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Telecommuting during the coronavirus pandemic: Future time orientation as a mediator between proactive coping and perceived work productivity in two cultural samples

Yuhsuan Chang^{*}, Chungjen Chien, Li-Fang Shen

Yuan Ze University, Taiwan

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ABSTRACT

This study examines the relationship between proactive coping, future time orientation, and perceived work productivity during the coronavirus (COVID-19) pandemic, based on the work-from-home experience of employees in Taiwan and the United States (U.S.). It draws on the conservation of resources (COR) theory, which posits that proactive coping and future time orientation are crucial personal resources that affect the capacity of an individual to adapt to stressful situations. The results show that in the relationship between proactive coping and perceived work productivity, future time orientation acts as a full mediator in Taiwan and a partial mediator in the U.S. The study extends the application of the COR theory to the context of the COVID-19 pandemic and offers important insights that will enable professionals to assess the role of proactive coping and future time orientation in their productivity evaluations of working tasks and to design appropriate training sessions.

1. Background of study

As of the beginning of 2020, the COVID-19 pandemic has resulted in unexpected changes to the lives of people across the globe (World Health Organization, 2020). With no effective treatments or vaccines available yet for this novel disease, governments and companies have ordered workers to work from home in order to remain safe. Salari et al. (2020) report that the prevalence of stress in the general population has reached 29.6% as a direct result of the pandemic. The duration of the pandemic is difficult to predict, and people face many uncertainties in their daily lives as well as multiple challenges in the workplace. The pandemic poses a threat to both mental and physical health, and individuals across the globe have sought out proactive responses in an attempt to minimize the potential damage (Chater, 2020).

One such response is the adjustment to modified work arrangements, such as telecommuting. In the past two decades, telecommuting usually refers to remote work arrangement that enables employees to perform job tasks at home on a voluntary basis (e.g., Apgar, 1998). However, they have now been forced to do so at short notice because of the COVID-19 pandemic. A survey conducted by the Organization for Economic Cooperation and Development (OECD, 2020) reported that knowledge-intensive industries (e.g., technology) were more likely to adapt to

telecommuting, compared to industries that require the physical presence of their workers to perform their tasks. Traditionally, telecommuting is not perceived as creating a stressful situation, and various factors (e.g., incentives or work tasks) are known to contribute to positive work productivity at home (Gajendran & Harris, 2017). However, Morikawa (2020) finds that telework may be associated with decreased self-reported productivity by employees during the COVID-19 pandemic. Compared with telecommuting in earlier years, a variety of advanced digital technology (e.g., business app with full functions of completing job tasks) tools is widely available for teleworkers. The OECD (2020) also reports that limited access to child-care support, social isolation, and family-work boundary violations have all caused teleworkers to suffer work productivity difficulties at both the individual and organizational levels during this global crisis.

As a result, employees have had to be largely self-reliant in their efforts to overcome challenges and maintain a desirable level of work productivity. For example, teleworkers are learning new ways to connect with colleagues and clients for effective communication and must manage potential distractions at home in order to remain focused on their work (OECD, 2020). This implies that differences in workers' personal approaches to managing unexpected changes and coping with uncertainty may result in different productivity outcomes. Thus, the aim

^{*} Corresponding author at: College of Management, Yuan Ze University, 135 Yuan-Tung Road, Chungli Dist., Taoyuan city, Taiwan.
E-mail address: yuyuchang@saturn.yzu.edu.tw (Y. Chang).

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of this study is to examine how an individual's personal resources contribute to work productivity during this unique crisis period.

1.1. Conservation of resources theory and hypothesis development

The application of the conservation of resources (COR) theory (Hobfoll, 1989) would provide us with a useful framework for understanding the importance of resources to an individual in the context of the COVID-19 pandemic. The COR theory posits that people with sufficient resources are less vulnerable to stressors. Of the different types of resources identified within the COR theory, personal resources are perhaps the most relevant in the context of this pandemic, considering the limitation of access to other resources imposed by national regulations regarding social distancing and quarantining (CDC, 2020). Moreover, because of the difficulty in controlling the unexpected spread of the COVID-19 virus, companies and governments have had to change work policies frequently. Hence, personal resources for coping with the challenges and distress caused by the pandemic may have a significant effect on the ability of workers to remain productive at work.

