

# Influence of COVID–19 Anxiety on Vigor and Innovative Work Behavior: Mediated Moderation of Flexible Work Arrangement

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## Abstract

The present study examines the impact of COVID-19 anxiety on employees' psychological resources and behaviors, drawing on the conservation of resources theory. We also investigate whether flexibility in work contexts has a meaningful effect on employees' responses to the pandemic. A total of 284 working adults participated in an online survey consisting of self-reporting questionnaires that assessed levels of COVID-19 anxiety, vigor, innovative work behavior, and flexible working arrangements. The results showed that the level of vigor mediated the positive relationship between COVID-19 anxiety and innovative work behavior, and the perceived level of flexible working arrangements moderated this mediation effect positively. The findings highlight the importance of considering employees' psychological resources and work arrangements in managing the negative impact of COVID-19-related anxiety. This study provides theoretical and practical implications for organizations to better understand the psychological processes that employees undergo during a crisis. Further research on diverse work settings and cultural backgrounds is needed to expand on the present findings.

**Key words:** Anxiety, COVID-19, Flexible Work Arrangement, Innovative Work Behavior, Vigor

## 1. INTRODUCTION

The current research investigates the psychological effect from the catastrophic subject that has been occupying the global citizens for years, COVID-19 (Petee, 2020; Jang et al., 2021). The investigation is specifically on the employees at workplace since there have been limited academic highlight on them. The major focus of the COVID-19 and workplace study was on the jobs directly related to the pandemic (e.g., nursing) (Labrague & De los Santos, 2020).

As the pandemic catalyzed alternative working modes (e.g., working from home, social distancing) and unfamiliar stress (e.g., feeling isolated, technical diffi-

culties regarding virtual work) (Kniffin et al., 2021), the psychological damage from adapting to the dramatic changes and tolerating the social distances have become the important agenda (Galanti et al., 2021). Clarifying the psychological and behavioral reaction toward COVID-19 is expected to help understanding the effective factors to maintain employees' motivation during the crisis (Khan, 2021).

More importantly, we explore the organizational context that affects the influence of COVID-19. Flexible working hours and location were first viewed as a mean to obtain social distance and minimize the risk of the spread of the virus. While the physical utility of such changes in working modes has been repeatedly dis-

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cussed (e.g., Lopez-Cabrales & DeNisi, 2021), the psychological aspects also needs more attention. We investigate if those flexibility affects the employees under the pandemic concerns.

### 1.1. COVID-19 Anxiety and Conservation of Resource Theory

Multiple researchers have proved the actual influence of COVID-19 on everyday life and the workplace. As a result of COVID-19, individuals experience lower life satisfaction (Duong, 2021), happiness (Kroencke et al., 2020), and more loneliness and worries (Tull et al., 2020).

The influence of COVID-19 is significant even when living and working without direct infection. Measurements of the general anxiety level caused by COVID-19 have been proposed to track the influence on the general mental health of the people. Defined as the degree of obsession with COVID-19 hazard, “COVID-19 anxiety” reflects if a person is thinking ‘too much’ about it (Lee et al., 2020). The level of COVID-19 anxiety among employees has a negative correlation with low performance in certain tasks (Aguiar-Quintana et al., 2021) and job engagement (Chanana & Sangeeta, 2021; Khan, 2021). Results illustrate that people experience negative effects just by thinking hard about COVID-19.

In order to explain the consequence of COVID-19 anxiety, we adopt the frame of conservation of resource theory (COR theory) (Hobfoll, 1989). According to the theory, the amount of resources within an employee fluctuates depending on the conditions, and the level of resources accelerates or decelerates their accumulation (Hobfoll, 1989). When a resource is under threat, employees react depending on what is currently available.

To capture the psychological resources of the employees in the study, we examined the level of vigor. Vigor is defined as “individuals’ feelings that they possess physical strength, emotional energy, and cognitive live-

liness, and represents a moderate-intensity effect experienced at work (Shirom, 2011).” As it stands for the state in which employees are willing to make efforts to establish the achievement or to overcome the difficulties, we assumed that employees’ intention to reserve or invest psychological resources corresponding to COVID-19 anxiety will be captured at the level of vigor (Schaufeli et al., 2002). That is, the vigor in the current study stands for the investment propensity of psychological resources rather than a snapshot of the resources. For example, when the work context “mobilized” the pre-occupied resource of the employees under COVID-19 worries, the resource was invested back into the vigor (Bakker & van Wingerden, 2021).

