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The hidden performance costs of professional isolation? A latent change score model of professional isolation during the early stage of COVID-19 pandemic

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Abstract

Although past research has found that professional isolation can affect discernible work-related outcomes (e.g. job performance and turnover) and important job attitudes, researchers have not examined its impact on those less discernible but still costly work behaviours. Drawing on self-regulation theories, this study examined the effect of professional isolation on employees' cyberloafing and time theft through self-control capacity impairment. With longitudinal data collected from 343 U.S. employees across five consecutive weeks at the early stage of the pandemic (i.e. from mid-March to late April 2020), our results of latent change score modelling analyses found that professional isolation change was positively related with changes in cyberloafing and time theft via change in self-control capacity impairment. The results increase our understanding of the hidden performance cost of professional isolation. This research also shifts the research focus from a static, between-person perspective to dynamic, within-person changes in professional isolation and related outcomes. The findings shed light on the self-regulation perspective in understanding the harmful consequences of professional isolation. Implications for future research are

discussed along with practical implications for organisations.

KEYWORDS

COVID-19, cyberloafing, professional isolation, self-control capacity impairment

INTRODUCTION

Professional isolation refers to employees' feelings that they are "cutoff from others" (Diekema, 1992, p. 484), and it reflects their "desire for support, understanding, and other social and emotional aspects of interaction are not met" (Taha & Caldwell, 1993, p. 277). Owing to technological development, it has become increasingly common for many employees to work remotely. As such, early research on professional isolation has been conducted in the broader context of telework (Cooper & Kurland, 2002; Golden et al., 2008). Although professional isolation has usually been examined as a key challenge faced by teleworkers (e.g. Allen et al., 2015), scholars argue that people can experience professional isolation regardless of whether they are physically absent from or present in the workplace (Golden et al., 2008; Miller, 1975; Smith, 1998). For example, at the early stage of the COVID-19 pandemic, both remote and on-site employees can experience high levels of professional isolation. This is because the majority of employees were forced into remote work whilst those who remained on-site had limited interpersonal interactions (Min et al., 2021). Those who remained on-site could feel professionally isolated because of the lack of interactions with others. Scholars have argued that more attention should be allocated to examining professional isolation during extended quarantine periods (Groarke et al., 2020). Thus, the COVID-19 pandemic provided a unique context in which to examine professional isolation (Kniffin et al., 2021; Rudolph et al., 2021).

Different from typical personal feelings (e.g. general social isolation or loneliness, Russell, 1996), professional isolation "is inextricably linked to employee development" (Cooper & Kurland, 2002, p. 512), and it shows one's belief about the degree of access to both professional and social contacts at work (Cooper & Kurland, 2002). Further, unlike workplace ostracism, which occurs when an individual perceives being ignored or excluded by others at work (Ferris et al., 2008; Williams, 2007), professional isolation usually occurs because of work settings that *constrain* workplace social interactions. For instance, employees who work from home can experience high levels of professional isolation (e.g. telework; Cooper & Kurland, 2002; Golden et al., 2008). In addition, when the workplace is only minimally occupied, employees can experience professional isolation because there is not a proper amount of social interactions (e.g. at the early stage of the COVID-19 outbreak).

Current research on professional isolation remains limited in three important ways. First, research has found that professional isolation affects discernible work-related outcomes (e.g. job performance and turnover) and important job attitudes (e.g. Golden et al., 2008; Mulki & Jaramillo, 2011; Spilker & Breaugh, 2021); however, to what degree professional isolation relates to less visible but costly behaviours is unknown. To extend this line of research, the present study examines cyberloafing and time theft, two forms of deviant work behaviours that involve unsanctioned, non-work-related activities during work time (Lim & Teo, 2005; Martin et al.,

2010), as important behavioural consequences. Cyberloafing is a specific form of loafing behaviour in which people use the internet for personal purposes during work hours (e.g. playing online games; Lim, 2002). Time theft generally refers to the misuse of time during work hours (e.g. unsanctioned breaks; Henle et al., 2010). Cyberloafing and time theft have been found to be very costly for organisations. For instance, it is reported that about 200.6 million hours per week were lost due to cyberloafing (Debt Cubed, 2006). It is also estimated that a typical hourly employee spends 4 h on time theft per week (Cleveland, 2014)—wasting almost 7% of an organisation's annual payroll (Ahmed, 2018)—and that 75% of organisations in the U.S. are suffering time theft (Osterhaus, 2015). Another reason is that employees may easily engage in cyberloafing and time theft (especially during the pandemic) because of the less visible nature of such behaviours (Lim, 2020). Studying these deviant work behaviours has important implications to develop and maintain a productive workforce (Lim & Teo, 2005; Martin et al., 2010; McGee & Fillon, 1995).

Second, prior research, from a static, between-person perspective (e.g. Golden et al., 2008; Wang et al., 2020), provides an incomplete understanding of professional isolation due to the neglect of its dynamic nature. Research has shown that many work-related experiences are dynamic (Taylor et al., 2017) and that *changes* (i.e. decreases or increases) over time have important implications (George & Jones, 2000; Mitchell & James, 2001). Relatedly, scholars have highlighted the importance of changes when studying employee experiences of isolation and the pernicious consequences during abnormal work conditions (Kniffin et al., 2021; Rudolph et al., 2021). To illustrate this, consider two employees who report the same, high levels of professional isolation. All else being equal, one may expect them to report similar levels of negative consequences; however, this snapshot of professional isolation overlooks its change over time. Imagine one person's experience of professional isolation is changing downwardly (e.g. from very high to high), and the other employee is experiencing an upward trend of professional isolation (e.g. from moderate to high). The former employee may react less negatively despite high levels of professional isolation and the latter may react more negatively. Research focussing on the absolute static levels of professional isolation fails to tease out such "rectifying/correctional" properties of downward changes in professional isolation. Professional isolation change has important implications above and beyond the *level* of professional isolation being experienced.

