandated telecommuting arrangement during lockdown and whether their work routine had been affected by the lockdown. Respondents who met the requirements were allowed to fill in the questionnaire. In total, we received 476 survey attempts, 370 of which were valid responses and were used for data analysis. The respondents’ demographic information is summarized in Table 3. The table shows that the lowest proportion of respondents earn an annual income of less than USD 30,000, while more than 50% earn an annual income of over USD 50,000, which is consistent with the US population statistics in 2021 (DQYDJ.com, 2022). Moreover, most respondents hold college and bachelor’s degrees. This reflects a pattern similar to that of employed people who teleworked because of COVID-19 (BLS.gov, 2021).

To address the potential issue of common method bias, we performed Harman’s single-factor test, which revealed that no single component emerged, with the first factor accounting for less than half of the variance in the variables. Thus, the likelihood of a common method bias was minimal in this study (Lindell & Whitney, 2001).

### 3.3. Assessment of measurement model

We used partial least squares structural equation modeling (PLS-SEM) for model assessment because our model has second-order constructs (Hair et al., 2021). We adopted the reflective repeated indicator approach to model the paths of the first-order constructs to misfit and obtain the latent variable scores for the first-order constructs (Hair et al., 2021).

To assess the measurement model, we first examined its reliability and validity. The outer loadings for all the measurement items were higher than the required 0.708 (Hair et al., 2019). Cronbach’s alpha values for all the first-order constructs ranged from 0.812 to 0.932,

| Table 3 | Descriptive statistics of sample. |
|----------------------------------|-------------------------------|
| **Demographic Characteristic**   | **Count** | **Percentage** |
| Gender                           |          |                |
| Female                           | 146      | 39.46%         |
| Male                             | 224      | 60.54%         |
| Age                              |          |                |
| 18-25                            | 55       | 14.86%         |
| 26-35                            | 181      | 48.92%         |
| 36-45                            | 74       | 20.00%         |
| 46 and above                     | 60       | 16.22%         |
| Education Level                  |          |                |
| High school and below            | 29       | 7.84%          |
| College and bachelor’s degree    | 213      | 57.57%         |
| Master’s degree and above        | 128      | 34.59%         |
| Income Level (Annual)            |          |                |
| Below USD 30,000                 | 68       | 18.38%         |
| USD 30,000 - USD 50,000          | 108      | 29.19%         |
| USD 50,000 - USD 75,000          | 120      | 32.43%         |
| USD 75,000 and above             | 74       | 20.00%         |

| Table 4 | Reliability and validity of latent constructs. |
|---------|-----------------------------------------------|
| **Construct** | **Cronbach’s Alpha (α)** | **Composite Reliability (CR)** | **Average Variance Extracted (AVE)** |
| Counter-productive behavior      | 0.822 | 0.876 | 0.586 |
| Work exhaustion                  | 0.870 | 0.911 | 0.720 |
| Psychological reactance          | 0.814 | 0.878 | 0.642 |
| Task identity                    | 0.879 | 0.925 | 0.805 |
| Work scheduling                  | 0.912 | 0.934 | 0.739 |
| Initial task interdependence     | 0.915 | 0.932 | 0.663 |
| Professional proximity           | 0.932 | 0.947 | 0.748 |
| Social support                   | 0.822 | 0.894 | 0.737 |
| Skill variety                    | 0.853 | 0.911 | 0.773 |
| Time-based family-work balance   | 0.863 | 0.917 | 0.786 |
| Space-based family-work balance  | 0.812 | 0.889 | 0.727 |
| Association                      | 0.842 | 0.905 | 0.760 |
| Persistence                      | 0.857 | 0.913 | 0.777 |
| Identifiability                  | 0.855 | 0.911 | 0.774 |
Results of regression analysis.

