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Abstract

The current study examines whether the prevalence of COVID-19 cases and cultural flexibility correlate to one's use of acceptance coping across 26 cultures. We analyzed data from 7476 participants worldwide at the start of the first outbreak from March 2020 to June 2020. Results showed that cultural flexibility moderated the relationship between COVID-19 cases and individuals' acceptance coping strategies. Specifically, for cultures with high flexibility, COVID-19 cases correlated with more acceptance coping; for cultures with low flexibility, COVID-19 cases correlated with less acceptance coping. This result demonstrates how participants from flexible cultures can coexist with the realistic challenges and suffering faced during this pandemic.

Keywords: Acceptance coping, cultural flexibility, COVID-19 prevalence.

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COVID-19 has caused immense suffering worldwide, and people in different cultures have reacted differently. While some have accepted and learned to live with the situation, others have struggled. This study aims to investigate how the prevalence of COVID-19 and a new cultural trait, cultural flexibility, influence coping strategies across cultures.

The Relationship between COVID-19 Cases and Coping Strategies

The way people coped with the sudden increase in COVID-19 cases at the start of the pandemic is still an area of research that deserves attention. Previous studies have shown that people living in areas with a high prevalence of COVID-19 cases often experience higher stress levels (Green et al., 2021). Coping strategies can help reduce the adverse effects of stressful situations, particularly when applied appropriately (Bamuhair et al., 2015). Coping also lessens feelings of distress from negative experiences by using mental and behavioral strategies to manage stress-related issues (Carver, 2013; Tuason et al., 2021). Acceptance coping is a widely adopted coping strategy that aims to help individuals adapt to the situation rather than actively control or change it (Polizzi et al., 2020). Instead, people adjust some aspects of themselves and accept the circumstances as they are (Fisher et al., 2021). This type of secondary control coping contrasts with primary control coping, which involves attempts to control the stressor itself (Gaudreau, 2018; English & Zhang, 2020).

Although using different coping strategies under different stress levels has been well-researched, the results have not always been consistent. While some studies found that stress was negatively related to acceptance or other secondary "fit" coping strategies (i.e., fitting oneself into situations instead of influencing situations), other studies found contradictory or non-significant results. For instance, Labrague et al. (2017) found that stress was negatively related to secondary control coping (i.e., staying optimistic) in a sample of nursing students from Greece, the Philippines, and Nigeria. In contrast, another study found the relationship between distress and secondary coping was positive in East Asian Canadians but non-significant in European Canadians (Han et al., 2022).

The early days of the global pandemic provide a unique opportunity to explore the relationship between COVID-19 cases and individual-level coping strategies. Baloch et al. (2021) found no significant relationship between stress during COVID-19 and acceptance coping in a sample of college students in Pakistan. Alongside the aforementioned studies that found inconsistent results from different cultural samples (i.e., participants from Greece, the Philippines, Nigeria, Canada, and East Asia), the inconsistency between stress and acceptance coping could be attributed. Another reason for the observed inconsistencies maybe the different contexts in which the data were collected. For example, Italy was one of the countries most affected by the Covid-19 pandemic, especially at the beginning. Paolini et al. (2022) found, with a sample of non-students during the lockdown period, that activating broader and therefore more flexible social identification, such as with all of humanity, led to greater trust towards social and political actors. This, in turn, can help individuals reduce the stress caused by the restrictive conditions during the Covid-19 lockdown.

It is possible that some cultures enable while others hinder acceptance coping to manage the high stress triggered by this pandemic. This study proposes that flexibility-monumentalism, a cultural trait, could potentially moderate the relationship between the prevalence of COVID-19 cases and the usage of acceptance coping, providing an explanation for the inconsistency in previous findings.

Flexible Societies Moderate the Link between COVID-19 Cases and Acceptance Coping

Flexibility-monumentalism, or flexibility for short, is a newly discussed cultural trait proposed by Minkov et al. (2018). The authors postulate that cultures with higher levels of flexibility exhibit a stronger ability to coexist with suffering and discomfort, and individuals in these cultures reflect a flexible and practical ability to adjust to different situations. For example, East Asian cultures tend to have greater flexibility, while cultures with higher levels of monumentalism tend to hold unalterable values and beliefs. Individuals in these cultures tend to prefer self-consistency across contexts and situations and prefer to satisfy their desires instead of suppressing them. Cultures in Latin America and Africa tend to have greater monumentalism.