COR argues that employees dedicate individual energy to other work activities, reflecting their need or desire to counter the negative consequences of being exposed to resource-draining conditions (Hobfoll, 2001). Employees either consume more mental energy to abort the negative factors affecting their resources, or adjust their behavior in a way that is congruent with the negative factors in order to stop wasting energy. This rationale enables us to presume the process of adjusting the behavior in order to prohibit resource exhaustion when employees are threatened to lose psychological resources due to the pandemic.

The resource draining condition, or high COVID-19 anxiety, alerts employees to increase their efforts to build more resources. Proactive behavior to gain resources follows, and such behavior and the accumulated resources reciprocally enhance each other. The point is that effortful behavior is initiated by the resource-draining condition.

We use innovative work behavior to explain employees’ efforts to gain resources. This proactive behavior includes ideation, execution, reaction to others’ ideas, and modification of existing ideas (Janssen, 2004). Innovative employees voice new ideas, try alternative methods, and challenge the status quo to improve their

roles, departments, and organizations. (Janssen, 2004; Carmeli et al., 2006; Kanter, 1988; Scott & Bruce, 1994; West & Farr, 1989; Farr & West, 1990; Shalley et al., 2004; Zhou & Woodman, 2003).

Innovative work behavior is strongly associated with better performance, which can lead to social stability, a positive reputation, and financial rewards (Gong et al., 2009; Ng & Feldman, 2009). It also demonstrates an ability to adjust to ambiguity and rapid change by reacting with agility (Basadur, 1992, 1997; Basadur et al., 2000), which enhances an employee's potential for success. Engaging in innovative work behavior can result in credit and recognition in the workplace (Farr & West, 1990; Kanter, 1984; Woodman et al., 1993; Yuan & Woodman, 2010). In other words, innovative work behavior is a strategic and voluntary act that can lead to a diverse range of benefits.

Innovative work behavior is often a consequence of abundant resources. To encourage it, various human resource practices have been implemented, including supportive leadership and a positive work-life balance (Hughes et al., 2018; Ma Prieto & Pilar Pérez-Santana, 2014; Mishra et al., 2019). These studies indicate that psychological resources are a common source of innovative work behavior, which involves proactive extra effort beyond minimum obligations (Montani et al., 2017).

We examine the roles of vigor, resource-draining conditions (such as COVID-19 anxiety), and resource-building efforts (such as innovative work behavior) to explain the mediated effect. We propose that COVID-19 anxiety may motivate employees to enhance their psychological resources, which is expected to be reflected in higher vigor. In turn, meeting vigor requirements may lead to greater innovative work behavior. Furthermore, COVID-19 anxiety may also influence innovative work behavior as employees develop strategies to secure their jobs. Specifically, higher anxiety levels may stimulate employees to build additional resources, such as suppor-

tive relationships and new skills, to guard against resource depletion and align their behavior with organizational goals.

### **H1. Vigor will mediate the positive relationship between COVID-19 anxiety and innovative work behavior.**

## 1.2. Flexible Work Arrangement

Flexible work arrangement, the degree of freedom and independence perceived by the employees who make daily decisions on when and where to work, can be a case (Eaton, 2003). It is an individual evaluation of the organization's tolerance or respect to the choices of working modes. According to COR, employees' resources, which refer to things that are valued, can be diverse as material, social, and a form of energy in psychological sturdiness (Shirom, 2011). The feeling of control and certainty is a critical part of employees' psychological resources (Cheng et al., 2014). An unpredictable crisis as a pandemic is a resource-draining condition. Uncertainty and bewilderment with COVID-19 constantly drain employees' psychological resources (Ahorsu et al., 2020; Swaminathan & Mishra, 2020). Contrastingly, flexible work is a resource reservation. Choosing a place and time to work based on individual preference and being able to control the social distance as much as possible to keep safe could protect the psychological resources that otherwise may be taken away by COVID-19 anxiety.

Specifically, the feeling of control to stay away from the infection could prevent unnecessary waste of psychological energy. The fear of the pandemic, which largely originates from the loss of control to protect self and beloved ones from harm, could be reduced when employees are confident about having the autonomy to keep their distance from the risk. Having distance from unexpected social contacts and overwhelming in-

formation can also preserve employees' perceived power to get through the pandemic.