Table 6

| Variables | Counter-Productive Behavior | Work Exhaustion | Psychological Reactance |
|-----------|----------------------------|-----------------|-------------------------|
|           | Model 1                    | Model 2         | Model 3                 |
| Psychological Reactance | 0.631*** (15.62) | 0.738*** (21.01) |
| Supply-value Misfit | (S-V Misfit) | | |
| (S-V Misfit) | 0.176* | 0.232** (2.41) | 0.313** |
| Demand-ability Misfit | (D-A Misfit) | | |
| (D-A Misfit) | 0.334*** (4.57) | 0.327** (4.50) |
| Association × S-V Misfit | | -0.308** (3.19) |
| Association × D-A Misfit | | 0.396** (3.53) |
| Persistence × S-V Misfit | | 0.316* (2.12) |
| Persistence × D-A Misfit | | -0.004* n.s. |
| Identifiability × S-V Misfit | | 0.123** (1.81) |
| Identifiability × D-A Misfit | | -0.281** (2.84) |
| R² | 0.399 | 0.545 | 0.234 |
| Adjusted R² | 0.397 | 0.544 | 0.230 |

Note: *** and * denote p < 0.001, p < 0.01, and p < 0.05, respectively; n.s.: not significant; T-values are in parentheses.

The latent variable scores were then used for regression analysis. The results are shown in Table 6 and Figure 3. The results indicate that threat to freedom is positively associated with counter-productive behavior (β = 0.631, p < 0.001) and work exhaustion (β = 0.738, p < 0.001), supporting H1 and H2. S-V misfit positively impacts psychological reactance (β = 0.232, p < 0.01), thus supporting H3. D-A misfit also positively impacts psychological reactance (β = 0.327, p < 0.001), supporting H4. Regarding collaborative technology use for association, the results show that it negatively moderates the relationship between S-V misfit and psychological reactance, and positively moderates the relationship between D-A misfit and psychological reactance. Thus, H5a and H5b are both supported. However, in terms of collaborative technology use for persistence, although it is found to significantly moderate the relationship between S-V misfit and psychological reactance, the moderating effect is positive, which is different from expectation. Moreover, the results show that persistence does not significantly moderate the influence of D-A misfit on psychological reactance. Therefore, H6a and H6b are not supported. Additionally, collaborative technology use for identifiability negatively moderates the effect of D-A misfit on psychological reactance, which supports H6b; however, the moderating effect of identifiability on the relationship between S-V misfit and psychological reactance is not significant, thus failing to support H6a.

3.5. Post-hoc analyses of mediating effects

To help us further understand the relationships between the P-E misfits, psychological reactance, and employee outcome variables, we further evaluated whether psychological reactance mediated the effects of S-V and D-A misfit on counter-productive behavior and work exhaustion. We followed Hair et al. (2013)’s instruction on testing mediating effects. First, we tested for the significance of the indirect effects. The results revealed that the indirect effect of D-A misfit via psychological reactance on counter-productive behavior and work exhaustion was significant (p < 0.01 and p < 0.05, respectively). We then considered the significance of the direct effects of D-A misfit on counter-productive behavior and work exhaustion. The results suggested that the direct effects were significant (β = 0.365, p < 0.001 and β = 0.314, p < 0.001, respectively). Given that both the direct and indirect effects were significant, we concluded that psychological reactance partially mediated the effects of S-V misfit on counter-productive behavior and work exhaustion. To further substantiate the type of partial mediation, the product of the direct and indirect effects was
calculated. Both the direct and indirect effects were positive, which meant that the sign of their product would be positive; thus, we could conclude that psychological reactance represented a complementary mediation of the relationship between D-A misfit and employee outcomes (i.e., counter-productive behavior and work exhaustion). Moreover, the indirect effects of S-V misfit, via psychological reactance, on counter-productive behavior and work exhaustion were also significant ($p < 0.05$ for both); however, the direct effects of S-V misfit on counter-productive behavior and work exhaustion were not significant. Therefore, we concluded that psychological reactance fully mediated the effects of S-V misfit on employee outcomes (i.e., counter-productive behavior and work exhaustion).