Third, although the negative consequences of professional isolation have been examined (e.g. Golden et al., 2008; Wang et al., 2020), the underlying mechanisms driving such consequences remain unclear. Given these considerations, the present study examines how *changes* in professional isolation affect subsequent *changes* in cyberloafing and time theft from a self-regulation perspective. When people experience professional isolation, they will exert regulatory resources to understand the implications of being isolated, rebuild interpersonal connections and compensate for resource losses, and manage the associated negative emotions and feelings of uncertainty. Exerting regulatory resources can impair one's capacity to engage in subsequent self-regulation processes (Baumeister et al., 2007), a state that is termed *self-control capacity impairment*. According to self-regulation theories (Baumeister et al., 1998; Muraven & Baumeister, 2000), self-control capacity impairment can result in undesirable and deviant behaviours, such as cyberloafing and time theft. Research has shown that cyberloafing and time theft are driven by self-control capacity impairment (Wagner et al., 2012). Taken together, examining the mediating role of self-control capacity impairment could provide important theoretical and practical implications.

In this study, we test our mediating model of professional isolation (Figure 1) using latent change score modelling to analyse data collected from 343 employees across five consecutive weeks at the beginning of the pandemic. By studying cyberloafing and time theft as less visible but costly consequences, this study helps demonstrate the hidden costs of professional isolation and raise people's awareness of it. Further, by employing the advanced method of dynamic mediation modelling (Liu et al., 2016), this research shifts the research focus from a static, between-person perspective to a dynamic, within-person view, deepening our understanding of the temporal dynamics of professional isolation and its implications. This allows us to respond to calls to investigate changes in professional isolation (Kniffin et al., 2021). As part of the initial effort to examine mediating mechanisms through which professional isolation affects employee outcomes (Golden et al., 2008), we also contribute to research by testing a self-regulation perspective in understanding the hidden costs of professional isolation. Given that technologies and artificial intelligence are and will continue to change how work is done even after the pandemic (Lund et al., 2021), testing the mechanisms driving the effects of professional isolation will have implications to reduce professional isolation and its harmful consequences.

THEORETICAL AND CONCEPTUAL BACKGROUND

The implications of changes in professional isolation

Many organisational behaviours and phenomena are explicitly or implicitly dynamic in nature (Dalal & Hughes, 2020; Johnson & Leo, 2020; Taylor et al., 2017). Professional isolation is no exception. Employees experience different situational stimuli that contribute to their experiences of professional isolation (Barker, 1963). These different situational stimuli (e.g. the geographic dispersion and cancelations of in-person meetings) can inform people when professional isolation develops over time. People compare their current and past levels of experiences to understand if and how their professional isolation experiences may have changed

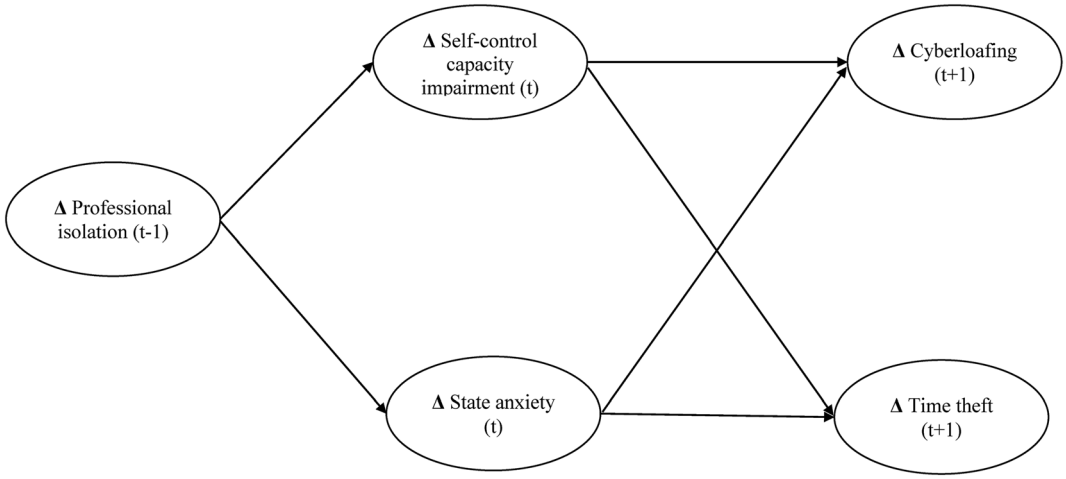

FIGURE 1 Conceptual model of hypothesised relationships between changes in constructs

(Weick, 1995). This temporal dynamism of employee experiences affects their future psychological states and behaviours (Ariely & Carmon, 2003).

Prior studies have mainly focussed on the levels of experienced professional isolation and examined it as a static phenomenon, failing to examine the implications of upward and downward changes in professional isolation. People are mindful of *changes* in professional isolation, and their psychological states and behaviours can be impacted by changes in professional isolation across time (e.g. upward change is more stressful than downward change). Following recent longitudinal studies (Johnson & Leo, 2020; Su et al., 2022; Taylor et al., 2017), we conceptualise change as "the extent to which an individual's perceived level of a dynamic process shifts from one point in time to another (e.g. week to week)" (Taylor et al., 2017, p. 647). The changes in experiences provide meaningful information beyond the static levels of experiences captured in a snapshot (e.g. Hsee & Abelson, 1991). Thus, in this study, we examine how and in what direction professional isolation change affects changes in cyberloafing and time theft behaviours across time.

Self-regulation theories

Self-regulation theories (Baumeister et al., 1998; Johnson et al., 2018; Muraven & Baumeister, 2000) can help explain the possible effects of professional isolation on cyberloafing and time theft through self-control capacity impairment. Self-regulation refers to "processes by which the self intentionally alters its own responses, including thoughts, emotions, impulses, performance and behaviours, based on standards" (Baumeister & Vohs, 2016, p. 70). People usually have a finite pool of self-regulatory resources that can be used to bear on activities that require self-regulation (Baumeister et al., 1998; Muraven & Baumeister, 2000). When people deplete self-regulatory resources, they will experience self-control capacity impairment, a state of not being able to regulate or control their behaviours, attention, emotions, mental states, or impulses (Muraven & Baumeister, 2000; Zhang et al., 2022). According to self-regulation theories, when individuals experience self-control capacity impairment, they are less likely to resist temptations and more likely to engage in impulsive and deviant behaviours that may bring short-term pleasure but long-term costs (Baumeister, 2002; Zhang et al., 2022).

