

Disruptive pandemic effects on telecommuters: A longitudinal study of work–family balance and well-being during COVID-19

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Abstract

We examined the disruptive influence of COVID-19 pandemic rates in the community on telecommuters' satisfaction with balancing their work and family roles and consequently their well-being. Utilizing event system theory and adaptation theory, we proposed that the rate of increase in proportion of confirmed COVID-19 cases in telecommuters' residential communities would predict a lower rate of increase in their satisfaction with work–family balance over time, thereby indirectly influencing two key aspects of well-being—emotional exhaustion and life satisfaction. Results from latent growth curve modeling using objective community data, as well as survey responses from a three-wave ($N = 349$) panel study of telecommuters in the United States, indicated that rate of increase in the proportion of confirmed COVID-19 cases in communities was negatively associated with the rate of increase in satisfaction with work–family balance, which translated into decreasing levels of well-being over time. We discuss the theoretical and practical implications of these findings.

KEYWORDS

COVID-19 pandemic, disruption, telecommuting, well-being, work–family balance

INTRODUCTION

Confronted with the health and safety threat posed by the COVID-19 pandemic, a majority of employed adults in the United States switched to remote work by mid-April 2020 (approximately 60%; Gallup Panel, 2020) compared with the pre-pandemic telecommuting figures of 16.6% (Bureau of Labor Statistics, 2019). However, these “pandemic telecommuters” had to simultaneously adapt to extended quarantines that limited social interactions, increased caregiving responsibilities (Lin & Meissner, 2020), and high levels of financial, health, and job insecurity (Caldas et al., 2021; Fu et al., 2021). Although there is pre-pandemic evidence demonstrating the benefits of telecommuting on employee well-being including lower levels of work-related stress and exhaustion, as well as higher levels of affective well-being (Anderson et al., 2015; Charalampous et al., 2019; Gajendran & Harrison, 2007), the COVID-19 pandemic threatened health and disrupted the management of daily work and life routines, thereby potentially curtailing the well-being benefits of working from home (Carnevale & Hatak, 2020).

Utilizing event system theory (Morgeson et al., 2015) and adaptation theory (Diener et al., 2006; Lyubomirsky, 2011), we propose that COVID-19 pandemic was a dynamic environmental event accompanied by various work and life changes that disrupted the adaptation process, including recalibrating the ways in which telecommuters regulated the demands of work and family (Gajendran & Harrison, 2007). In this study, we focus on the direct effects of changing levels of severity of COVID-19 on the trajectory of satisfaction with work–family balance (SWFB), or the evaluation of how one has managed the time and energy devoted to work and family roles (Valcour, 2007), and thereafter, trajectories of two key aspects of psychological well-being—emotional exhaustion (Maslach & Jackson, 1984) and life satisfaction (Diener, 1984). Emotional exhaustion represents a negative psychological state that primarily results from continuous exposure to various demands (Shirom, 1989), whereas life satisfaction is a positive indicator of well-being, which represents one's subjective evaluation of life in general (i.e., considering all life domains; Diener, 1984).

The contributions of this study are threefold. First, we captured the experiences of a large section of the US working population that was thrust into the new work arrangement of telecommuting without a choice, for an unanticipated time period, often lacking the experience needed to rapidly adjust to the new ways of working, that is, lack of perceived control (Rothbaum et al., 1982) and mastery (Pearlin & Schooler, 1978) over the life event. Previous research on work–family interface in the telecommuting context typically used samples of workers who retained the discretion to opt in or out of this arrangement, thereby mostly demonstrating positive work–family and well-being outcomes (Charalampous et al., 2019; Gajendran & Harrison, 2007). However, our study captures the SWFB and well-being evaluations of workers who were in the process of adapting to telecommuting, thus providing insights into changes in their satisfaction with work–family balance in the aftermath of a critical environmental disruption. Therefore, this study extends the literature on disruptive events and extraorganizational stressors (e.g., Byron & Peterson, 2002; Donnelly & Proctor-Thomson, 2015; Hochwarter et al., 2008) by both modeling the changing nature of the disruptions and examining the effects of these disruptions on telecommuters. To accomplish this, we utilized a longitudinal dataset and examined the effect of the COVID-19 pandemic as an event that disrupted telecommuters' experiences of boundary management and well-being.

Second, extending the literature examining the influence of work–family balance on well-being at a *point* in time (e.g., Grawitch et al., 2013; Haar et al., 2014), we answered previous calls for testing the dynamic quality of work–family balance and satisfaction across time by

designing and testing “strong hypotheses” that associated changes in these variables with changes in their respective outcomes over time using latent growth modeling (Casper et al., 2007; Pitariu & Ployhart, 2010). In our sample, telecommuters experienced different rates of change in their levels of SWFB and well-being—a significant portion of which could be attributed to the disruptions in the management of demands from both work and family domains due to COVID-19 severity in their community. We were able to capture these dynamic patterns in our study by examining the impact of rate of change in COVID-19 severity on within-person changes in SWFB and well-being outcomes over time.

Finally, unlike other studies that have investigated disruptive effects on work outcomes after the occurrence and cessation of the event (e.g., Brooks et al., 2018; Hochwarter et al., 2008), we conducted this study at the point that COVID-19 was on its upward trajectory within the United States, that is, from mid-April to early May 2020, and stay-at-home orders were issued across the nation. This allowed us to capture workers' experiences early in their transition to telecommuting, substantially ruling out retrospective sensemaking. We provide the theoretical underpinnings of this study in the following section.