4. Conclusion

Epidemic-induced telecommuting is a unique and important phenomenon that brings challenges during the COVID-19 and other pandemic lockdowns. This study focuses on this salient social distancing measure during lockdowns and analyzes the role of epidemic-induced telecommuting in workers’ work experiences from the perspective of the psychological reactance theory and P-E fit theory. In epidemic-induced telecommuting, we conceptualized the S-V and D-A misfits and, from an analysis of data collected through a questionnaire survey, we found that both misfits were positively associated with the state of psychological reactance that employees experienced, which subsequently drove work exhaustion and counter-productive behaviors. Additionally, we found that different uses of collaborative technology played different roles in shaping the effects of misfits on psychological reactance.

4.1. Discussion of key empirical findings

Several important findings were obtained from this study. First, we found that psychological reactance led to negative employee outcomes (i.e., counter-productive behavior and work exhaustion) in epidemic-induced telecommuting. This illustrates the need to consider the loss of freedom that causes psychological reactance in the workplace during lockdowns. Our findings are consistent with those obtained in previous studies that psychological reactance can cause negative individual outcomes, such as burnout in workplace condition and message fatigue in persuasion text (Golden, 2006; Kim & So, 2018; Pishghadam et al., 2021). Moreover, both S-V and D-A misfits restrict employees’ freedom at work and arouses their psychological reactance. This is consistent with prior findings that psychological reactance is elicited when situational ambiguity restricts individuals’ behavioral freedom (Ma & Kay, 2017). Based on the post-hoc mediation analyses, we revealed that both misfits caused negative employee outcomes via psychological reactance, which further confirmed the importance of psychological reactance in shaping employees’ work experience when facing unplanned and mandated telecommuting arrangements. While conventional telecommuting tends to be associated with positive employee outcomes (Gajendran & Harrison, 2007), our results show that epidemic-induced teleworking could harm employee performance. These findings offer unique insights into epidemic-induced telecommuting, and reveal the theoretical and practical importance of extending the discussion on telecommuting to epidemic-induced telecommuting.

Our results also suggest that use of collaborative technologies plays important roles in epidemic-induced telecommuting. We found that collaborative technology use for association mitigated the effect of S-V misfit on reactance, and that collaborative technology use for identifiability alleviated the effect of D-A misfit on reactance. However, collaborative technology use for association strengthens the effect of D-A misfit on reactance. The findings indicate that the use of technologies in telecommuting, generally, may lead to an increased level of freedom (Gajendran & Harrison, 2007), except when the purpose of use (i.e., for association) is a salient part of job demand. This is consistent with the general opinion that technology use in telecommuting tends to produce mixed effects (Wicks, 2002).

Surprisingly, collaborative technology use for persistence does not significantly moderate the relationship between D-A misfit and psychological reactance. An alternative explanation could be that although persistence allows content and communications to be lasting and trackable, it may not reduce the need for immediacy. During lockdowns, most companies adopt telecommuting on a large scale, if not fully. When everyone is working online, persistence may bring little flexibility and empowerment, and thus does not mitigate the effect of D-A misfit on psychological reactance. Interestingly, too, we found that collaborative technology use for persistence positively moderated the effect of S-V misfit on psychological reactance, which is contrary to our hypothesis. This could be because, when employees trace content and maintain relationships using collaborative technologies, they may recall the “good-old” days before lockdown and may be more sensitive to what they value. The use of technology for persistence thus causes employees to perceive more importance of the threatened freedom in task identity, scheduling latitude, professional proximity, and social support. Prior literature suggests that issue involvement and the perceived importance of threatened freedom influence the effect of the threat on reactance (Quick et al., 2011; Rosenberg & Siegel, 2018). Therefore, it is plausible that collaborative technology use for persistence induces employees to be more sensitive to the loss of freedom due to S-V misfit and enables such threatened freedom to be a stronger cause of psychological reactance. Another unexpected finding is that collaborative technology use for identifiability does not significantly moderate the effect of S-V misfit on threat to freedom. A possible explanation is that although identifiability can effectively trigger organizational compassion and team bonding and thus impede the effect of D-A misfit on reactance, making people identifiable and rewarding them for their work may already be a norm in this digital society, and thus has no additional empowerment effects. These surprising findings illustrate that the roles of technology use in epidemic-induced telecommuting can be more complicated, and reveal opportunities for future research to further explore the use of technologies in such a unique context.