Previous studies have mostly examined personal resources (e.g., self-esteem) in job-related situations such as burnout (e.g., Toker & Biron, 2012), an approach which is less applicable in the COVID-19 context. In this study, we focus on proactive coping and future time orientation because these two factors are highly relevant resources for individuals facing uncertain and stressful situations. For example, in the case of the 2009 H1N1 pandemic, Taha, Matheson, Cronin, and Anisman (2014) found that the manner in which an individual copes with stress significantly affects the adjustment outcomes. Moreover, Bolotova and Hachaturova (2013) suggest that time orientation is a crucial resource in an individual's mental organization that is linked to the capacity to cope under stress. Thus, we shall discuss these two personal resources within the framework of the COR theory.

1.2. Proactive coping

Alongside a number of different coping mechanisms, proactive coping is defined as an effort to create resources that are beneficial to manage stressors and future challenges in a way that facilitates personal growth (Aspinwall & Taylor, 1997). Unlike problem-focused or emotion-focused coping, which seek to resolve stressful situations or to reduce an individual's negative emotions toward stressors (Lazarus & Folkman, 1984), proactive coping reflects a growth-oriented mentality when dealing with the potential challenges of ambiguous and stressful situations, which fits better in the context of COVID-19. Research has shown that proactive coping is linked to positive work outcomes and that proactive employees are more likely to report higher work performance, compared with reactive employees (DuBrin, 2013; Ersen & Bilgiç, 2018). For example, Reuter and Schwarzer (2015) find that employees who adopt a proactive coping approach are better able to prioritize job assignments, delegate tasks, manage deadlines, and seek managerial support, each of which is an important job competency skills, and together lead to higher job performance. In the COR theory, proactive coping can be viewed as an individual's personal resource that promotes effective adaptation, such as maintaining work productivity during challenging times. Since individuals with higher proactive coping abilities are considered to possess more work-related skills and are able to adjust better to changes, we hypothesize that they have higher work productivity despite the challenges posed by the COVID-19 pandemic (Hypothesis 1).

1.3. Proactive coping and future time perspective

Future time orientation reflects a person's desire to achieve goals and to use time effectively to prepare for future encounters, which itself induces the accumulation of resources (Aspinwall & Taylor, 1997; Zimbardo & Boyd, 1999). When people face uncertainty, their

conceptualization of time may determine their reactions. For example, Nuttin and Lens (1985) conclude that time orientation forms a mental foundation for cognitive functioning that activates a person's subsequent actions or plans. In the context of the COVID-19 pandemic, which has made many aspects of the future uncertain, people understandably may tend to focus on present difficulties and spend time engaging in non-work-related activities due to various distractions. However, the positive effort associated with proactively approaching distress will itself create additional new resources according to the COR theory (Hobfoll, 2002). That is, with proactive coping, an individual's time orientation is directed toward the evaluation of behaviors for their future implications. Accordingly, this study hypothesizes proactive coping to be positively associated with future time orientation (Hypothesis 2).

1.4. Future time orientation and perceived work productivity

Of the different types of time orientations, future time orientation has been the most widely examined in career research and theories (Walker & Tracey, 2012). It has also been associated with positive work and learning outcomes (DuBrin, 2013). Simons, Vansteenkiste, Lens, and Lacante (2004) demonstrate that people with a future time orientation tend to be better equipped to delay gratification because they envision the future consequences of current behaviors. From the COR theory, one's future time orientation (i.e., personal resources) results in higher performance (i.e., positive adaptation to stressors) through the implementation of tasks that are associated with positive future outcomes. Thus, we hypothesize that future time orientation will be positively associated with higher work productivity (Hypothesis 3), and will serve as a mediator between proactive coping and perceived work productivity (Hypothesis 4).

1.5. Study purpose

This study investigates the relationship between proactive coping, future time orientation, and perceived work productivity, based on the work-from-home experiences of two samples of employees during the COVID-19 pandemic. Higher levels of proactive coping are hypothesized as being associated with higher levels of future time orientation as well as perceived work productivity. The mediating effect of future time orientation between proactive coping and work productivity is examined using bootstrapping methods. Since the study evaluates the application of the COR theory in the COVID-19 context, we collected data from both Eastern and Western country samples to account for cultural differences that may affect the examined variables.