THEORY AND HYPOTHESES

Event system theory

Events can be described as discrete and exogenous time- and space-bound episodes that can alter the behaviors of individuals and groups (Allport, 1967). Because these are time-bound, events have a start and finish; being space-bound, they occur within a specific location; and as a result of being exogenous (external to the person and the organization), events can influence variations in experiences (e.g., different people might experience the same event at varying degrees of intensity). The COVID-19 pandemic can be considered an exogenous event with top-down effects on work-related perceptions, attitudes, and behaviors. In this sense, pandemic influences can be considered acute extraorganizational stressors—unexpected events outside of one's organization that cause unpleasant psychological reactions (Biggs et al., 2014; Byron & Peterson, 2002; Hochwarter et al., 2008). According to the event system theory, the strength of an event lies in a combination of its novelty or unexpectedness, level of disruptiveness, and criticality or importance; such that “the more novel (disruptive, critical) an event, the more likely it will change or create behaviors, features, and events” (Morgeson et al., 2015, pp. 521–522). We argue that the COVID-19 pandemic was a particularly strong event because of the intensity of all three characteristics. Its appearance and scale were unexpected, and the lack of a vaccine or cure during the study timeline was an indication of its novelty. In addition, the challenges of telecommuting (e.g., managing the overlapping routines of work and home and difficulties of accessing the complete set of information and tools required to complete work) were novel to most employees transitioning to this form of work. The disruptiveness of this event can be understood by the magnitude of changes it imposed on the daily lives and routines of people (e.g., social distancing, wearing of masks, quarantines, limitations on travel, and shifting of the locus of work to home) as well as its ambiguities, as the event and associated work arrangements continued to unfold. Finally, the criticality of this event can be quantified by its effects on public health and the global economy (Lin & Meissner, 2020).

What further distinguishes this event from other extraorganizational stressors is that instead of having similar effects on everyone, or only affecting a specific community (e.g., a coastal state

in the aftermath of a hurricane), the COVID-19 pandemic event varied in its severity across communities (e.g., confirmed cases in New York City was 207,000 as compared with 13,000 in Rockland County, NY, as of June 8, 2020). Simultaneously, the responses to the pandemic were also varied across states, with some enforcing social distance and telework more stringently (e.g., New York) and earlier (e.g., Illinois) than others (e.g., Utah). These intercommunity differences provided us the unique opportunity to examine the impact of the variability in the prevalence of COVID-19 across communities across the timeframe of this study on the varying levels of disruption on the SWFB of individual telecommuters embedded within these communities over time. The nature of these disruptions and the associated dynamic changes of well-being can be explicated utilizing the framework of adaptation theory.

Adaptation theory

According to adaptation theory, individuals adapt to both positive and negative stimuli such that after the occurrence of a stimulus, individuals experience initial changes in emotion and cognition but generally return to their own preexisting set point (Brickman & Campbell, 1971; Diener, 1994). The stimulus could be a single event (e.g., the coronavirus outbreak), a recurring event (e.g., the COVID testing), or a change of circumstance (e.g., change of work arrangements). Recent modifications of this theory (Diener et al., 2006; Lyubomirsky, 2011) point to individual differences in set points and highlight the role of individuals' own efforts in hastening adaptation to the circumstances and reducing the length of time needed to revert to a set point after negative stimuli. Such efforts might include introducing novelty and variability in routines, seeking out new experiences to keep relationships fresh, and expanding social networks to encounter interesting people and ideas, among others. Many empirical studies have provided evidence for the adaptation process of well-being after a single life event (e.g., marriage, divorce, and unemployment) across multiple yearly lags (Lucas, 2007). More recently, adaptation theory has been applied and tested in the research on work stressors, strain, and work–family conflict using relatively shorter time lags (e.g., multiple months; Matthews, Wayne, & Ford, 2014; Matthews & Ritter, 2019; Ritter et al., 2016).

We suggest that adaptation theory could also be applied to understand the psychological experiences of a sudden transition to telecommuting. Forced transition to new ways of working (either fully remote or hybrid model) could constitute sources of stress, as new telecommuters may need more time to reconfigure various aspects of work and family (e.g., home arrangements and work schedules). However, as time passes, the benefits of telecommuting are likely to emerge. For instance, a move to telecommuting is an overall positive stimulus that can provide individuals with the opportunity to attain work–life balance, that is, the state of being equally engaged in and satisfied with their work and family roles (Greenhaus et al., 2003). This is because telecommuters are able to save time otherwise spent on traveling to their place of work and schedule various work activities outside the regular “workday” to make room for essential family commitments (e.g., childcare and eldercare) without being conflicted by differing sets of role expectations (Standen et al., 1999). Consistent with this argument, meta-analytic evidence suggests that telecommuting has a small but significant negative influence on work–family conflict (Gajendran & Harrison, 2007). Indeed, research conducted before the pandemic revealed that the potential costs of telecommuting include disengaging from the work role to invest in one's family or the intrusion of the family on work roles (Eddleston & Mulki, 2017; Golden et al., 2006). However, sentiment analyses using Twitter data after the COVID-19

outbreak showed that telecommuters' reactions and experiences of working remotely have in fact been "mildly positive" with respect to its various benefits (e.g., remote learning and increased social connection via technology; Zhang et al., 2021). Thus, a more optimal balance between work and family roles may be achieved and become a "silver lining" to the social distancing measures enacted by various communities during the COVID-19 pandemic. Linking back to event system theory, as the perception of novelty and intensity of the exogenous event potentially decreases, worker well-being is likely to show a trend of recovery. Indeed, there is some preliminary evidence from longitudinal studies suggesting that well-being levels showed a small uptick around the middle of 2020 (see Michel et al., 2021; Min et al., 2021). Based upon the above arguments, we expect to observe increasing trajectories of SWFB and well-being in the current study.