4.2. Contributions to theory

This study contributes to the literature as follows: First, we consider the unique characteristics of epidemic-induced telecommuting into account and expand the P-E fit lens by theorizing and empirically investigating the S-V and D-A misfits to capture environmental disruptions in epidemic-induced telecommuting during lockdowns. A wide range of studies have examined P-E fit, its antecedents, and positive impacts (Yu, 2009); however, the unplanned, mandated, massive-scale, and long-lasting epidemic-induced telework makes the mismatch a salient phenomenon. While some scholars have emphasized the erosion of fit and called for research attention, few studies have empirically examined the role of misfit in epidemic-induced telecommuting (Carnvale & Hatak, 2020). Therefore, this study contributes to prior literature on telecommuting by extending the conversation to epidemic-induced telecommuting and proposing the theoretical lens of P-E misfit.

Moreover, we develop the two types of P-E misfit as multi-dimensional concepts and simultaneously compare their effects. While a few studies have considered multi-dimensional misfit, they have focused on different types and levels of misfits (Wang & Li, 2019; Wang et al., 2020). Moreover, a relatively limited number of studies have simultaneously examined both the S-V and D-A versions of fit (Livingstone, Nelson, & BarrView, 1997). In this study, however, we simultaneously consider S-V and D-A misfits, each with its corresponding, salient sub-dimensions under epidemic-induced telecommuting. By treating S-V and D-A misfits as higher-order latent variables reflectively explained from the vocational, temporal, spatial and social perspectives, we expect our research to provide systematic and novel insights into P-E misfit.
Furthermore, comparative scales (i.e., semantic differential scales) are used to measure misfits and all the other variables in the research model. This study is particularly concerned with capturing the relationships among the variables during the epidemic-induced telecommuting. However, each individual respondent tends to have their own baseline work experience before lockdown. By asking the respondents to indicate their experience during relative to that before lockdown, we seek to rule out the noise due to individual baseline differences. This represents a new approach to understanding the effects of lockdown and social distancing on employees’ work experience or other cognitive, affective, and behavioral outcomes. This approach can also be generalized to capture other before-and-after baseline differences.

Additionally, while many studies on telecommuting recognize the value of using collaborative technologies, many are qualitative or focus on the direct effects of digital technologies (Gajendran & Harrison, 2007). In this study, we enrich the literature on technology affordance on the direct effects of digital technologies (Gajendran & Harrison, 2007). The findings from this study can help practitioners. Practitioners should be aware of the unique characteristics of epidemic-induced telecommuting that distinguish it from conventional telecommuting, and should accordingly tailor their strategies and practices. Instead of assuming increased autonomy and flexibility, practitioners such as managers and human resource officers should focus on the loss of freedom and psychological reactance under epidemic-induced telecommuting. To avoid or alleviate negative outcomes such as counterproductive behavior and work exhaustion, practitioners such as managers and human resource officers should empower employees during epidemic-induced telecommuting. For example, managers should consider allowing employees sufficient autonomy over tasks, offering constructive feedback and suggestions, and showing appreciation of employees’ hard work (Siowanti & Musafi, 2020).

Additionally, practitioners in organizations may use this study as a reference to understand the potential manifestations and impacts of S-V and D-A misfits, as they result in reactance and subsequently negative employee outcomes. Specifically, practitioners should strive to achieve fit. In particular, organizations should seek to continue to offer what employees value: allowing them to complete entire and identifiable pieces of work; letting them define their own work schedule if possible; arranging regular team meetings or casual, daily check-ins to keep people involved; and creating opportunities for seeking and offering support (Waizenegger et al., 2020). Moreover, practitioners should design and deliver appropriate training for employees to acquire the new skills that organizations require during epidemic-induced telecommuting.

Furthermore, as collaborative technologies are essential in epidemic-induced telecommuting, practitioners should encourage the use of technologies for association; however, they need to avoid being too demanding. Organizations should design collaborative tools to afford identifiability and cultivate an environment in which every individual employee feels important. Appropriate policies should be in place to track employees’ experience and reduce their suffering.