Although prior research employing self-regulation theories has rarely examined dynamic changes in self-regulation processes (see an exception by Johnson & Leo, 2020), scholars have noted that self-regulation theories are by nature dynamic (Dalal & Hughes, 2020). Within the dynamic self-regulation processes, it is *change* in work-related experiences that can lead to *change* in employees' self-control capacity impairment, which in turn, results in *changes* in impulsive and deviant behaviours that require self-regulation. As such, it is important to consider temporal changes in self-regulation (Mitchell & James, 2001). Extending past research, our focus on change allows us to reveal findings that diverge from taking a static view of self-regulation.

Changes in profession isolation and self-control capacity impairment

Professional isolation reflects "a state of mind that one is out of touch with others in the workplace" (Golden et al., 2008, p. 1412). It shows a lack of social connectedness and insufficient access to "critical networks of influence and social contact" (Miller, 1975, p. 261).

Professional isolation undermines self-regulation and results in individuals' self-control capacity impairment for three reasons. First, an overarching purpose of self-regulation is to secure and maintain social connections (Baumeister et al., 2005). Increases in isolation experiences indicate that employees are more frequently placed into situations where they need to exert regulatory resources to restore and regain social connectedness. According to Baumeister, Vohs and Tice (2007), exerting regulatory resources impairs one's capacity in future self-regulation processes. Thus, increases in professional isolation result in greater impairment in self-control capacity. In contrast, decreases in professional isolation signal that situations are improving and fewer regulatory resources are needed, resulting in the recovery of self-control capacity.

Second, professional isolation is characterised by its link to employee career development (Cooper & Kurland, 2002). Employees experiencing professional isolation tend to perceive that both tangible (e.g. equipment) and intangible (e.g. social support) resources are lacking (Cooper & Kurland, 2002; Golden et al., 2008). Due to the constrained interpersonal interactions and the salient changes in their typical work patterns at the beginning of the pandemic, employees may have experienced difficulties in getting informal mentoring and performance feedback from coworkers and supervisors. Isolated employees may have also missed the typical behavioural cues, standards and referents from important others at work (Cooper & Kurland, 2002; Golden, 2007). As professional isolation keeps increasing, employees feel that they continue to lose those tangible and intangible resources that are important to their career development. Forced to exert more regulatory resources to rebuild interpersonal connections and compensate for resource losses, employees may experience greater impairment in their self-control capacity. In contrast, decreases in professional isolation imply that work- and career development-related resources are recovering. Employees may have less need to over-expend regulatory resources to process their work environment and understand the potential implications, contributing to less impairment in their self-control capacity.

Third, professional isolation is related to negative emotional feelings and uncertainties (Cooper & Kurland, 2002; Gao & Sai, 2020; Golden, 2007). Professionally isolated employees exert regulatory resources to manage and suppress negative emotional feelings (Gao & Sai, 2020), which can lead to further impairment in self-control capacity (e.g. Wang et al., 2019; Yam et al., 2016). Baumeister et al. (2007) showed that exerting emotion regulation can impair one's ability to engage in subsequent self-regulatory processes. Employees facing isolation during the COVID-19 pandemic specifically may have also needed to deal with the uncertainties from an unstructured and unclear work environment forced on them at the beginning of the pandemic (Gao & Sai, 2020). They could find it difficult to determine how they should behave or respond to work events because of the lack of "social barometers" (Golden et al., 2008; Vega, 2003). The lack of appropriate in-depth interpersonal interactions limits the insights, information and feedback they could have received from others to perform work activities, resulting in greater uncertainties (Golden et al., 2008). Employees need to devote extra regulatory resources to manage uncertainties about how to do their work or about what the future may bring (Johnson et al., 2018), resulting in self-control capacity impairment. Upward changes in isolation bring increasing negative emotions and uncertainties that tax employees' regulatory resources, resulting in greater self-control capacity impairment. In contrast, downward changes suggest that negative emotions and feelings of uncertainties are declining, allowing employees to preserve regulatory resources and thus experience less impairment in their self-control capacity.

Hypothesis 1. Upward (vs. downward) change in professional isolation will be positively related to subsequent upward (vs. downward) change in self-control capacity impairment.

Changes in profession isolation, self-control capacity impairment, cyberloafing and time theft

Self-regulation theories suggest that individuals with impaired self-control capacity are less likely to resist temptations and desire and are thus more likely to engage in impulsive and deviant behaviours that bring short-term pleasure but long-term costs (Baumeister, 2002; Baumeister & Vohs, 2007; Zhang et al., 2022). With increased impairment in self-control capacity, employees have fewer regulatory resources with which to control themselves and execute self-discipline. We predict that upward changes in self-control capacity impairment are positively related to upward changes in cyberloafing and time theft because of the following reasons.

First, cyberloafing and time theft usually involve less visible but deviant behaviours, such as surfing the internet for entertainment and working on personal matters during work time. These behaviours may bring immediate pleasures and benefits (Lim & Teo, 2005; McGee & Fillon, 1995), but they are not up to one's work standard. Employees with more self-regulation resources can resist these behaviours and focus on their work tasks. In contrast, employees with impaired self-control capacity are less likely to resist temptations and inhibit subpar work behaviours (Baumeister et al., 2005, 2006; DeWall et al., 2007). Research has found that employees with impaired self-control capacity are more likely to exhibit deviant work behaviours (e.g. abuse; Yam et al., 2016). They also have more impulsive purchasing and overused their mobile phones during non-work time (Zhang et al., 2022). Thus, increases in self-control capacity impairment will be positively related to increases in cyberloafing and time theft.