However, we also argue that the strategies utilized by individuals to adapt to telecommuting are likely to be less effective for those living/working in communities with high proportions and increasing incidences of COVID-19, leading to a slower trajectory of increase (i.e., slower adaptation) to the new work arrangement. This is because the lockdowns, closures, and signals of ill-being in the community may restrict efforts such as finding alternative educational or daycare arrangements for children, socializing opportunities for renewal and recuperation, and interacting with friends and colleagues to manage stressors. We provide a more complete rationale for a negative relationship between the increase of COVID-19 cases in the community and the trajectory of SWFB in the next section.

COVID-19 cases and the trajectory of satisfaction with work–family balance

Viewing the pandemic as an event with a dynamic impact on both employees' work and life domains, we suggest that the proportion and trajectories of confirmed COVID-19 cases are direct indicators of pandemic severity within various communities and associate it with the rate of change in SWFB levels. For instance, individuals living in communities with high proportions of confirmed cases (e.g., New York City during early stage of the pandemic) are likely to perceive a higher level of criticality and threat from the event, whereas those living in communities with low proportion of confirmed cases (e.g., Carter County in Montana) may perceive the event as less critical and experience little changes to daily routines. Moreover, during the first several months of the pandemic, communities tended to impose additional constraints related to both work and family domains. First, individuals living in communities with rapidly increasing rates of COVID-19 were likely to encounter increases in "bad news" regarding hospitalization (and possibly deaths), leading them to be increasingly concerned about the well-being of their family (e.g., education of dependents, welfare of parents, financial insecurity, and fear of hospitalization) and friends, resulting in disengagement with work tasks (Matthews, Winkel, & Wayne, 2014). Similarly, concerns related to the conduct and stability of work (e.g., job insecurity and inadequate training and tools to manage changes in work processes) might have negatively impacted on individuals' dedication to family responsibilities. Second, rapid increases in COVID-19 rates in the community led to work and school closures, leading to increases in interruptions during the enactment of one's work roles (Delanoëje et al., 2019), as well as increases in family responsibilities. Relatedly, there is evidence that access to communication technology throughout the day interferes with enacting one's family role and lead to extended workdays, overwork, and interruptions (Demerouti et al., 2014; Fenner & Renn, 2010).

Third, the communities with higher incidence rates of COVID-19 cases might have imposed strict guidelines for social distancing or crowd gathering for an extended period of time, thus limiting opportunities for respite and recovery (e.g., going to a gym or shop). With the rapid increase of COVID-19 cases, these role stress and conflicts as well as the lack of sufficient time for readjustment can be viewed as slowing down the adaptation process for one's satisfaction with work–family balance to revert back to the preexisting level (Grawitch et al., 2013).

In sum, although telecommuting has been shown to be beneficial for mitigating work–family conflict (Gajendran & Harrison, 2007) and telecommuters, in general, may adapt to experience an upward trajectory of SWFB, the challenges and concerns related to the severity of COVID-19 may negatively influence both overall levels of and the rate of increase of SWFB. Further, using the proportion of COVID-19 cases as the operationalization of COVID-19 severity, the rate of increase in COVID-19 cases may also have an impact on slowing down the upward trajectory of SWFB, as workers continue to adapt to various stressors and conflicts in both work and family domains. Thus, we hypothesize the following:

Hypothesis 1a. The initial level of proportion of confirmed COVID-19 cases in telecommuters' communities will be negatively associated with the initial levels of SWFB.

Hypothesis 1b. The rate of increase in the proportion of confirmed COVID-19 cases in telecommuters' communities will be negatively associated with the rate of increase in levels of SWFB.

Relationships between increases in SWFB and well-being levels

Psychological well-being can be viewed as consisting of a set point dictated by individuals' traits and life experiences, as well as the variance or fluctuations in their experiences due to positive or negative life or work situations (Cummins et al., 2002). Meta-analytic evidence suggests that when considered over short time spans—weeks or months—changes in average well-being are typical but stability is atypical, whereas the reverse is true for longer time spans such as years or decades (Mäkikangas et al., 2016). One important factor influencing well-being over time is work–family balance. Greenhaus et al. (2003) provide three reasons for why SWFB is associated with well-being. These include the buffering effect of one role on the other (satisfaction with family could mitigate negative experiences at work), an increase in the worker's capability to handle various work demands and experience lower levels of stress, and a decrease in work–family conflict. Because SWFB captures one's perception regarding the interaction between different life domains, satisfaction with work–family interaction can be viewed as conducive to one's psychological well-being. Indeed, recent meta-analytic evidence suggests that SWFB is positively associated with life satisfaction (Casper et al., 2018) and specific domain (work and nonwork) satisfaction (Grawitch et al., 2013); and work–family conflict is negatively associated with life satisfaction (Amstad et al., 2011). Similarly, workers who are unable to meet the conflicting demands of their work and family roles experience significant levels of emotional exhaustion (Amstad et al., 2011; van Rijswijk et al., 2004).