Because flexible cultures tend to encourage people to live with suffering, it is possible that these cultures can more easily accept the increasing severity of COVID-19. Research has shown that countries in East Asia performed better with fewer COVID-19 cases and less COVID-19 related deaths compared to the rest of the world (Talhelm et al., 2022). Another relevant study found that societal levels of flexibility were positively related to the reduction in mortality in COVID-19 (Li et al., 2022). Previous studies also found that Eastern cultures favor secondary control coping more than Western cultures (Han et al., 2022), and that secondary coping functions better in Asian cultures than in Western cultures (Szabo et al., 2017).

Therefore, we hypothesize that cultural flexibility moderates the link between COVID-19 cases and acceptance coping. Specifically, for cultures with high flexibility, situations with more COVID-19 cases correlate to more acceptance coping, while for cultures with low flexibility, situations with more COVID-19 cases correlate to less acceptance coping.

Figure 1. The Map of 26 Cultures Involved in Formal Analyses.

Method

Participants

This research is affiliated with a larger project that received ethical approval from XX University (Research Project Protocol XX). The current research recruited participants from around the world through a Global COVID-19 Online Survey (anonymized link). It was conducted by the XXX Institute in collaboration with researchers around the world during the

first wave of the pandemic. Participants joined this study through Qualtrics. Participation in this research was voluntary. At first, we recruited 9702 participants from 99 countries from March 2020 to June 2020. To follow the General Data Protection Regulation (GDPR), we excluded the participants who were under 18 years old. In addition, in order to get valid results, we only included countries with at least 30 participants, had flexibility scores from Minkov et al., (2018), and have records of daily COVID-19 cases at the time of data collection. In the end, 7476 participants (M_{age} = 31.86, SD_{age} = 12.97, 60.42% female) from 26 cultures (see Figure 1) were included in the final analyses. The details about the demographic information by culture are presented in Table S2 in supplemental materials.

Measurements

Coping strategies. Acceptance coping was measured by 3 items using a coping strategy scale (brief COPE; Carver, 1997). An example item is: "I accept the fact that this happened." Participants rated the items from 1 (*won't do this*) to 4 (*often do this*). The brief COPE consists of 8-item, with 3 items measuring acceptance coping and 5 items measuring adaptive coping (see Table S5 and Figure S1 in online supplemental materials). The two-factor solution of the brief COPE fits the data best across cultures because this factor structure, with two correlated factors, achieved measurement invariance across countries (refer to Table S6 in the supplementary materials). McDonald's Omega for acceptance coping was .74.

Cultural flexibility vs. monumentalism. The flexibility versus monumentalism country scores were from Minkov et al. (2018). The scores were derived from seven items that each contained three options: 1 for monumentalism (e.g., I have strong values and beliefs that guide my behavior in most situations), 2 for neutral, and 3 for flexibility (e.g., My behavior is contingent on the situation, less influenced by my values and beliefs). Factor analysis of these items per country yielded a "flexibility" versus "monumentalism" unifactorial solution. Factor scores, multiplied by 100, represent country scores; higher scores indicate more flexibility and lower monumentalism. For example, the score for Japan is 234, while the score for Italy is -36. All scores are presented in the supplemental materials.

New cases per million population. To measure the prevalence of COVID-19 cases, we collected cases of COVID-19 per million population. We collected the number of new confirmed cases (7- day smoothed) based on each participants' response dates and their current country from Hasell et al. (2020)'s work. Specifically, we averaged the number of new cases per million population on the response day and 6 days before.

Covariates. Since previous research has found that age, gender, education level, national collectivism and individualism, and financial resources, were related to one's coping style (e.g., Baloch et al., 2021; Kuo, 2013; van Deurzen et al., 2015), this study collected such data and analyzed them as covariates. Additionally, we controlled for the Stringency Index, historical pathogens, the number of people in the household, and population density because they may be related to the spread and severity of COVID-19 (e.g., Wong & Li, 2020). The stringency index gauges the strictness of governmental COVID-19 policies, such as travel bans and school closures. It is controlled for because countries differ in policy strictness, as well as collectivism since it is known to influence mask-wearing behaviors (Lu et al., 2021). Historical pathogens measure a population's long-term infectious disease prevalence, which was controlled for to exclude its effects when analyzing contemporary reactions to COVID-19. These are common covariates in previous COVID research (e.g., English et al., 2022). The details about the covariates are presented in Table S1 in supplemental materials.