Second, people with impaired self-control capacity are less likely to be aware of or monitor their behaviours (Baumeister & Vohs, 2007). Whilst self-control capacity impairment increases, employees have fewer resources to be cognizant of their current behaviours or the time-lapse on behaviours such as surfing the internet and dealing with personal matters during work time. They also have diminished self-control capacities to analyse the long-term costs of these behaviours. For example, they may not be fully aware that engaging in these behaviours violates normative expectations and impacts their work productivity. With increased self-control capacity impairment, employees are less likely to monitor and correct their behaviours that are not up to their organisation's standard of work. In contrast, when self-control capacity impairment halts or decreases, employees can experience a break in self-depletion and some recovery in self-control capacity. These regained resources could help them monitor, evaluate and adjust their work behaviours to be more aligned with work standards and their own long-term goals.

Based on the above theoretical and empirical foundations, we expect that with increases in self-control capacity impairment, people will be increasingly less able to resist temptations and monitor their behaviours and recognise the associated consequences (Baumeister et al., 2005; Baumeister & Vohs, 2007). As such, increases in cyberloafing and time theft will occur.

Hypothesis 2. Upward (vs. downward) change in self-control capacity impairment will be positively related to subsequent upward (vs. downward) changes in (2a) cyberloafing and (2b) time theft.

Dynamic mediated process

Based on H1 and H2, we expect that changes in self-control capacity impairment will mediate the effects of professional isolation change on the subsequent changes in cyberloafing and time theft (Figure 1). Research has supported that self-control capacity impairment is an important mechanism that explains various behavioural consequences when people's self-regulatory resources are depleted because of a variety of job stressors (Joanna Lin & Johnson, 2015; Yam et al., 2016; Zhang et al., 2022). From a dynamic perspective, upward changes in professional isolation may prompt employees to extrapolate from their increasing isolation experiences and perceive that their social connections, work- and career development-related support, negative emotions, and feelings of uncertainties are worsening (Ariely & Carmon, 2003), which may in turn increase the degree to which they experience self-control capacity impairment. Consequently, this diminished capacity could worsen their ability to refrain from temptations and be aware of their behaviours and the related consequences, prompting subsequent increases in cyberloafing and time theft. Therefore, we hypothesise that:

Hypothesis 3. Upward (vs. downward) change in professional isolation will indirectly affect subsequent upward (vs. downward) changes in cyberloafing (3a) and time theft (3b) via an intermediating upward (vs. downward) change in self-control capacity impairment.

METHOD

Participants and procedure

The recruitment of participants occurred in two different stages via TurkPrime. We recruited participants with a current approval rating on Mechanical Turk (MTurk) of 80% or greater coupled with completion of at least 100 prior tasks on MTurk. First, 993 U.S.-based MTurk workers completed a 2-min anonymous online screening survey on 19 March 2020. This survey largely functioned as a preliminary background survey collecting information on participants' employment status and primary language. All participants received $0.20 in compensation. Owing to the purpose of the study, we screened qualified participants who worked at least 20 h per week in a traditional organisational setting (i.e. outside of the MTurk platform, non-freelancers and non-traditional teleworkers),[1] indicated that they have a supervisor at work, and commuted to a work site regularly before the outbreak of COVID-19. Among these 993 MTurk workers, 33 did not pass the language check (i.e. participants were instructed to choose the synonym for famous from four options: friendly, considerate, well-known and confident). We found that 275 were not working in a traditional organisational setting, 59 were freelancers, 12 primarily relied on MTurk income and 17 did not have a supervisor. After excluding

them, a total of 530 workers were further invited to participate in our formal background survey during the week prior to the start of the weekly surveys (March 20–22, 2020), which included the consent form, demographic and job-related questions.

A total of 434 workers participated in our formal background survey and received $1.00 in compensation. After excluding (a) participants who missed any attention check out of two total, (b) those who did not finish the survey and (c) those who were not available to participate in later weekly diary surveys, we achieved a final sample of 420 participants for our weekly surveys. The weekly surveys were conducted at the end of each consecutive work week for 5 weeks. For each completed weekly survey, the participants received $1.00 in compensation. Data from the first weekly survey were collected in the first work week after the numerous closures and shutdowns because of the COVID-19 outbreak in the United States (23–27 March 2020). Overall, 370 workers filled out the weekly surveys. Among these, 11 completed one weekly survey, 12 completed two weekly surveys, and four reported a job change during the 5-week period. To ensure a sufficient amount of within-person fluctuations, we retained only the data from 343 workers who completed at least three out of five weekly surveys, resulting in 1649 valid responses. The mean age, work hours per week and years worked in the current organisation were 37.84 ($SD = 10.13$), 40.50 ($SD = 5.42$) and 7.05 ($SD = 6.04$), respectively. The average number of children aged 18 and under living in the household was 1.80 ($SD = 1.19$), and 64% were married or living with a partner. The majority were female (52%), white (75%), did not have supervisory responsibilities (67%) and had at least a bachelor's degree (77%).

Measures

All study variables were measured using established measures (Appendix 3A). The weekly measures were assessed with a 1-week frame of reference. All measures used a 5-point response format (1 = *never* to 5 = *most of the time*) unless otherwise indicated.

Professional isolation

Golden et al.'s (2008) 7-item scale was used to assess professional isolation during each week. Example items include "This week, I missed face-to-face contact with coworkers", "This week, I felt left out on activities and meetings that could enhance my career" and "This week, I missed out on opportunities to be mentored". The participants were instructed to respond to the items based on their feelings in their current work situations on a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*). Across the five surveyed weeks, the mean Cronbach's alpha was .90 (range = .89–.91).

Self-control capacity impairment

We used a 5-item scale adapted by Joanna Lin and Johnson (2015) from the State Self-control Capacity Scale (Twenge et al., 2003) to measure self-control capacity impairment. Example items include "This week, I felt drained" and "This week, I felt like my will power was gone". The participants were asked to indicate the extent to which they had each experience on a 5-point scale (1 = *very slightly or not at all* to 5 = *extremely*). Across the five surveyed weeks, the mean Cronbach's alpha was .95 (range = .94–.96).