There is evidence suggesting that work–family variables related to SWFB might have time lagged effects on well-being. For instance, Grant-Vallone and Donaldson (2001) found that workers' self-reports of work–family conflict (a driver of SWFB) predicted self- and coworker

reports of well-being after a 6-month period. Utilizing a three-wave cross-lagged panel study, Demerouti et al. (2004) discovered a negative effect of work-home interference on emotional exhaustion after 6- and 12-week periods. However, studies linking changes in SWFB and changes in well-being are exceedingly rare. We propose that as SWFB increases, workers will experience a decrease in emotional exhaustion and an increase in life satisfaction.

Hypothesis 2. The rate of increase in SWFB will be positively associated with the rate of increase in psychological well-being indicated by a decrease in emotional exhaustion and an increase in life satisfaction levels over time.

Following the event system theory and adaptation perspectives, a critical, novel, and disruptive external event may require one to invest more time and attention in order to maintain one's well-being. During the COVID-19 pandemic, although individuals are adjusting to new work arrangements and family routines, the increasing severity of the pandemic continues to pose additional challenges and stressors that may dwindle the increasing trajectory of SWFB. The prolonged exposure to an event may also result in poor well-being to linger longer, which could manifest as thwarting the acceleration of one's psychological well-being. Taken together, we propose that the rate of increase in proportions of COVID-19 cases in the community will have indirect effects on the increasing trajectory of well-being via the rate of increase in SWFB.

Hypothesis 3a. Initial levels of SWFB will mediate the relationship between the initial level of proportion of confirmed COVID-19 cases in telecommuters' communities and initial levels of well-being.

Hypothesis 3b. Increase in SWFB will mediate the relationship between the rate of increase in proportions of confirmed COVID-19 cases in telecommuters' communities and the rate of increase in well-being (decrease in emotional exhaustion and increase in life satisfaction).

METHOD

Procedure and participants

We utilized a combination of objective COVID-19 incidence data and survey responses from participant-panels to test the hypothesized relationships. Confirmed cases of COVID-19 at the county level were obtained from Johns Hopkins University's Coronavirus Resource Center and survey data were collected using a participants-panel managed by Qualtrics, a third-party research company that provides researchers with targeted samples to collect data (see Allen et al., 2016; Rudolph & Baltes, 2017). Research has suggested that online panels are representative of the working population and that the data obtained are as reliable and valid as data obtained through traditional organizational samples (Porter et al., 2019; Walter et al., 2019). Qualified participants, who were full-time employees and transitioned to remote work due to COVID-19, were invited to complete the Time 1 survey consisting demographic questions and measures of study variables. One week after the completion of this survey, they were contacted to complete the Time 2 survey; and a week after this, they received the final Time 3 survey. Participants recruited from the Qualtrics panel were recruited from a variety of sources and thus

were compensated differently (e.g., obtaining points for SkyMiles, gift cards). We began collecting data for this study with the first wave on April 17, 2020, and ended the third and last wave of data collection on May 11, 2020. It should be noted that during this time period, the number of confirmed COVID-19 cases in the United States nearly doubled (increased from 690,714 to 1,342,594).

Due to about 50% attrition rates between two timepoints in longitudinal study using online panels, we recruited 1377 full-time US workers who have been telecommuting at the time of recruitment due to COVID-19 to participated in the Time 1 survey, 700 of them completed the Time 2 survey, and finally 349 responded to Time 3 survey. After listwise deletion, the final sample consisted of $N = 349$ participants who completed all three surveys. We looked for systematic patterns in their attrition by regressing the retained versus dropout sample onto age, gender, organizational tenure, and three measured variables in our study utilizing logistic regression. Age (odds ratio = 1.017, $p = .007$) and relatedly organizational tenure (odds ratio = 1.015, $p = .032$) were the only two variables that had significant effects, suggesting that older participants were more likely to remain in the study throughout three waves.

The final sample was 67% male, and participants were on average 49.9 years old ($SD = 11.45$). This sample was predominantly White (87.4%), 8.3% Asian, 2.6% Black, and 0.6% Native Americans, and 1.1% reported other races. A majority of our participants were married (68.8%); most of them reported living with at least one other person (80.2%). In comparison, majority of full-time workers in the United States are male (57.2%), White (77.2%), fall in the age bracket of 25–54 years, and married (77%; Bureau of Labor Statistics, 2020). Thus, our sample has moderately more male and more White than the general US population. The average hours of telecommuting per week during April to May 2019 (as self-reported by participants) was 15.96 ($SD = 20.53$) hours, whereas the average hours telecommuted each week reported for the current time period was 31.93 ($SD = 15.72$), demonstrating that our participants were all new in transitioning to telecommuting. In addition, majority of our participants lived with at least one other person (80.2%), and a little less than half of them had at least one dependent (40.4%), which suggested that most of them might have to coordinate with others in the household for remote working. These participants worked in a wide range of industries (e.g., service, federal or state government, manufacturing, and nonprofit organizations). The majority (95%) of participants in our sample reported that an order of “shelter-in-place” or “stay-at-home” was issued in their respective zip-code areas at all three timepoints. Forty-five states (with the largest responses from NY [10%] and CA [10.6%]) and 332 zip-code areas were represented in our final sample.