4.4. Limitations and future research

Some limitations in this study provide opportunities for future research. First, the intensity of a lockdown and social confinement may vary considerably across countries and regions, while people with different cultural backgrounds may react to it differently. In this study, we seek to control for the lockdown differences by enlisting respondents whose work routines are affected by the lockdown. However, we do not account for cultural differences. Future research could extend the conversation and consider the effects of cultural and regional differences.

Second, this study focuses on the effects of work-related S-V and D-A misfits on psychological reactance and subsequently on employee outcomes. However, the boundaries between work and personal lives are largely blurred due to the large-scale, prolonged period of work from home. Therefore, future research may consider investigating how non-work-related factors shape employees’ work experience during epidemic-induced telecommuting.

Furthermore, this study focuses on the S-V and D-A perspectives of P-E (mis)fits. Given the richness of the P-E fit theory, alternative P-E perspectives can be considered, such as person-organization and person-people (mis)fits (Wang & Li, 2019; Wang et al., 2020). Future research can extend this study by considering fit from different perspectives.

CRediT authorship contribution statement

**Boying Li:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Chenyang Xue:** Writing – review & editing, Writing – original draft, Visualization, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Yue Cheng:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Eric T.K. Lim:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Chee-Wee Tan:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Declaration of Competing Interest

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

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Appendix A. Measurement items and factor loadings

See Table A1.
Table A1
Measurement items and factor loadings.