Multiple study results indicate that flexible work arrangements have a positive impact on job outcomes. For example, job satisfaction level was higher and turnover intention was lower when flexible work arrangements were allowed for professional employees (Almer & Kaplan, 2002). Employees' health conditions are positively related to the availability of flexible work arrangements (Grzywacz et al., 2008). One of the ways that we expect flexibility to support the psychological resources under pandemic risk is to directly restore the overall energy. Free choice of working modes and space may build up the overall level of employees' psychological resources (Vischer, 2007).

The literature on employee autonomy supports the role of flexible work arrangements in building positive job assets. It is the belief in how much the organization officially supports employees to mitigate adverse work conditions during the pandemic (Goolsby, 1992). The perceived level of control within the workplace has positive effects on employee well-being, especially in adverse conditions (Kim & Stoner, 2008; Slemp et al., 2015). Job autonomy buffers the relationship between under-employment and subjective well-being in individualistic cultures (Wu et al., 2015). High level of autonomy is perceived as the possibility of keeping a "boundary" from the source of risk of disease and infection (Rapp et al., 2021).

Taken together, we expect that psychological resources are reserved against COVID-19 anxiety under the resource-filling condition (e.g., flexible work arrangement). When a flexible work arrangement is available, the loss of resources may occur less than when a flexible work arrangement is not available. A high level of autonomy to keep the distance within the workplace, for instance, may mitigate the negative impact of the COVID-19 hazard.

## **H2. A flexible work arrangement is expected to positively moderate the impact of COVID-19 on employee vigor.**

The interacting role of flexibility in work arrangements on innovative work behaviors along with mediation is also important. As a resource-reserving condition, flexible work contexts are expected to contribute to innovative work behaviors (Bakker & Demerouti, 2007; Korunka et al., 2009). Flexibility allows the independence to navigate diverse alternatives without social pressure (Zettle et al., 2015). It also gives employees the power to challenge beyond the regulation without worrying about losing (Albort-Morant et al., 2020). Therefore, a flexible work arrangement is expected to lower the cost of innovative work behavior by preventing the possibility of wasted resources.

One of the critical aspects of a job that determines the possibility of employees to behave in innovative ways is the amount of approved freedom and independence (Ramamoorthy et al., 2005). Ironically, employees are known to do things that are not required, such as innovating or trying different methods to improve the current condition, when they are not strictly required to behave in defined ways (Fernandez & Moldogaziev, 2013). The perceived level of control in terms of working is critical to define the psychological resources that employees can reinvest in doing more work, such as innovative work behavior. As much as flexible work arrangement is resource-filling, it is likely to build up more resources for innovative work behavior.

Based on the expected role of flexible work arrangements on innovative work behavior and resource conservation, we hypothesized that flexible work arrangements will moderate the mediation effect of vigor between COVID-19 and innovative work behavior. A flexible work arrangement that fills and reserves resources (e.g., vigor) would interact with how innovative work behavior is stimulated by the COVID-19 anxiety and

vigor. The process of reinvesting the resource against the threat of more loss, or reinvesting the vigor to behave in more innovative ways to act against COVID-19 anxiety will be accelerated under higher flexibility in work arrangements. Employees are expected to use the resource or vigor, that is reserved in response to COVID-19 anxiety, to behave in more innovative ways when they perceive high flexibility at work.

**H3. Flexible work arrangement is expected to positively moderate the mediation effect of the employees' vigor between COVID-19 anxiety and innovative work behavior.**

## 2. METHOD

### 2.1. Subjects

An online survey was conducted among a sample of 286 employed adults via Amazon Mechanical Turk. Participation was limited to the residents of the United States of America who indicated themselves as being "employed and 20 years or older." All items except demographic variables were measured on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

### 2.2. Measures

**COVID-19 Anxiety** was measured using four items from the Obsession with COVID-19 Scale (Ashraf et al., 2022). A sample item for COVID-19 anxiety is "I had disturbing thoughts that I may have caught the coronavirus." The internal consistency reliability of the scale was good ( $\alpha = .90$ ).

**Vigor** was measured using three items from a shortened version of the Utrecht Work Engagement Scale (UWES-9) (Schaufeli et al., 2006). A sample item for

vigor is "At my work, I feel I am bursting with energy." The Cronbach's  $\alpha$  was .78.

**Innovative work behavior** was measured using nine items (Janssen, 2001). The measurement was originally developed for supervisor ratings but was justified later for self-reporting. A sample item is "How often do you create new ideas for improvements?" In this study, Cronbach's  $\alpha$  was .93.