Measures

Proportions of confirmed COVID-19 cases in communities

We mapped a dataset of confirmed cases by county data obtained from Johns Hopkins University's Coronavirus Resource Center to the zip codes of the county extracted from participants' location coordinates. Specifically, we obtained confirmed cases from the week that corresponded to each timepoint of our surveys. Then, we computed the proportion of confirmed COVID-19 cases in each community (i.e., zip code) by dividing the total confirmed cases (as of the beginning of data collection process, April 15, 2020) by total population of the corresponding zip code. Although participants were nested in zip-code areas, about 95% resided

in different zip-code areas, which suggested that there was no variance of proportions of confirmed COVID-19 cases within zip codes. We validated this observation by statistically decomposing the variance and finding no within-zip-code variance. Given that we obtained three COVID-19 cases measurement across the duration of the timeframe of this study, we treated COVID-19 cases in the zip code as a within-person level variable (same as all other variables included in the model).

Satisfaction with work–family balance

SWFB was measured using Valcour's (2007) satisfaction with work–family balance scale. Participants were asked to indicate, on a scale from 1 (*very dissatisfied*) to 5 (*very satisfied*), the extent to which they were satisfied with balancing between work and family domains. An example item was “how satisfied were you with the way you divide your time between work and personal or family life.” This scale also demonstrated high internal consistency over three timepoints ($\alpha = .93-.94$).

Emotional exhaustion

Emotional exhaustion was measured using a three-item scale adapted from the Maslach Burnout Inventory General Survey (Schaufeli et al., 1996), which has been used in previous studies (e.g., Demerouti et al., 2012). The participants were asked to indicate the extent to which they felt exhausted over the past week on a scale from 1 (*not true*) to 5 (*always true*). An example item was “I felt emotionally drained.” This measure demonstrated good internal consistency ($\alpha = .89-.91$).

Life satisfaction

Life satisfaction was measured using the Satisfaction with Life Scale developed by Diener et al. (1985). Participants were asked to rate five items that asked the extent to which statements described how they felt during the past week (e.g., “I am satisfied with my life”) on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). This scale demonstrated high internal consistency ($\alpha = .92-.94$).

RESULTS

Descriptive statistics, internal consistency estimates, and correlations between the variables in the study are presented in Table 1. The overall pattern of intercorrelations suggest that respondents in communities with higher proportion of COVID-19 cases experienced significantly higher levels of exhaustion ($r = .12$ at Time 3; $p = .022$); as well as lower levels of SWFB ($r = -.14$ at Time 3; $p = .010$) and life satisfaction ($r = -.15$ at Time 3; both $p = .005$), than those in communities with lower proportions of cases.

We calculated the intraclass correlations (ICC1) for all the time-variant variables to ascertain whether the changes in scores over time vary across respondents. The ICC values SWFB

TABLE 1 Descriptive statistics and correlations between variables in the study ($N = 349$)

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Gender (M/F)	1.33	.47	-															
2. Age	49.85	11.45	-.13	-														
3. Tenure	13.55	10.60	-.16	.46	-													
4. COVID-19 cases_T1 ^a	.02	.03	.14	-.07	-.03	-												
5. COVID-19 cases_T2 ^a	.03	.04	.14	-.07	-.03	.99	-											
6. COVID-19 Cases_T3 ^a	.03	.04	.15	-.08	-.04	.99	.99	-										
7. Time lapse	18.53	10.92	-.03	-.10	-.13	-.45	-.45	-.46	-									
8. SWFB T1	4.06	0.77	-.03	.10	.03	.02	.01	.02	-.13	.94								
9. SWFB T2	4.06	0.78	.07	.01	-.03	-.06	-.06	-.06	-.09	.59	.93							
10. SWFB T3	4.10	0.74	.02	.17	.05	-.13	-.13	-.14	-.03	.60	.68	.94						
11. EXH T1	2.03	0.86	.14	-.27	-.18	.05	.05	.04	.08	-.37	-.20	-.26	.89					
12. EXH T2	2.06	0.94	.06	-.22	-.17	.06	.06	.06	.05	-.32	-.30	-.35	.75	.91				
13. EXH T3	1.99	0.89	.16	-.24	-.22	.13	.13	.12	.01	-.31	-.28	-.38	.75	.77	.90			
14. LSAT T1	4.87	1.29	-.11	-.01	.09	-.10	-.10	-.10	-.02	.37	.31	.32	-.34	-.33	-.34	.92		
15. LSAT T2	4.88	1.39	-.09	.00	.06	-.19	-.20	-.20	.04	.30	.42	.34	-.30	-.37	-.36	.80	.94	
16. LSAT T3	5.00	1.30	-.11	.05	.10	-.14	-.15	-.15	.04	.33	.38	.42	-.33	-.36	-.40	.81	.84	.93

Notes: Correlations $|r| \geq .11$ are significant with $p < .05$; correlations $|r| \geq .14$ are significant with $p < .01$. Cronbach alphas are in bold. Abbreviations: EXH, emotional exhaustion; LSAT, life satisfaction; SWFB, satisfaction with work-family balance; Time Lapse, time lapse since the “stay-at-home” order. ^aProportion of COVID-19 confirmed cases in communities.