Hofstede (2010) reports that the individualism–collectivism spectrum exerts a significant influence on individuals' social behavior, while Jennings (2020) finds that cultural differences may contribute to the different ways in which people cope with COVID-19. For example, in a collectivistic culture, people may be more willing to comply with governmental policy in consideration of the well-being of others. According to Wang, Ng, and Brook (2020), Taiwan is a prime example of a society in which individuals largely comply with governmental regulations and place societal safety ahead of their personal needs; thus, Taiwan represents the collectivistic culture sample in this study. In contrast, the U.S. is characterized by an individualistic culture, according to the reporting score (i.e., 91 out of 100) on the individualistic scale in Hofstede's study (Hofstede, 2010).

2. Method

2.1. Participants and procedures

We collected two samples to examine our hypotheses. All participants were recruited to complete an online survey through digital platforms (e.g., Facebook, Line, and Amazon M-Turk). The survey

questions were designed to obtain information about the employees' work-from-home experiences, proactive coping, and future time orientation during the COVID-19 pandemic. The data was collected from May to June 2020 for the Taiwanese sample and from June to July 2020 for the U.S. sample. In Taiwan, social distancing and other restrictions were implemented in January 2020, and daily increases in infections were low at the time of the data collection. In the U.S., the trend in COVID-19 cases varied across states, with the number of infections increasing during the data collection period. Before completing the survey, all participants were informed that their responses were anonymous, and confidentiality was assured. The demographic information for both samples is reported in Table 1.

2.2. Measurements

Personal resources are measured in the form of proactive coping and future time orientation. It is worth noting that a Mandarin language version of the survey was used for the Taiwanese respondents. To ensure measurement equivalence, we performed the conventional procedure of translation and reverse back-translation (Brislin, 1986) and confirmatory factor analysis (CFA) for construct validity.

2.2.1. Proactive coping

We used Greenglass, Schwarzer, Jakubiec, Fiksenbaum, and Taubert's (1999) proactive coping inventory (PCI) to measure proactive coping. Wu, Chen, and Yao (2008) conducted a cultural validation of the

Table 1
Demographic Information for Both Samples.

Demographic variables	Taiwanese sample (n = 371)	The US sample (n = 407)
	n (%)	n (%)
Gender		
Male	124(33.4%)	232(57.0%)
Female	247(66.6%)	173(42.5%)
Others	0(0.0%)	2(0.5%)
Age		
20–29 years-old	134(36.1%)	92(22.6%)
30–39 years-old	132(35.6%)	151(37.1%)
40–49 years-old	82(22.1%)	100(24.6%)
50–59 years-old	23(6.2%)	45(11.1%)
Others	0(0.0%)	19(4.6%)
Education level		
High school	45(12.2%)	57(14.0%)
Bachelor's degree	221(59.6%)	238(58.5%)
Professional school	43(11.6%)	93(22.9%)
Graduate degree and above	54(14.5%)	13(3.2%)
Missing	8(2.1%)	6(1.4%)
Work tenure		
Under 1 year	61(16.4%)	5(1.2%)
1–3 years	76(20.5%)	39(9.6%)
3–5 years	44(11.9%)	75(18.4%)
5–10 years	61(16.4%)	95(23.3%)
10–15 years	59(15.9%)	63(15.5%)
15–20 years	29(7.8%)	48(11.8%)
Over 20 years	41(11.1%)	81(19.9%)
Missing	0(0.0%)	1(0.3%)
Industry		
IT	63(17.0%)	95(23.3%)
Retailing	61(16.4%)	27(6.6%)
Hotels/Restaurant	20(5.4%)	12(2.9%)
Publication	25(6.7%)	18(4.4%)
Finance/Insurance	37(10.0%)	47(11.5%)
Real estate	11(3.0%)	7(1.7%)
Education	22(5.9%)	29(7.1%)
Health-Care	28(7.5%)	15(3.7%)
Art/Entertainment	32(8.6%)	14(3.4%)
Others	72(19.5%)	143(35.4%)

PCI in the Chinese population and reported a factor structure similar to that of Greenglass et al. (1999). Examples of response statements indicate proactive coping include: "I am a take charge person," and "I always find a way to work around obstacles; nothing stops me." All items are measured on a seven-point Likert scale. The value of Cronbach's alpha was 0.86 in the Taiwan sample and 0.82 in the US sample.