**Flexible work arrangement** was measured with five items (Mache et al., 2020). A sample item is "I decide where (office, home, elsewhere) and when I work." In this study, Cronbach's  $\alpha$  was .68.

**Control variables** Based on previous studies on vigor and innovative work behavior work, control variables were included in the analysis as follows: gender (male = 1, female = 0), age, educational level (High school diploma or equivalent degree = 1, Bachelor's degree = 2, Master's degree or more = 3), and contract status (self-employed = 1, others = 0).

## 3. RESULTS

The collected data were analyzed using SPSS 24.0 and the SPSS PROCESS Macro (Hayes, 2013). Gender (60% male), age ( $M = 33.67$ ,  $SD = 10.00$ ), education level (90.8% received 4 years of college education or more), and contract status (1.8% self-employed) were controlled for in the entire analysis. Results showed that COVID-19 anxiety ( $M = 4.57$ ,  $SD = 1.75$ ) was positively related to both vigor ( $M = 5.48$ ,  $SD = 1.10$ ) ( $r = .31$ ,  $p < .01$ ) and innovative work behavior ( $M = 5.43$ ,  $SD = 1.07$ ) ( $r = .36$ ,  $p < .01$ ), while vigor showed a moderate correlation with innovative work behavior ( $r = .56$ ,  $p < .01$ ). Similarly, flexible work arrangements ( $M = 5.20$ ,  $SD = 1.09$ ) showed moderate levels of correlation with both vigor ( $r = .42$ ,  $p < .01$ ) and innovative work behavior ( $r = .56$ ,  $p < .01$ ).

The measurement model consisting of four factors

(i.e., COVID-19 anxiety, vigor, innovative work behavior, and flexible work arrangement) was then tested. The chi-square statistic was found to be significant,  $X^2(183, N = 285) = 400.60, p < .001$ . The other fit indices were acceptable (CFI = .94, RMSEA = .07). All items were loaded to their latent variable ( $p < .001$ ), with a standardized factor loading between .46 and .89. An alternative measurement model in which COVID-19 anxiety, vigor, innovative work behavior, and flexible work arrangements were fixed to a single latent variable showed no better fit to the data ( $[185] = 411.87, CFI = .93, RMSEA = .07$ ). The model with the common method factor had no better fit ( $[162] = 301.06, p < .001, CFI$

= .96, RMSEA = .06) than the four-factor model, with no dramatic improvement in indices. Therefore, the confounding effect of common method variance was ruled out.

To test H1, we verified the statistical significance of the mediation effect by generating tests of the indirect effects with 5,000 bootstrapped samples and bias-corrected confidence intervals using SPSS PROCESS Macro Model 4 (Hayes, 2013). We centered all the data to the mean before conducting further analysis. Vigor positively mediated the relationship between COVID-19 anxiety and innovative work behavior (indirect effect = .11, SE = .03, 95% CI [.06, .16], direct effect = .11, SE = .03, 95% CI [.05, .17]).

Table 1. Mediation effects of vigor on COVID-19 anxiety and innovative work behavior

	<i>b</i>	SE	<i>p</i>	
<b>Outcome: Vigor</b>				
Covid-19 Anxiety	.20	.04	.00	
<b>Outcome: Innvative Work Behavior</b>				
Covid-19 Anxiety	.11	.03	.05	
Vigor	.54	.05	.00	
<b>Mediation Index (Mediator: Vigor)</b>				
	Index	SE	LLCI	ULCI
Indirect	.11	.03	.06	.16
Direct	.11	.03	.05	.17

The moderating effect of flexible work arrangement on the relationship between COVID-19 anxiety and vigor was positive and significant ( $b = .12, t(276) = 4.22, p < .001$ ), supporting H2. More specifically, the relationship between COVID-19 anxiety and vigor was not significant when flexible work arrangement is one standard deviation lower than the mean ( $b = -.03, t(276) = -.68, p = .49$ ). However, when the flexible work arrangement was one standard deviation above the mean or at the mean, the relationship was positive and significant (+1SD:  $b = 1.09, t(276) = .05, p < .001$ , Mean:  $b =$