(ICC1 = .62), exhaustion (ICC1 = .75), and life satisfaction (ICC1 = .81) were all found to be high and provided justification for examining the growth factor of these variables (Halbesleben et al., 2013). Next, we established that each time-variant variable had a significant slope or growth factor by estimating latent growth curve models for the proportion of COVID-19 cases in one's community (slope mean [variance] = .01 [.00]; $p < .001$), SWFB (slope mean [variance] = .06 [.03]; $p = .05$), exhaustion (slope mean [variance] = $-.06$ [.03]; $p = .03$), and life satisfaction (slope mean [variance] = .10 [.04]; $p = .001$). We also tested for nonlinearity in the growth curves (by adding quadratic functions) but did not find any evidence for this in any of the variables. Given these affirmative findings, we proceeded with our hypothesis testing.

All three hypotheses were tested using the lavaan package (Version 0.6-5; Rosseel, 2012) in the free statistical software R (version 3.6.3; R Core Team, 2013). Model fit was evaluated using six indicators: the chi-square goodness of fit test, comparative fit index (CFI), Tucker Lewis index (TLI; also known as the nonnormed fit index), root mean square error of approximation (RMSEA), and standardized root mean squared residual (SRMR; Hu & Bentler, 1999). See Table 2 for model fit indices from all models included in our analyses.

In Model 1, we tested the direct, that is, unmediated effects of both the intercept and slope of proportion of COVID-19 cases on the intercepts and slopes of exhaustion and life satisfaction correspondingly. This model exhibited poor fit with the data ($\chi^2[51] = 239.44$; $p < .001$; CFI = .97; TLI = .96; RMSEA = .11; SRMR = .16). Model 2 examined the proposition that relationships between proportion of COVID-19 cases and exhaustion and life satisfaction were both, were direct, and mediated by SWFB, which showed good fit with the data ($\chi^2[45] = 106.263$; $p < .001$; CFI = .99; TLI = .99; RMSEA = .06; SRMR = .05). In Model 3, we tested the fully mediated relationships between proportion of COVID-19 cases and the outcomes. This model ($\chi^2[49] = 113.92$; $p .001$; CFI = .99; TLI = .99; RMSEA = .06; SRMR = .06) also fit the data well and was found to be as good a fit to the data as the partially mediated model ($\Delta\chi^2[4] = 7.66$; $p = .105$). A closer examination at the parameter estimates revealed that the direct effects of both intercept and slope of COVID-19 cases on intercept and slope of outcome variables were not significant in Model 2. Thus, Model 3, the fully mediated model was retained, and parameter estimates from this model were reported (see Figure 1).

Hypothesis 1 proposed associations between the proportion of COVID-19 cases and SWFB in terms of both intercepts and slopes. We found that the intercept of COVID-19 cases was not significantly related to the intercept of SWFB (Coeff [SE] = $-.12$ [.79]; $p = .880$). However, the slope of COVID-19 cases was negatively associated with the slope of SWFB (Coeff [SE] = -2.70 [1.07]; $p = .012$). Thus, Hypothesis 1a regarding the initial levels was not supported, but Hypothesis 1b predicting that a higher rate of increase in COVID-19 cases would negatively influence or slow down the rate of increase in SWFB was supported.

Hypothesis 2 predicted relationships between change in SWFB and changes in exhaustion and life satisfaction. Consistent with this hypothesis, rate of increase in SWFB was negatively

TABLE 2 Model fit indices

Model	χ^2 (df)	CFI	TLI	RMSEA	SRMR
<i>Proportion of COVID-19 cases as predictor</i>					
M1: Direct effects model	239.437 (51)	0.967	0.957	0.106	0.156
M2: Partial mediation model	106.263 (45)	0.990	0.985	0.062	0.049
M3: Full mediation model	113.918 (49)	0.989	0.985	0.062	0.059

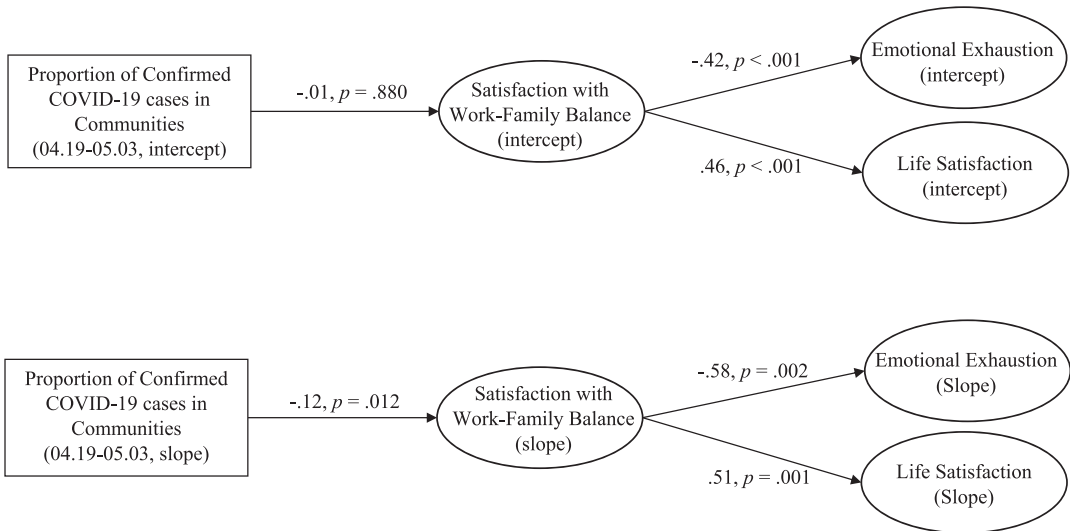


FIGURE 1 Dynamic mediation growth curve model. *Note:* Standardized parameter estimates are presented