2.2.2. Future time orientation

We used Orosz, Dombi, Tóth-Király, and Roland-Lévy's (2017) 17-item time perspective scale to measure future time perspective. This brief instrument was modified from the Zimbardo Time Perspective Inventory (Zimbardo & Boyd, 1999) with psychometric validation and future time orientation were assessed with four items. All items were measured on a five-point Likert scale. A sample item is "I am able to resist temptation when I know that there is work to be done". The value of Cronbach's alpha was 0.86 in the Taiwan sample and 0.75 in the US sample.

2.2.3. Self-perceived productivity

We used Bélanger's (1999) four-item scale to measure self-perceived productivity. A sample item is "I can work more effectively when I telecommute than I can when I am at the office." All items were measured on a seven-point Likert scale. The value of Cronbach's alpha was 0.86 in the Taiwan sample and 0.80 in the US sample.

2.2.4. Control variables

We controlled for four demographic variables, namely age, gender, educational level, and work tenure. These variables were selected because they could have confounded the results (Chen & Aryee, 2007).

3. Results

Before proceeding to the formal analysis, we performed data screening to ascertain the missing data, which was found to be insignificant. For this reason, we assume that the items missing are random and have therefore used a mean substitution with missing value (Cheung, 2007). Next, to ensure construct validity, we conducted a confirmatory factor analysis (CFA) of the main variables in both samples. In the Taiwan sample, the three-factor model had an appropriate fit index ($\chi^2[206] = 504.58$, comparative fit index = 0.92, non-normed fit index = 0.91, standardized root mean residual = 0.06, root mean square error of approximation = 0.06). In the US sample, we adopted 11 items of proactive coping and all three reversed items were subsequently deleted following CFA. Previous work by Schriesheim, Eisenbach, and Hill (1991) and Woods (2006) note that reverse items often suffer from careless responding and affect reliability estimates as well as factor structures. Accordingly, the US sample data showed appropriate fit index ($\chi^2[149] = 570.44$, comparative fit index = 0.86, non-normed fit index = 0.83, standardized root mean residual = 0.07, root mean square error of approximation = 0.07). In sum, the performance of the three-factor model was significantly greater than that of alternative models (see Table 2) based on the values of chi-square in the both samples, representing construct distinctiveness without common method variance concerns (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Next, means, standard deviations, and correlations for the Taiwan and USA samples are presented in Table 3. For both samples, positive correlations were significantly reported among examined variables and control variables were included in the hypothesis testing. To understand the differences between the main variables in the Taiwan and the U.S. samples, two correlation coefficients were also examined before hypothesis analyses. Hypothesis 1 predicted a positive association between proactive coping and self-perceived productivity, and the result was positive and significant in the Taiwan sample and the USA sample ($\beta = 0.25, p < .01; \beta = 0.22, p < .01$). Hypothesis 2 predicted that proactive coping is positively associated with future time orientation, and the association was also positive and significant in both samples ($\beta = 0.51, p$

Table 2
Comparison of Measurement Models for Main Variables Studied in Both Samples.