Results

The descriptive results are displayed in Table 1. The details about the descriptive statistics of main variables by culture are presented in Table S3 in supplemental materials. Since our

dataset consists of two levels: individual level and culture level, we examined whether this dataset is suitable for a multilevel approach. Thus, we calculated the ICC for acceptance coping score in the model which only include a random intercept. The intraclass correlation (ICC) was .07, indicating that 7% of the variation in review score was due to between-culture variation. LeBreton and Senter (2008) have suggested that ICC >.05 indicating the necessity of multilevel modeling. Therefore, we conducted multilevel analyses using the nlme package in R (Pinheiro et al., 2010). We tested a multilevel model with grand-mean centered cultural flexibility, new cases per million, and their interaction term, the society-mean-centered new cases per million, and the interaction with grand-mean centered cultural flexibility. All grand-mean centered and society-mean centered control variables are included in Table 2. Although new cases per million and stringency index are society-level variables, they were reported daily and thus varied depending on the participants' survey completion date. Therefore, they are also society-mean centered estimates. All covariates and their corresponding centered estimates were included in this regression model (refer to Table 2). We also ran a regression model for adaptive coping, please refer to Table S7 in the online supplementary materials.

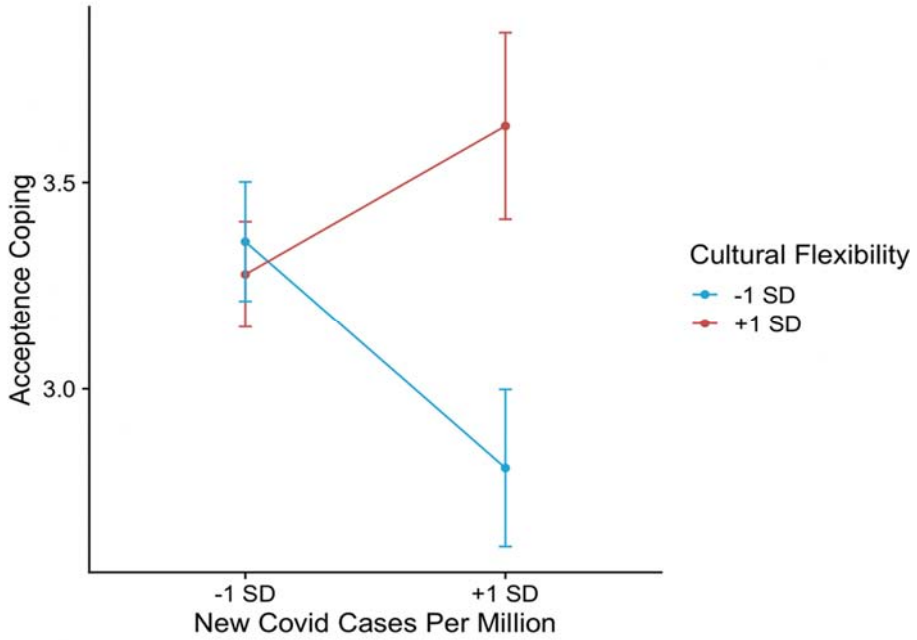

Figure 2. The interaction effect between cultural flexibility and new COVID-19 cases in model 3. Error bars represent 95% CI.

Results showed that only the interaction effect between grand-mean centered cultural flexibility and new cases was significant (see Figure 1), B = .00007, SE = .00002, 95%CI = [.00003, .0001], p < .001. This suggests that an increase in COVID-19 cases interacted with the level of cultural flexibility, affecting individuals' coping acceptance. Specifically, when cultural flexibility was higher (1SD above the mean), new cases per million was positively associated with participants' acceptance coping: B = .005, SE = .002, 95%CI = [.001, .008], p = .008 (Table 2). When cultural flexibility was lower (1SD below the mean), new cases per million was negatively associated with participants' acceptance coping: B = -.007, SE = .002, 95%CI = [-.010, -.004], p < .001. These results supported our hypothesis. We also adopted grand-mean centering and society-mean centering with or without covariates separately. The interaction effect between grand-mean centered cultural flexibility and new cases was robustly significant. These results were included in Table S4 in the supplementary materials.

Discussion

Our data from more than 7,000 people in 26 countries confirmed that cultural flexibility moderated the relationship between COVID-19 cases and acceptance coping strategies. Specifically, for cultures with high flexibility, COVID-19 cases correlated with more acceptance coping; for cultures with low flexibility, COVID-19 cases correlated with less acceptance coping. This result is consistent with previous research that stated participants from more flexible cultures have the ability to adapt to suffering, while participants from less flexible cultures have trouble living with suffering (Minkov et al., 2018).

Limitations

There are several limitations that need to be considered when interpreting the results from the current research. First, the number of countries is limited. To obtain validated results, we only included countries with at least 30 participants, some being university student samples, and there are limited cultures with flexibility scores (Minkov et al., 2018), resulting in only 26 cultures in the analysis. Future research could examine our findings in a larger sample with more cultures. Another significant limitation is our reliance on flexibility scores derived from a different study conducted in a pre-COVID context with another sample (i.e., Minkov et al., 2018). The generalization of flexibility scores from Minkov et al. (2018) to our sample poses a potential risk of bias. Future research should consider gathering firsthand data on cultural flexibility to ensure more precise and relevant interpretations. Finally, we only investigated acceptance coping strategy in the present study. Future research may profitably explore the link between cultural flexibility and other coping strategies.