related to rate of decrease in exhaustion (Coeff [SE] = $-.59$ [.19]; $p = .002$) and positively related to rate of increase in life satisfaction (Coeff [SE] = $.86$ [.26]; $p = .001$). We then tested the mediation relationship stated in Hypothesis 3. We used the Monte Carlo method of resampling to construct bias-corrected 95% confidence interval for each indirect effect, and a confidence interval that does not contain 0 demonstrates a significant indirect effect (Selig & Preacher, 2008). Results revealed that both the indirect effects of rate of increase in the proportion of COVID-19 cases on the rate of increase in emotional exhaustion ($ab = 1.55$; 95% C.I. [.29, 3.21]) and rate of increase in life satisfaction ($ab = -2.28$; 95% C.I. [-4.62, -.47]) via rate of increase in SWFB were statistically significant. This provides evidence to support Hypothesis 3b; however, Hypothesis 3a was not supported due to the nonsignificance of the path between initial level of proportion of COVID-19 cases and initial level of SWFB. Finally, our model also presented the relationships between the intercept of SWFB and intercepts of well-being outcomes. Specifically, we found that SWFB was negatively associated with emotional exhaustion (Coeff [SE] = $-.57$ [.08]; $p < .001$) but positively associated with life satisfaction (Coeff [SE] = $.95$ [.12]; $p < .001$). With the nonsignificant relationship between the intercept of COVID-19 cases and the intercept of SWFB, we did not compute indirect effects of the overall level of COVID-19 cases on well-being outcomes via overall levels of SWFB. In sum, we found evidence for the predicted relationships between the slopes of the proportion of COVID-19 cases, SWFB, and well-being (emotional exhaustion and life satisfaction). Further, we found evidence that the slope of SWFB significantly mediated the relationship between the slope of COVID-19 cases and slopes of well-being outcomes.

Supplementary analyses

Given that the disruption to the adaptation process could not only come from the severity of COVID-19 and also the restriction due to the “stay-at-home” order, we conducted additional analysis to rule out the alternative explanation that the rate of change of SWFB and well-being

may in part be driven by the extent of “stay-at-home” order.¹ We obtained data on the timing of the “stay-at-home” orders at the county level from the Centers of Disease Control and Prevention’s National Environmental Public Health Tracking Network (<https://ephtracking.cdc.gov/DataExplorer/>) and mapped with our dataset via the zip codes of the county extracted from participants’ location coordinates. Then, we coded the time lapse between the start day of the order in respondents’ counties and the day when they completed the Time 1 survey, including this time lapse variable as a control variable in the full-mediation model. We found that the model showed acceptable fit ($\chi^2[55] = 195.32$, $p < .001$; CFI = .98; TLI = .97; RMSEA = .09; SRMR = .09); though comparing the fit indices, Model 3 showed a relatively better fit to the data. In addition, the significance of parameter estimates for each path remained the same as in Model 3 (see Supporting Information for detailed results).²

DISCUSSION

We conducted a longitudinal study to examine the influence of a disruptive environmental event—the COVID-19 pandemic on changes in SWFB and well-being of telecommuters in the United States. Our results suggest that COVID-19 severity within telecommuters’ residential communities hampered the increasing trajectory of telecommuters’ SWFB, thereby influencing the rate of decrease in emotional exhaustion and rate of increase in life satisfaction. Our findings point at not only the influence of changing environmental stressors on well-being over time (Biggs et al., 2014; Byron & Peterson, 2002; Hochwarter et al., 2008), but one of the *mechanisms* through which these stressors influence important well-being outcomes. Though this study was conducted during an unusual time when our work and lives are largely impacted, our findings have important theoretical implications.

Theoretical implications

First, extant work–family research has tended to focus upon the dynamics of individual experiences and behaviors within and across domains as well as the interactions with other members within a domain (e.g., Ashforth et al., 2000; Day, 1995); however, this study considers the contextual influence of large-scale disruptive and continuously changing environmental events on more proximal and tangible changes in work and family experiences and well-being. From the adaptation perspective, we understand that employee well-being reverts to a pre-event set point as people adapt to stressors (Diener et al., 2006; Ritter et al., 2016); our study demonstrates that change in the severity of an external event may negatively influence the adaptation process. Specifically, we found that the extent to which the disruptive event is pervasive and continuously increasing in the telecommuter’s residential community has an influence on within-person variables including SWFB and well-being. The increase in SWFB over time appeared to be slower in communities with accelerating confirmed cases of COVID-19, perhaps due to the constant and repeated exposure to additional stressors as the pandemic continues to disrupt telecommuters’ work lives and daily routines, thus requiring more time for sensemaking and adjustment to the new work and living environments. Corroborating with the notion of additional stressors attenuating the adaptation process (Lyubomirsky, 2011), we found that individuals who lived in communities with an earlier start of the “stay-at-home” order (i.e., more time for adjustments) experienced more pronounced increase in satisfaction with work–family

balance. While previous empirical research on adaptation primarily focused on physical and psychological well-being and work-related stressors as antecedents (e.g., Keller et al., 2020), our study further investigated work–nonwork interface over time (e.g., Casper et al., 2007) and examined extraorganizational factors as an antecedent, which contributed to the understanding of adaptation process among working adults under a time with uncertainties and sudden changes.