Cyberloafing

We selected seven items from recent literature to measure cyberloafing behaviours that are relevant to the study context (Cheng et al., 2020; Lim, 2002; Lim & Teo, 2005). All items started with the same stem of "During work hours of this week." Example items include "I read or sent non-work-related e-mails" and "I surfed the net and so escaped a little." Across the 5 weeks, the mean Cronbach's alpha was .90 (range = .88–.91).

Time theft

We used a three-item scale adapted by Lorinkova and Perry (2017) from the Workplace Deviance Scale (Bennett & Robinson, 2000). Measurement items also started with the same stem of "During work hours of this week". Sample items include "I worked on a personal matter instead of working for my employer" and "I spent too much time fantasising or daydreaming at the job". The mean Cronbach's alpha was .82 (range = .81–.85).

Control variable

We controlled for state anxiety when testing the mediating effect of self-control capacity impairment because of the possible confounding effect of state anxiety. Anxiety is characterised by a sense of worry (Lazarus & Lazarus, 1994). Professional isolation is marked by a level of uncertainty and ambiguity (Vega, 2003), which may elicit employees' experiences of state anxiety. Research has linked state anxiety to professional isolation (e.g. Baumeister & Tice, 1990; Golden et al., 2008), self-control capacity impairment (Johnson et al., 2018) and deviant work behaviours (Bauer & Spector, 2015). Research also suggests that negative affective states, including state anxiety, could be an alternative mechanism through which employees engage in a variety of maladaptive behaviours (e.g. mobile phone overuse; Johnson et al., 2018; Liu et al., 2016; Zhang et al., 2022). As such, we controlled the mediating effect of change in state anxiety when testing the unique mediating role of change in self-control capacity impairment. The anxiety scale from Caplan et al. (1975) was used to measure anxiety. Example items include "This week, I felt nervous", "This week, I felt jittery" and "This week, I felt calm (reverse coded)". The participants were instructed to indicate the extent to which they agreed with each of the statements on a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*). The mean Cronbach's alpha was .87 (range = .85–.88).

Analytical approach

Testing the measurement model and the temporal invariance

We first tested the measurement model using confirmatory factor analyses with robust full information maximum likelihood (FIML) estimation to examine the discriminant validities of study constructs. We then tested measurement invariance (e.g. Ritter et al., 2016) by placing equality constraints on factor loadings of indicators over time (McArdle, 2009; Selig & Preacher, 2009).

Latent change score (LCS) model

We employed the multivariate LCS model to examine the change processes among multiple dynamic constructs using Mplus 8.0 (Muthén & Muthén, 1998–2017). We used the FIML estimation to handle missing data (e.g. Newman, 2014). Previous studies discussed the LCS modelling in detail and showed its advantages over some other traditional approaches for analysing longitudinal data (Ferrer & McArdle, 2010; Grimm et al., 2012; Liu et al., 2016; McArdle, 2009; Selig & Preacher, 2009). LCS models decompose change into different components and allow us to account for multiple sources of variability (e.g. constant changes, proportional changes and level-to-change effects). The multivariate LCS model (see Figure 2) helps us test multiple dynamic mediated processes with multiple constructs simultaneously (Johnson & Leo, 2020; Taylor et al., 2017). To test the hypotheses, we examined the significance of bivariate change-to-change parameters whilst controlling for other sources of variability. The indirect effects were examined via the bias-corrected (BC) bootstrapped confidence intervals (CI) (Selig & Preacher, 2009) with 5000 bootstrapped samples.

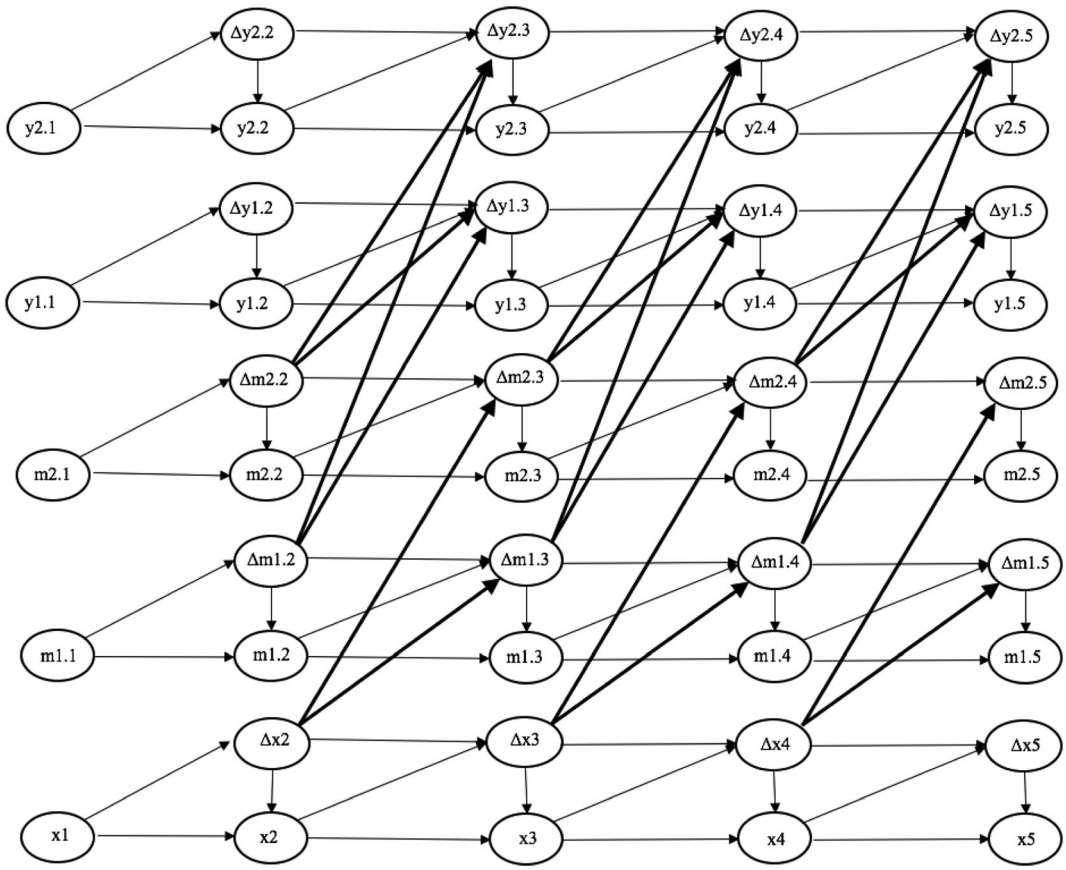

FIGURE 2 Latent change score model. Δx = professional isolation change, $\Delta m1$ = self-control capacity impairment change, $\Delta m2$ = state anxiety change, $\Delta y1$ = cyberloafing change, Δy = time theft change. Bivariate change-to-change paths reflect hypothesised relationships and are shown with bolded lines. For clarity, bivariate level-to-change paths, between-construct correlations, the measurement model of each construct, latent intercepts, latent slopes, and their paths and covariances are not shown

RESULTS

Table 1 reports descriptive statistics and correlations of the study variables.