Model	Factor	χ^2	df	$\Delta\chi^2$	CFI	IFI	NNFI	SRMR	RMSEA
Baseline model	All of the indicators are independent	4084.09 (2879.76)	231 (171)						
3-Factor model	all variables were unique factor	504.58 (570.44)	206 (149)	-	0.92 (0.86)	0.92 (0.86)	0.91 (0.83)	0.06 (0.07)	0.06 (0.07)
2-Factor model	proactive coping and future time orientation were combined into one factor	934.59 (823.39)	208 (151)	430.01** (252.95**)	0.81 (0.75)	0.81 (0.75)	0.79 (0.72)	0.09 (0.10)	0.10 (0.11)
2-Factor model	proactive coping and self-perceived productivity were combined into one factor	1221.23 (1157.18)	208 (151)	716.65** (586.74**)	0.74 (0.63)	0.74 (0.63)	0.71 (0.58)	0.10 (0.11)	0.11 (0.13)
2-Factor model	future time orientation and self-perceived productivity were combined into one factor	1023.49 (942.70)	208 (151)	518.91** (372.26**)	0.79 (0.71)	0.79 (0.71)	0.76 (0.67)	0.08 (0.13)	0.10 (0.11)
1-Factor model	all variables were combined into one factor	1584.00 (1391.88)	209 (152)	1079.42** (821.44**)	0.64 (0.54)	0.65 (0.55)	0.61 (0.49)	0.11 (0.12)	0.13 (0.14)

Note. $N = 371$ in Taiwan and $N = 407$ in the U.S. The numbers in the parenthesis are data from the US sample.

Table 3
Means, standard deviations, and correlations of the variables.

	Mean	SD	1.	2.	3.	4.	5.	6.	7.
Control variables	Taiwan/ US	Taiwan/ US							
1. gender	-	-	-	0.03	-0.05	0.19**	0.01	0.06	-0.07
2. age	-	-	-0.13*	-	-0.11*	0.53**	-0.00	0.18**	0.10*
3. education level	-	-	-0.12*	0.06	-	-0.22**	0.11*	-0.07	-0.00
4. work tenure	-	-	-0.18**	0.75**	0.09	-	0.05	0.46**	0.05
Main variables									
5. proactive coping	2.89 / 3.04	0.32 / 0.52	-0.09	-0.01	0.23**	0.06	(0.86 / 0.82)	0.32**	0.22**
6. future time orientation	3.94 / 4.15	0.68 / 0.65	-0.04	0.12**	0.13*	0.17**	0.51**	(0.86/0.75)	0.27**
7. self-perceived productivity	4.41 / 5.23	1.22 / 1.21	-0.03	0.09	0.06	0.08	0.24**	0.46**	(0.86 / 0.80)

Note. $N = 371$ in Taiwan and $N = 407$ in the U.S. Internal consistency reliabilities are in parentheses. Taiwan’s correlational data was reported below the diagonal and the US correlational data was reported above the diagonal. * $p < .05$. ** $p < .01$.

$< .01$; $\beta = 0.30$, $p < .01$). Hypothesis 3 posited that future time orientation is positively correlated with self-perceived productivity, and the association was positive and significant in both samples ($\beta = 0.45$, $p < .01$; $\beta = 0.25$, $p < .01$). (Please see Table 4).

3.1. Mediating analyses

To test the mediating effect of Hypothesis 4, we used the Process macro (model 4; Hayes, 2012) and a bootstrapping analysis with 10,000 bootstrap samples to estimate the 95% confidence interval. For the Taiwan sample, the indirect effect index was 0.85, and the 95% confidence interval of the index was 0.55–1.18, which did not include zero. For the US sample, the indirect effect index was 0.17, and the 95%

confidence interval of the index was 0.07–0.30, which did not include zero. Therefore, in both samples, proactive coping had a positive, indirect effect on self-perceived productivity through its positive influence on future time orientation. However, future time orientation served as a full mediator in Taiwan’s sample but a parietal mediator in the US sample with different standardized coefficient strengths (please Figs. 1 and 2).

4. Discussion

The current study investigates the relationships of proactive coping, future time orientation, and perceived work productivity in the work-from-home experiences of employees during the COVID-19 pandemic, and tests for the mediating effect of future time orientation. The results suggest that future time orientation is a mediator of proactive coping and perceived work productivity in both samples; however, the strength of the mediating effect varies.

First, Hypothesis 1, which posited that proactive coping positively predicts perceived work productivity, is supported. This is consistent with previous research that demonstrates that individuals’ proactive work styles are generally associated with positive career outcomes (Cai et al., 2015; Seibert, Crant, & Kraimer, 1999). This finding is supportive of the COR theory in that stressful events do not necessarily lead to detrimental outcomes and individuals with higher proactive coping abilities are more likely to regard these challenges as opportunities and do not consider them as merely a loss of resources. This suggests that individuals with higher proactive coping abilities not only react to stressors, but also seek to manage resources actively for the purpose of implementing tasks efficiently, even during the COVID-19 pandemic.