Second, departing from other studies of extraorganizational stressors that provide snapshots of individual experiences before and/or after the event, we demonstrate the impact of differing rate of change in the pandemic on the changes in psychological experiences and well-being. These findings corroborated with the top-down direct effects of an environmental event on *within-individual changes* of psychological experiences (Morgeson et al., 2015). With fluctuating events such as COVID-19 where severity and indeed community-level responses rapidly change over time, we demonstrate the importance of capturing workers' experiences over a shorter timeframe. Going beyond taking the context into account (e.g., as a control), this study explicitly and quantitatively modeled “context as an event” (Johns, 2006), that is, capturing COVID-19 pandemic not just as a single event, but the acceleration in its severity, thereby filling a much-needed niche in literature.

In addition, the use of a sample of newly transitioned telecommuters offers insights for organizations on designing new practices in the “new normal” work arrangements, especially during a critical time of facing an uncertain future of how the COVID-19 pandemic might unfold (e.g., the increasing COVID-19 cases due to the outbreak of new variants of the coronavirus). As workers continue to telecommute, our findings can help inform organizational policies and practices related to the effective management of work–family roles. Some of these suggestions are provided below.

Practical implications

A key finding of this study was the mediating effect of SWFB on the relationship between COVID-19 cases and telecommuter well-being. There are several implications of this finding for human resource management practice. First, although telecommuting is likely to remain a key means of fostering flexible work and employee engagement, it is important for organizations to supplement this practice with employee training. Findings on telecommuting benefits from pre-pandemic were based on samples of employees who voluntarily choose to work remotely; relatedly, individuals who choose not to telework still exhibited high work–life balance (Koh et al., 2013). However, our study suggests that telecommuters possibly struggled with balancing work and home priorities especially during times of disruption (sudden switch to telecommuting). Thus, the environment event, coupled with the “enforced telecommuting” arrangements, negatively influenced their ability and opportunities to adapt. To that end, organizations should consider adopting various strategies to ease such transitions, including training on how to design and manage physical workspaces that are demarcated from the rest of the home (Allen et al., 2021), schedule uninterrupted time for work and family tasks, and draw temporal (i.e., start and end times) and technological (i.e., disconnected from work emails) boundaries around work to avoid spillover and overwork.

Second, this study showed that the changes of an exogenous event, indicated by the growing pattern of the COVID-19 cases, could slow down the process of adaptation. As pandemic severity ebbs and flows, individuals may experience new threats and challenges that disrupt the ways

how one manages various role demands. In addition, several large employers are moving toward a more flexible conception of work and adopting remote-work policies (Business Insider, 2020), suggesting that a larger proportion of workers will continue telecommuting and possibly facing issues with managing role boundaries. Thus, organizations could conduct frequent check-ins with employees or provide resources and opportunities for employees requiring health-related and social support to enhance well-being.

Limitations and future research

This study also has a few limitations. First, beyond the objective data gathered on COVID-19 cases in the community, our data were survey and self-report based. Future studies could utilize supervisor or customer ratings of performance and coworker reports of citizenship behaviors to expand our understanding of various outcomes of SWFB beyond well-being. Second, we utilized a relatively short timeframe (1 week between each wave) for data collection anticipating a decline in COVID-19 (i.e., curve flattening) in the United States. However, the continuation of the pandemic with new variants (e.g., Delta and Omicron) points at the importance of using a longer timeframe to capture further changes as organizations announce new flexible work arrangements policies and families negotiate their boundaries and arrive at some form of resolution to the competing work and home demands. Third, a related limitation of this study was that we captured SWFB levels a few weeks after the beginning of stay-at-home orders that might have led to a loss of valuable data regarding employees' immediate response to the transition. Future studies might be needed to capture worker experiences immediately after the onset of such disruptive events. Fourth, we did not capture within-community variation in SWFB and well-being. Future studies might focus on the differences in the experiences of multiple workers nested within the same zip code in order to investigate the role of differing perceptions of threat on well-being outcomes. Lastly, our sample suffered from large attrition across the three timepoints and resulted in the retention of a relatively older sample. Older adults may experience more challenges with remote working, resulting in a prolonged adjustment time (Clark et al., 2012). Future research should utilize a variety of sampling methods to recruit a more representative sample and reduce attrition rate in longitudinal studies so that the results may be more generalizable to the broader working population.

In conclusion, although the COVID-19 pandemic can be considered a significant public health threat, societies and organizations are likely to continue facing similar disruptive events. Our study provides critical insights on how workers respond and adapt to disruptions and how they in conjunction with their organizations can foster the well-being of themselves and others.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interests.

ETHICS STATEMENT

The authors obtained ethics approval (Protocol # HS20-0383) from the Institutional Review Board at Northern Illinois University prior to collecting data presented in this study.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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ENDNOTES

¹ We thank an anonymous reviewer for this helpful suggestion.

² We also explored whether the lapse of days since the order in one's county might have an impact on the trajectories of SWFB and well-being outcomes. We found that individuals living in communities with earlier start of the "stay-at-home" order experience a significant upward trajectory in their satisfaction with work–family balance (see Supporting Information for detailed results).

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