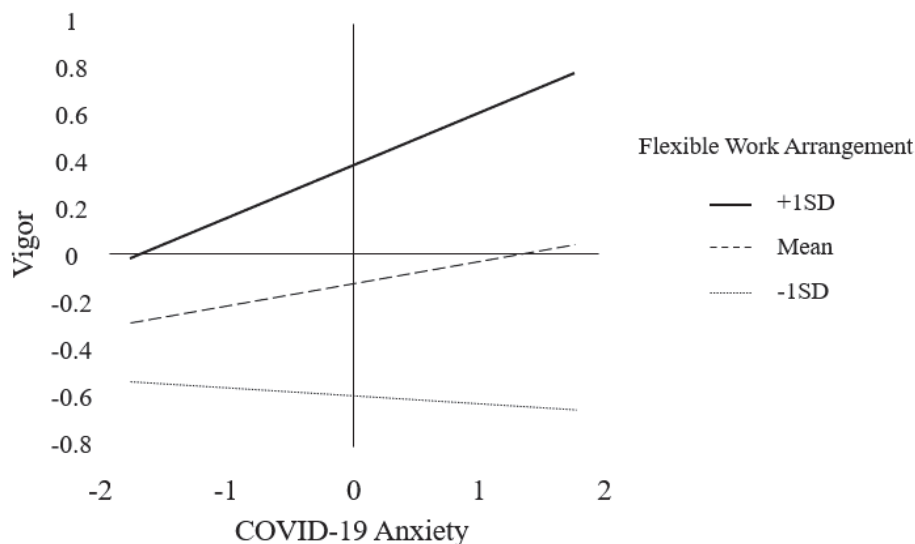


Fig. 1. Moderation effect of flexible work arrangement on COVID-19 anxiety and vigor

.00,  $t(276) = 2.48, p < .05$ ). The interaction effect explained an additional 4% of the variance in vigor.

To assert the moderated mediation effect, the interaction of the hypothesized moderator on the relationship between independent and outcome variables should be significant (Muller et al., 2005). Accordingly, using SPSS Macro Model 1 (Hayes, 2013), the moderation of flexible work arrangement on the effect of COVID-19 Anxiety on innovative work behavior was examined.

Table 2. Results of moderated mediation analysis (COVID-19 anxiety: CA, Flexible Work Arrangement: FWA, Innovative Work Behavior: IWB)

	<i>b</i>	SE	<i>p</i>	
<b>Outcome: Vigor</b>				
CA	.09	.04	.01	
FWA	.46	.07	.00	
CA x FWA	.46	.07	.00	
<b>Outcome: IWB</b>				
CA	.11	.03	.00	
Vigor	.54	.05	.00	
<b>Conditional Indirect Effects of CA on IWB at Values of FWA</b>				
FWA	Effect	SE	LLCI	ULCI
-1SD	-.02	.05	-.11	.07
+1SD	.21	.05	.12	.30
<b>Moderated Mediation Index (Mediator: Vigor)</b>				
	Index	SE	LLCI	ULCI
	.06	.02	.02	.11

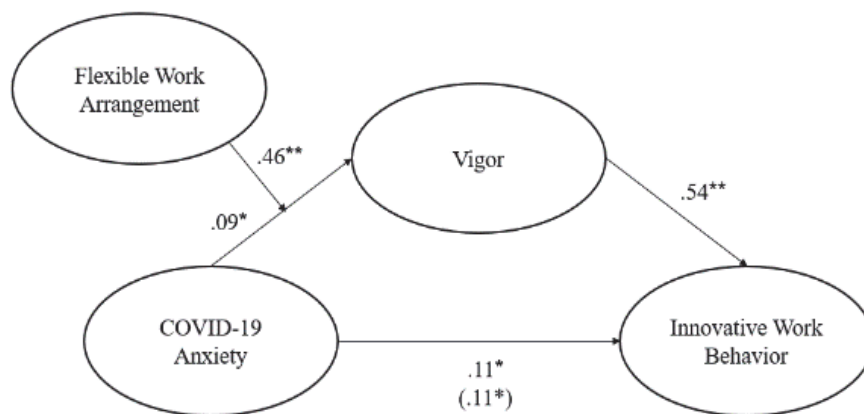
Based on the confidence interval, which does not include zero, the prerequisites for moderated mediation were satisfied ( $b = .05, t(276) = 1.89, p = .06, CI [.00, .01]$ ).

Finally, moderated mediation was examined using the SPSS Macro Model 7 (Hayes, 2013). The bootstrap confidence intervals for the index of moderated mediation did not include zero, and the difference among the conditional indirect effects was significant (index of moderated mediation = .06, SE = .02, CI [.02, .11]). The indirect effect of COVID-19 anxiety on innovative work behavior through vigor was significant for individuals with one standard deviation high flexible work arrangement (indirect effect = .11, 95% CI [.05, .17]). In contrast, the indirect effect was not significant at one standard deviation, low flexible work arrangement (indirect effect = -1.00, CI [-.08, .06]). In sum, the moderated mediation effect was statistically significant, supporting H3.