| Measurement Item                                                                 | Mean  | S.D.  | Factor Loading |
|---------------------------------------------------------------------------------|-------|-------|----------------|
| **Counter-Productive Behaviors** (Ramos-Villagraña et al., 2019)               |       |       |                |
| 1. I complained about minor work-related issues at work                         | 4.043 | 1.359 | 0.691          |
| 2. I made problems at work bigger than they were                                | 4.224 | 1.153 | 0.813          |
| 3. I focused on the negative aspects of situation at work instead of the positive aspects | 4.232 | 1.363 | 0.738          |
| 4. I talked to colleagues about the negative aspects of my work                 | 4.159 | 1.292 | 0.808          |
| 5. I talked to people outside the organization about the negative aspects of my work | 4.192 | 1.316 | 0.770          |
| **Work Exhaustion** (Ahuja et al., 2007)                                       |       |       |                |
| 1. I felt emotionally drained from my work                                      | 4.751 | 1.554 | 0.837          |
| 2. I felt mentally exhausted at the end of the workday                           | 4.784 | 1.597 | 0.853          |
| 3. I felt fatigued when I got up in the morning and had to face another day on the job | 4.686 | 1.556 | 0.880          |
| 4. I felt burned out from my work                                               | 4.846 | 1.504 | 0.823          |
| **Psychological Reactance** (Dillard & Shen, 2005)                              |       |       |                |
| 1. My freedom to choose work was threatened                                      | 4.924 | 1.439 | 0.782          |
| 2. I am unable to control my work activities                                     | 4.800 | 1.481 | 0.834          |
| 3. I felt constraint in how I work                                               | 4.776 | 1.487 | 0.828          |
| 4. My work behavior was influenced                                              | 4.824 | 1.490 | 0.759          |
| **Misfit in Task Identity** (Morris & Venkatesh, 2010)                          |       |       |                |
| 1. My needs of completing a whole and identifiable piece of work was fulfilled by my work environment | 4.586 | 1.619 | 0.918          |
| 2. My needs of completely finishing the pieces of work I began was fulfilled by my work environment | 4.435 | 1.650 | 0.888          |
| 3. My needs of doing an entire piece of work from beginning to end was fulfilled by my work environment | 4.511 | 1.638 | 0.885          |
| **Misfit in Work Scheduling Latitude** (Pierce & Newstrom, 1983)                |       |       |                |
| 1. My needs of defining my own work schedule was fulfilled by my work environment | 4.557 | 1.632 | 0.847          |
| 2. My needs of acting independently of my supervisor in defining my work schedule was fulfilled by my work environment | 4.673 | 1.611 | 0.876          |
| 3. My needs of defining my work schedule independently of others was fulfilled by my work environment | 4.592 | 1.594 | 0.856          |
| 4. My needs of exercising independent thought, judgement, and action in determining when I will work was fulfilled by my work environment | 4.646 | 1.525 | 0.844          |
| 5. My needs of exercising discretion in defining my work schedule was fulfilled by my work environment | 4.616 | 1.514 | 0.876          |
| **Misfit in Professional Proximity** (Golden et al., 2008)                      |       |       |                |
| 1. My needs of involving in activities and meetings that could enhance my career was fulfilled by my work environment | 4.546 | 1.599 | 0.797          |
| 2. My needs of having opportunities to be mentored was fulfilled by my work environment | 4.524 | 1.660 | 0.782          |
| 3. My needs of being in the loop was fulfilled by my work environment            | 4.605 | 1.464 | 0.796          |
| 4. My needs of having face-to-face contact with coworkers was fulfilled by my work environment | 4.578 | 1.854 | 0.828          |
| 5. My needs of not being isolated was fulfilled by my work environment           | 4.489 | 1.738 | 0.796          |
| 6. My needs of having emotional support of coworkers was fulfilled by my work environment | 4.516 | 1.795 | 0.850          |
| 7. My needs of having informal interaction with others was fulfilled by my work environment | 4.573 | 1.747 | 0.847          |
| **Misfit in Social Support** (Morgeson & Humphrey, 2006)                        |       |       |                |
| 1. My needs of having the opportunity to develop close friendships in my job was fulfilled by my work environment | 4.605 | 1.773 | 0.869          |
| 2. My needs of having the chance to get to know other people in my job was fulfilled by my work environment | 4.570 | 1.764 | 0.882          |
| 3. My needs of having the opportunity to meet with others in my work was fulfilled by my work environment | 4.505 | 1.716 | 0.867          |
| 4. My needs of having a supervisor who is concerned about my welfare was fulfilled by my work environment | 4.441 | 1.619 | 0.819          |
| 5. My needs of having colleagues who take a personal interest in me was fulfilled by my work environment | 4.446 | 1.686 | 0.869          |
| 6. My needs of having friendly colleagues was fulfilled by my work environment | 4.500 | 1.752 | 0.881          |
| **Misfit in Skill Variety** (Morris & Venkatesh, 2010)                         |       |       |                |
| 1. I was able to fulfill my job demand of doing many different things at work    | 4.681 | 1.514 | 0.870          |
| 2. I was able to fulfill my job demand of using a number of complex or high-level skills | 4.495 | 1.591 | 0.859          |
| 3. I was able to fulfill my job demand of doing complex and non-repetitive tasks | 4.603 | 1.527 | 0.848          |
| **Misfit in Time-based Family-work Balance** (Carlson et al., 2000)             |       |       |                |
| 1. My work responsibilities and the time I spent on family responsibilities fit  | 4.670 | 1.603 | 0.886          |
| 2. The time I spent with my family allowed me to have sufficient time for work activities that could be helpful to my career | 4.662 | 1.581 | 0.858          |
| 3. I could handle work activities given the amount of time I must spend on family responsibilities | 4.657 | 1.554 | 0.893          |
| **Misfit in Space-based Family-work Balance** (Carlson et al., 2000)            |       |       |                |
| 1. My work responsibilities and the space I used for family responsibilities fit | 4.765 | 1.585 | 0.900          |
| 2. The space I shared with my family allowed me to have enough space for work activities that could be helpful to my career | 4.635 | 1.624 | 0.882          |
| 3. I could handle work activities given the amount of space I must share with other family members | 4.597 | 1.552 | 0.877          |
| **Misfit in Initiated Interdependence** (Morgeson & Humphrey, 2006)             |       |       |                |
| 1. I was able to fulfill my job demand in terms of accomplishing my job before others complete their job | 4.614 | 1.512 | 0.829          |
| 2. I was able to fulfill my job demand in terms of completing my job because other jobs depend directly on it | 4.549 | 1.551 | 0.862          |
| 3. I was able to fulfill my job demand in terms of getting my job done so that other jobs can be completed | 4.522 | 1.605 | 0.866          |

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