Preliminary results

Discriminant validity

For each data wave, omnibus confirmatory factor analyses were conducted to compare the expected five-factor measurement model (i.e. professional isolation, self-control capacity impairment, state anxiety, cyberloafing and time theft) with a series of alternative models. The model fit of the five-factor model was slightly below Hu and Bentler's (1999) conservative two-index presentation criteria for good model fit. However, comparisons with alternative models (Tables A1 and A2 in the online supporting information) suggested that this model fit the data best. All items loaded significantly ($p < .01$) on corresponding factors.[2]

Test of temporal invariance

We further examined the temporal invariance of our measures by comparing the model with free loadings with the model with loadings of each indicator constrained to be equal over time. The results of the longitudinal measurement invariance tests found that metric invariance was supported for each measure (Table A1). It should be noted that although the model fit of the unconstrained model of professional isolation was slightly below Hu and Bentler's (1999) conservative two-index presentation criteria, the constrained model did not fit the data worse than the unconstrained model.

Professional isolation change over the course of the first month of the pandemic

Following Ritter et al. (2016), we created Figure 3 to display the predicted patterns of change in professional isolation at different initial levels: the middle solid line was when the initial professional isolation was at the mean; the upper dash line was when the initial professional isolation

TABLE 1 Descriptive statistics and correlations among study variables

Variables	$M_{(w)}$	$SD_{(w)}$	$M_{(b)}$	$SD_{(b)}$	1	2	3	3	4
1. Professional isolation	2.78	.49	2.78	.85	-	.40*	.43*	.20*	.30*
2. Self-control capacity impairment	2.25	.60	2.26	.92	.35*	-	.69*	.39*	.50*
3. State anxiety	2.59	.60	2.59	.81	.36*	.60*	-	.22*	.30*
4. Cyberloafing	2.34	.41	2.35	.75	.19*	.35*	.19*	-	.81*
5. Time theft	2.39	.52	2.40	.81	.27*	.44*	.24*	.72*	-

Note: Correlations above the diagonal represent between-individual scores, that is, individuals mean variables ($n = 343$). Correlations below the diagonal represent within-individual scores, that is, individual-mean variables, based on the 5-week responses ($n = 1649$).
*$p < .01$.

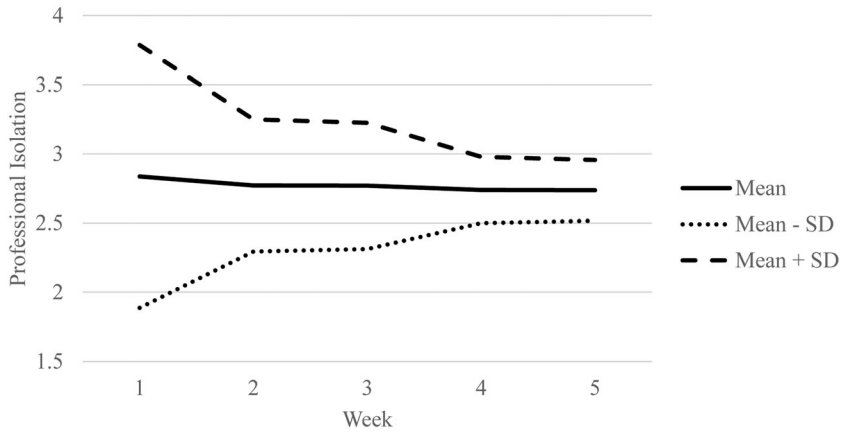

FIGURE 3 Predicted pattern of change over time for professional isolation at different initial levels

was at the 1 *SD* above the mean; the lower dotted line was when the initial professional isolation was at the 1 *SD* below the mean. The trajectories were not smooth in that they might decrease or increase at different rates over time; if the person's professional isolation recently decreased (or increased) quickly, then subsequent weekly declines (or increments) in professional isolation occurred at a slower rate. In general, there was a trend of decelerating rates of change over time until recovering to mean levels.

Hypotheses testing

As mentioned above, we applied the multivariate LCS model (see Figure 2) to examine the relationships between changes in professional isolation, self-control capacity impairment, state anxiety, cyberloafing and time theft over time. The multivariate LCS model had a good fit to the data ($\chi^2 = 599.55$, $df = 258$, comparative fit index = .96, Tucker–Lewis index = .95, root-mean-square error of approximation = .06, standardized root-mean-square residual = .03).

Process via change in self-control capacity impairment

As shown in Table 2, professional isolation change was positively related to subsequent change in self-control capacity impairment ($\xi = 1.29$, SE = .51, $p < .05$), supporting Hypothesis 1. Additionally, although not hypothesised, the level of professional isolation at the previous period was positively associated with changes in self-control capacity impairment ($\xi = .05$, SE = .02, $p < .05$). Further, supporting Hypotheses 2a and 2b, changes in self-control capacity impairment were positively related to subsequent changes in cyberloafing ($\xi = 1.49$, SE = .37, $p < .01$) and time theft ($\xi = 1.74$, SE = .55, $p < .01$). The level of self-control capacity impairment was not significantly related to subsequent changes in cyberloafing ($\xi = .02$, SE = .05, *ns*) and time theft ($\xi = -.01$, SE = .07, *ns*).