Fig. 2 illustrates the hypothesized model of the current research along with the discovered effect on each path.

### 4. DISCUSSION

One noteworthy finding in the current research is that employees who are more anxious about COVID-19 are more hesitant to spend their mental resources, which in turn affects their vigor and innovative work behavior.



\*\*  $p < .01$  \*  $p < .05$

Fig. 2. Path diagram of research variables and coefficient effects

This result is consistent with Conservation of Resources theory (COR) and previous studies on the effects of catastrophic events (Hobfoll, 2001). Experts who deal with terror management theory argue that information about a catastrophe can predispose people to thoughts related to mortality and trigger anxiety (Hu et al., 2020). The anxiety caused by the potential risks of COVID-19 had a significant effect on employees' mental resource, vigor.

A similar notion explains the positive effect of COVID-19 anxiety on innovative work behavior. Referring to recent research reports that employees who are more worried about the pandemic are more likely to interact with colleagues as a defense against anxiety (Clercq & Pereira, 2021), we interpret this finding as employees with high COVID-19 anxiety are likely to make more efforts to build a strong position within the career by acting in a direction that is congruent with the organization's success and favorable to the organization. In other words, we supported previous research streams that view innovative work behavior as a consequence of the fulfilled resource and a strategic reaction with high crisis sensitivity. Proactive intention to react against the stress of the pandemic seems to build up psychological resources and lead to innovative work behavior.

According to the result, flexibility seems to motivate employees to invest resources to counter the negative impact from anxiety regarding COVID-19. The relationship between COVID-19 and vigor was significant and positive only when employees perceived high flexibility in work arrangements. The flexible work arrangement moderated the mediation effect of vigor as well. Power and opportunity to arrange how and where to work is likely to function as a reservoir of resources. Therefore, employees who are anxious about the pandemic but also perceive high flexibility in work arrangements are likely to rebuild vigor as a counteract against pandemic threats. The psychological resource is successfully reserved and reinvested against COVID-19 anxiety, which allows em-

ployees to behave in more innovative ways. Employees who do not have flexibility in work arrangements are less likely to make extra efforts to protect their vigor and invest into the innovative work behavior, even if they perceive high anxiety about the pandemic.

The current study provides empirical evidence based on the very specific event, COVID-19. However, broadened discussion on the employees' general anxiety caused by contemporary and universal influence may began from the current findings. The current research shows that the pandemic has a pervasive effect on the psychological resources and job behavior of employees, even in common workplaces.

However, one limitation of the current research is that it does not identify a specific motivational trigger for anxious employees to conserve their mental energy. Future research could investigate this topic more thoroughly, for example, by exploring the role of employees' efforts to fit in with the organization (Kristof-Brown et al., 2005). Additionally, it may be worthwhile to consider using diverse indicators that reflect an employee's resources beyond the level of vigor.

This study also supports the distinguished and positive role of flexible work with empirical data, especially under adverse work conditions. Flexible work arrangement is expected to decide how employees handle the anxiety caused by COVID-19. Even though it has been proposed as a remedy for multiple problems such as low job market or work-family conflicts for a long time (e.g., Lenz, 1996), not much of the academic research has investigated the detailed psychological process of employees taking advantage of flexible work arrangement.

Even though it was our practical choice not to limit the job types for our data to allow deviation in the flexible work arrangement, future research can narrow down the view to the specific work context. The application of flexible work could have diverse cons and pros depending on the job type. Cultural and governmental reactions to disease control also evolves into very different



forms (Huynh, 2020). Further research on diverse job situations and cultural backgrounds is expected to amend a weakness of the current research. A longitudinal study regarding the adjustment to the situation and insensitivity to the risk can also improve the limitation of the cross-sectional data (Maxwell & Cole, 2007).

## 5. CONCLUSION

While our study is limited to a small aspect of the broader impact of global issues on employees, we believe our findings provide valuable insights for managers navigating the pandemic crisis and striving to maintain positive job outcomes for their employees. Additionally, we hope our research serves as a helpful reference for scholars interested in exploring the nuances of employee adaptation to global changes. However, we acknowledge the need for further investigation into this complex and evolving topic.

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