Second, Hypothesis 2, which predicted that proactive coping is positively related to future time orientation, is also supported and is consistent with findings elsewhere in the literature (e.g., Zambianchi & Bitti, 2014). However, this result contradicts Aspinwall’s (2011) finding that future time orientation explains individual differences in proactive coping. We argue that future time orientation can be either a “state” (e.

Table 4
Indirect Effect of Future Time Orientation on the Relationship Between Proactive Coping and Self-perceived Productivity.

Variable	Future time orientation	Self-perceived productivity	Self-perceived productivity
	Taiwan / US	Taiwan / US	Taiwan / US
Control variable			
Gender	0.03 / -0.04	0.01 / -0.08	-0.01 / -0.07
Age	0.06 / -0.10	0.09 / 0.10	0.06 / 0.12
Education level	0.00 / -0.02	-0.00 / -0.04	-0.00 / -0.04
Work tenure	0.09 / 0.50**	0.00 / -0.01	-0.04 / -0.13
Main variables			
Proactive coping	0.51** / 0.30**	0.25** / 0.22**	0.02 / 0.15**
Future time orientation			0.45** / 0.25**
Total adjusted R^2	0.28** / 0.31**	0.06** / 0.05**	0.21** / 0.11**
F-value	29.08** / 34.46**	5.30** / 5.32**	16.10** / 7.71**
df	5, 365 / 5, 392	5365 / 5, 392	6, 364 / 6, 391

Note. $N = 371$ in Taiwan and $N = 407$ in the U.S. The values are reported as standardized regression coefficients. * $p < .05$. ** $p < .01$.

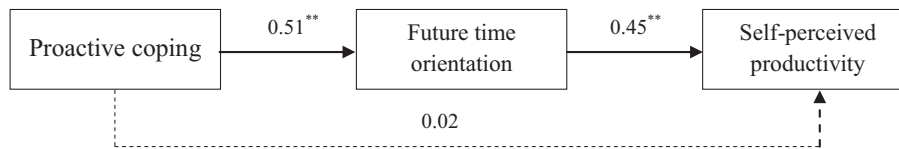


Fig. 1. The standardized results of hypothesized mediating model (Taiwan $N = 371$).

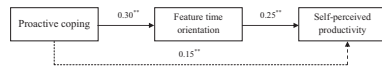


Fig. 2. The standardized results of hypothesized mediating model (U.S. $N = 407$).

g., depending on the contexts) or “trait” construct (e.g., stable personality characteristics) (Steyer, Schmitt, & Eid, 1999). As Zimbardo and Boyd (2008) have reported, an individual’s time orientation is adaptable, and most people can change their temporal orientation in various contexts or according to life experiences. In this study, proactive coping represents a take-charge and growth-oriented mindset that can activate future time orientation in an individual with concrete self-mentalization. For example, an individual can direct cognitive attention to finish the assigned work for a future benefit; thus, future time orientation is conceptualized as a “state” construct during COVID-19.

Third, Hypothesis 3, which posits that future time orientation is related to perceived work productivity, is supported. This finding is consistent with those in previous studies regarding the link between future time orientation and desirable work outcomes. For example, Kooij, Kanfer, Betts, and Rudolph (2018) conducted a meta-analysis review and reported that future time orientation is positively associated with major work consequences. Thus, an individual’s capacity to consider the future represents the use of cognitive resources to focus on work behaviors that will be beneficial in the future (Andre, van Vianen, Peetsma, & Oort, 2018), which in turn positively influences work productivity.