The significance of the indirect effects was determined by whether the 95% BC bootstrapped CI excluded zero or not. Supporting Hypotheses 3a and 3b, the indirect effects of professional isolation change on changes in cyberloafing (indirect effect = 1.92, 95% BC CI = [1.30, 3.29])

TABLE 2 Estimated bivariate path coefficients for the latent change score model

Predictor	Change in self-control capacity impairment	Change in state anxiety	Change in cyberloafing	Change in time theft
Level of professional isolation	.05 (.02)*	.05 (.02)*		
Change in professional isolation	**1.29 (.51)***	−1.09 (.58)		
Level of self-control capacity impairment			.02 (.05)	−.01 (.07)
Change in self-control capacity impairment			**1.49 (.37)****	**1.74 (.55)****
Level of state anxiety			.08 (.05)	.14 (.07)
Change in state anxiety			1.50 (.40)**	2.45 (.61)**

Note: Unstandardised coefficients of bivariate paths in the LCS model are reported, with standard errors in parentheses. Coefficients related to hypotheses are bolded. The unbolded coefficients represented controlled sources of variabilities, that is, the level-to-change effect or the process via state anxiety.

*$p < .05$.

**$p < .01$.

and time theft (indirect effect = 2.25, 95% BC CI = [1.47, 3.43]) via change in self-control capacity impairment were significant.

Process via change in state anxiety

As shown in Table 2, the relationship between professional isolation change and subsequent state anxiety change was not significant ($\xi = -1.09$, SE = .58, *ns*), although state anxiety change was positively related to subsequent changes in cyberloafing ($\xi = 1.50$, SE = .40, $p < .01$) and time theft ($\xi = 2.45$, SE = .61, $p < .01$). Taken together, state anxiety change did not serve as an alternative mediator between professional isolation change and changes in cyberloafing and time theft.

DISCUSSION

The findings of the current research extend the literature in several ways. First, we extend the limited research on work-related behavioural outcomes of professional isolation. So far existing research has found that professional isolation negatively impacts discernible work-related outcomes (e.g. job performance and turnover) and employee job attitudes (e.g. Golden et al., 2008; Mulki & Jaramillo, 2011; Spilker & Breaugh, 2021); our results show that professional isolation also affects those less visible but costly work outcomes (e.g. cyberloafing and time theft). Hence, our findings provide a broader view of what is impacted by an employees' experience of professional isolation. The current findings set the stage for a new and more comprehensive understanding of how the performance costs of professional isolation extend beyond the discernible work outcomes. This study also echoed

recent calls for research on the harmful consequences of professional isolation in times of crisis (Rudolph et al., 2021).

Second, we contribute to research on professional isolation by extending the current research focus on the static experience of isolation to dynamic *changes* in professional isolation. Our findings demonstrate that employees facing upward changes in professional isolation experience greater impairment in self-control capacity and those perceiving downward change in professional isolation experience self-control capacity impairment to a lesser extent. These rectifying/correctional properties of downward changes in professional isolation enhanced our understanding of temporal changes in professional isolation, suggesting that a reduction in professional isolation across weeks may reverse the trajectory of self-control capacity impairment changes. We suggest that the direction and magnitude of professional isolation change have meaningful consequences, above and beyond the static levels of professional isolation. Thus, if researchers consider only the level of professional isolation at one point in time, which is common in the literature (e.g. Golden et al., 2008; Wang et al., 2020), they cannot understand the full impact of professional isolation, especially for individuals with high professional isolation followed by a downward change or individuals whose initial professional isolation is low but experience an upward change. The significant effects of professional isolation change lend clear support to the value of investigating intra-individual changes in employee work-related experiences (e.g. Mitchell & James, 2001; Taylor et al., 2017), especially during a time when people are facing abrupt interruptions in their work-life (Kniffin et al., 2021; Rudolph et al., 2021).

It should be noted that changes in cyberloafing ($\xi = .02$, SE = .05, *ns*) and time theft ($\xi = -.01$, SE = .07, *ns*) were not predicted by the level of employees' self-control capacity impairment but by its change. Thus, if scholars only measure the level of self-regulatory resources at one point in time and examine the static, between-person level relationship, they may fail to understand the effect of self-control capacity impairment on employee deviance and make erroneous conclusions. As such, compared to a static view, a temporal view of studying changes enables researchers to better understand the dynamism of employees' self-regulation processes and the associated consequences (e.g. Dalal & Hughes, 2020; Johnson et al., 2018; Mitchell & James, 2001).

Finally, the literature so far has not provided a solid explanation as to why professional isolation negatively impacts employee outcomes. We suggest that self-regulation theories hold significant promise as a perspective in understanding the harmful consequences of professional isolation. For instance, recent research has shown that impulsive buying can be driven by self-control capacity impairment (Zhang et al., 2022). Thus, it is possible that employees experiencing professional isolation may engage in impulsive buying simply because they, as a result of using self-regulatory resources to deal with feelings of being professionally isolated, lack the self-control capacity needed to resist temptations and impulses. Self-regulation theories can thus increase our understanding of the effects of professional isolation and open doors to a variety of previously unexamined consequences of professional isolation (e.g. impulsive buying). Further, past cross-sectional research might suffer from substantial bias (e.g. biased estimates of the direct and indirect effect) in testing mediated relationships (Maxwell et al., 2011). By examining the latent change-based mediation effects, we offer an important empirical contribution to the literature by applying an advanced method of dynamic mediation modelling to test the inherent dynamics in individuals' self-regulation processes (Liu et al., 2016) and illustrating the temporal dynamics of employee professional isolation experiences across time.

Practical implications

The results clearly show that in the early stage of the COVID-19 outbreak in the United States, employees experienced changes in professional isolation, and such changes have important implications for their work behaviours. It is important for organisations to be aware of the hidden performance costs of professional isolation during and beyond times of crisis. Importantly, organisations should pay special attention to employee experiences of increasing professional isolation and its associated self-control capacity impairment change over time. To protect employee productivity, organisations may allocate sustained efforts, rather than one-time efforts, to mitigate employees' feelings of professional isolation. Practitioners may consider more proactively and frequently initiating programmes to help employees cope with professional isolation. For example, to enhance interpersonal connections among employees, organisations may try to structure activities between coworkers to allow sufficient levels of task and affective exchanges between them (Golden, 2007; Golden et al., 2008). Human resource practitioners could design jobs (e.g. virtual teamwork) in a way that involves interaction among employees in important organisational functions (Golden et al., 2008). Importantly, given the various challenges brought by such a nationwide crisis, organisations could encourage employees to share knowledge, skills and experiences that are important to their career development. Through such consistent and frequent initiatives, the trajectory of professional isolation may be improved or changed less dramatically.

Furthermore, given the critical role of changes in self-control capacity impairment, organisations may initiate interventions that have been demonstrated to improve self-control capacity (e.g. Baumeister et al., 2006; Gailliot et al., 2007). Consistent with the idea that self-regulatory resources may function like a muscle, organisations can promote frequent use of such interventions to recover and enhance employees' self-control capacity. Specifically, employees can be offered opportunities to learn how to cope with quarantine periods, share experiences and effectively communicate with others (e.g. virtual reality techniques; Rudolph et al., 2021).

Limitations and future research directions

Despite the implications of the present research, there are limitations to be noted. First, this study primarily relies upon self-report data, which might be impacted by common method variance (Podsakoff et al., 2003). However, because professional isolation and self-control capacity impairment reflect individuals' subjective feelings and perceptions of their internal psychological states, self-report may be appropriate (Chan, 2009). Also, it has been shown that self-report measures of deviant behaviours (e.g. time theft) are valid and viable alternatives to other reports and can capture a broader range of negative behaviours (e.g. Berry et al., 2012). Nevertheless, alternative measures, such as archival data (e.g. computerised performance monitoring data), could be used to test our hypothesised relationships.

Second, because our study examined professional isolation in the early stage of the COVID-19 outbreak, it remains unknown what long-term consequences of professional isolation may occur over time. For instance, major changes in psychological well-being (e.g. depression), physical health and health-related behaviours (e.g. physical exercise) might be observed in the

long run. Relatedly, given the disruptions and uncertainties caused by COVID-19, people may have experienced more changes in professional isolation in the early stage of the pandemic (i.e. from mid-March to late April 2020) than later in the pandemic or during a non-pandemic period. This possibly strengthened the depleting effect of professional isolation and its effects on employee work behaviours. However, as there is no clear end to COVID-19 (e.g. the new variants), many of our social interactions are still constrained. Remote work or mixed work arrangement options still and will continue to exist. As such, employees' experiences of professional isolation might be an important issue to be considered not only during crises but also after crises. Future research could investigate whether and how employees can adapt to professional isolation over time.

Furthermore, although our study proposed three ways (i.e. lack of social connection, limited career development resources and negative emotions) through which change in professional isolation would be related to change in self-control capacity, we did not collect data to empirically test any of these potential mechanisms. To explicate exactly the ways in which professional isolation change can result in changes in self-control capacity, future research could further test these three mediating mechanisms. It would be theoretically meaningful to investigate whether they exercise similar or different influences in linking professional isolation change to self-control capacity change.[3]

Additionally, as part of our initial efforts to raise awareness of professional isolation during the pandemic, we only examined cyberloafing and time theft as subtle but costly behavioural consequences of professional isolation. We did this with the belief that identifying these less visible but important work consequences of professional isolation could promote organisations' interest in developing relevant policies and practices to help employees. However, there are other outcomes deserving closer attention in the long run. Relatedly, because remote work and hybrid work arrangements have blurred the work-life boundary for many employees, especially during the early stage of the pandemic (Hennekam et al., 2021), people may see cyberloafing and time theft as a way to re-establish the balance between work and non-work domains (Mercado et al., 2017). They may rationalise their cyberloafing and time theft behaviours during work time because they spent extra time working at home. Future research could explore the mechanisms behind employees' engagement in cyberloafing and time theft in such situations.

Finally, although we framed cyberloafing as an "impulsive but negative behaviour" that is undesirable (from the employer's perspective), certain forms of cyberloafing could allow employees to engage in some social interactions and help them recharge while they are experiencing professional isolation. Cyberloafing can be beneficial to employees' stress coping and mental health (Andel et al., 2019; Wu et al., 2020). Future research may examine whether certain forms of cyberloafing may actually help counter employees' feelings of professional isolation and benefit their health and well-being in the long run.

CONFLICT OF INTEREST

The author(s) declared that there were no conflicts of interest with respect to the authorship or the publication of this article.

ETHICS STATEMENT

All data was collected in a way consistent with the APA ethical principles regarding research with human participants.

DATA AVAILABILITY STATEMENT

Data available on request from the authors.

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ENDNOTES

[1] Researchers typically choose to recruit employees who work for at least 20 h per week to ensure a more job-relevant sample (Kluemper et al., 2009). As such, we followed other colleagues to recruit workers from Mturk who reported working at least 20 h per week (McGonagle et al., 2016), particularly considering the existence of a large group of Mturk workers with a wide range of work hours per week.

[2] Based on reviewers' suggestion, we followed prior research (Liao et al., 2021) to conduct a multilevel CFA using Dyer, Hanges and Hall's (2005) approach. To achieve a more optimal variable-to-sample-size ratio and minimise parameter estimate instability (Bagozzi & Edwards, 1998; Little et al., 2002), we randomly assigned items into three-item parcels for variables (i.e., professional isolation and cyberloafing) measured with more than five items. Results showed that the hypothesised five-factor baseline model composed of professional isolation, self-control capacity impairment, state anxiety, cyberloafing and time theft fit the data well ($\chi^2 = 881.86$, $df = 250$, comparative fit index = .95, Tucker–Lewis index = .94, root-mean-square error of approximation = .04, standardized root-mean-square residual $_{within}$ = .04; standardized root-mean-square residual $_{between}$ = .05). These results suggest that the factor structure of the hypothesised model is consistent across the between-person and within-person levels.

[3] We would like to thank our reviewers for this suggestion.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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