Finally, Hypothesis 4, which predicted a mediating effect between proactive coping and perceived work productivity through future time orientation, is supported. This result is consistent with findings made by other scholars about the role of future time orientation as a crucial mediator between individual predecessors and behavioral consequences (e.g., Henry, Zacher, & Desmette, 2017). Such a role may be involved in a protective mechanism against disruptive work behaviors (Carvalho, 2015). However, the strength of the mediation differed between the two samples. For an Eastern culture such as that of Taiwan, proactive coping is closely linked to future time orientation, which serves as a stronger mechanism between proactive coping and perceived work productivity. As in other Asian countries, Taiwan has a collectivist culture that highly values long-term planning for an improved future (Tian & Heppner, 2018). In the context of such a culture faced with COVID-19, individuals tend to possess a “we” mentality, which reflects psychological togetherness toward a common goal to overcome challenges and aim for a better tomorrow. For example, self-health management instructions during the COVID-19 pandemic have been proactive in Taiwan (Taiwan Center for Disease Control (Taiwan CDC, 2020) and people are well informed about what to do in medical, social, and schooling situations. Thus, proactive coping and future time orientation may be strengthened in such an environment, which explains the higher effects reported compared to cultures that are more individual-oriented.

4.1. Implications

This study extends the current understanding about the relationship between proactive coping, future time orientation, and perceived work productivity during the COVID-19 pandemic. Theoretically, the results of this study are consistent with the principles of the COR theory

(Hobfoll, 1989, 2002) and expand the context in which COR theory may be applied. In particular, the study demonstrates the importance of improving our understanding through further study of time orientation during uncertain situations. While Hobfoll, Halbesleben, Neveu, and Westman (2018) report that the role of time in the COR theory is often limited to time allocation for resources or the timing of resources, this study makes a significant theoretical contribution by showing that time orientation alone can be a personal resource and act as a mediator in the link between resources and positive adaptation.

One practical implication of the results of this study is that programs that target the proactive coping and future time orientation of individuals can be viewed as beneficial strategies for increasing the affected individuals’ personal resources. As concluded by Bodem, Ridder, Kuijter, and Bensing (2007), proactive coping can be conceptualized as a set of competencies that serve as transferable skills for designing relevant interventions. During the COVID-19 pandemic, organizations can offer updated information and telework guidelines to their employees (e.g., how to report work progress effectively via digital technology). Such measures will increase employee visualization of upcoming adjustments, thereby promoting proactive coping by employees. The employees can in this way be directed toward goal management and remain proactive during telework rather than passively working alone. The study results are also of practical relevance to psychologists and professionals, who will be able to review proactive coping and future time orientation in the context of work assignments and incorporate them into future employee training sessions.

4.2. Study limitations and scope for future research

This study is not without its limitations, despite its theoretical and practical contributions. First, its broad conclusions are drawn from a limited sample of single countries (Taiwan and the U.S.) that are chosen to represent Eastern and Western cultures, respectively. Moreover, the two countries have reported significantly different numbers of COVID-19 infections and related deaths during the pandemic (WHO, 2020). Thus, the cultural context variable seems to be confounded by socio-demographic differences as well as differences in the dynamic of the pandemic itself. It would therefore be essential for future research to examine proactive coping and future time orientation in relation to telecommuting productivity in other culturally diverse populations, as well as in those countries that have been affected differently by COVID-19. For example, further research could be undertaken to clarify the effect of individualistic-collectivist cultures on the examined variables as well as other resources that influence the effectiveness of telework. Second, it would also be valuable to investigate other potential mediators or moderators between examined constructs, since an individual’s perception of stress during the COVID-19 pandemic may affect the strength of the relationship between proactive coping and perceived work productivity. Third, the data used in this study were collected using a self-report survey, and the performance measurement of productivity, which can be influenced by social desirability concerns, is not objective. Moreover, the cross-sectional research design does not permit causal inferences to be drawn from the data. In conclusion, while the risks and uncertainties in life have been exacerbated by the COVID-19 pandemic, this study reveals how people are able to face the challenges it poses and what strategies could be adopted for other uncertain life circumstances.

CRedit authorship contribution statement

Yuhsuan Chang: Conceptualization, Investigation, Methodology, Visualization, Funding Acquisition, Writing - original manuscript, Writing - review & editing.

Chuang-Rei Chien: Conceptualization, Methodology, Data collection, Data analyses, Visualization, and Result Writing - Editing.

Li-Fang Shen: Conceptualization, Data collection and Methodology

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.paid.2020.110508>.

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