Implications

This study innovatively uses the newly discussed cultural trait flexibility-monumentalism to understand how individuals cope with the prevalence of this pandemic. As a cultural trait that distinguishes East Asian from the rest of the world, flexibility can help us understand more about why East Asian countries excelled in coping with COVID-19 (Li et al., 2022). Moreover, this study linked flexibility and acceptance coping for the very first time, enriching the research of both coping strategies and flexibility-monumentalism. In addition, the findings of this study could be instrumental for practitioners who wish to promote adaptive coping strategies. Interventions can be designed to increase flexibility, thereby enhancing adaptive responses to crises. For example, training sessions and workshops can focus on inculcating cultural flexibility. Through training, participants can be made aware of the benefits of flexibility and trained to imbibe this trait.

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Table 1.

Means, Standard Deviations, and Correlations among Variables (N = 7476)

Variables	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Acceptance coping	3.28	0.69	(.74)												
2. Flexibility	4.87	83.8	.01	--											
3. New cases per million	35.9	39.33	-.03**	-.11**	--										
4. Gender	0.64	0.48	.01	.05**	.04**										
5. Age	31.86	12.97	.03**	.11**	.14**	0.4**	--								
6. Education level	4.56	1.53	.13**	.12**	-.08**	.01	.23**	--							
7. Stringency index	77.4	14.22	.01	-.40**	.16**	-.09**	.02	.12**	--						
8. Hofstede's individualism	54.32	26.12	.07**	.16**	.30**	.08**	.07**	-.13**	-.18**	--					
9. Gini	38.81	8.28	-.10**	-.66**	.04**	.02	-.08**	-.12**	.17**	-.14**	--				
10. GDP per capita (US$)	30499.13	16009.38	.09**	.38**	.32**	.08**	.12**	-.10**	-.42**	.74**	-.46**	--			
11. Pathogens per culture	0.19	2.02	-.12**	-.44**	-.23**	-.02*	-.17**	.03*	.26**	-.69**	.64**	-.78**	--		
12. Population density	160.82	142.92	.01	.48**	-.33**	.01	.01	.15**	.09**	.01	-.41**	-.12**	-.13**	--	
13. People in household	3.4	1.75	-.04**	-.14**	-.17**	-.02	-.21**	-.09**	.09**	-.13**	.23**	-.24**	.23**	.02	--

Note. Gender: 0= male, 1 = female. Education: 1 = below high school to 7 = doctoral or equivalent. Spearman correlation was used to the correlation between gender and the rest variables. The reliability was reported in the diagonal line.

* $p < .05$, ** $p < .01$.

Table 2.
Regression Model for Acceptance Coping

	B (SE)
(Intercept)	3.27^{***}(.03)
$\text{Flexibility}_{\text{grand-mean centered}}$	$.002^{**}$ (.0007)
$\text{New cases per million}_{\text{grand-mean centered}}$	-.001(.0008)
$\text{New cases per million}_{\text{society-mean centered}}$	-.0008(.0009)
$\text{Flexibility}_{\text{grand-mean centered}} \times \text{New cases per million}_{\text{grand-mean centered}}$	$.00007^{***}$(.00002)
$\text{Flexibility}_{\text{grand-mean centered}} \times \text{New cases per million}_{\text{society-mean centered}}$	-.00003(.00002)
$\text{Gender}_{\text{grand-mean centered}}$	.02(.27)
$\text{Gender}_{\text{society-mean centered}}$	.003(.27)
$\text{Age}_{\text{grand-mean centered}}$	-.004(.005)
$\text{Age}_{\text{society-mean centered}}$	-.004(.005)
$\text{Education level}_{\text{grand-mean centered}}$	$.09^{*}$(.04)
$\text{Education level}_{\text{society-mean centered}}$	-.07(.04)
$\text{Stringency index}_{\text{grand-mean centered}}$	.005(.004)
$\text{Stringency index}_{\text{society-mean centered}}$	-.004(.004)
$\text{Hofstede's individualism}_{\text{grand-mean centered}}$	-.002(.002)
$\text{Gini}_{\text{grand-mean centered}}$	.01(.008)
$\text{GDP per capita}_{\text{grand-mean centered}}$	.00001(.00001)
$\text{Pathogens per culture}_{\text{grand-mean centered}}$	$-.07^{*}$(.03)
$\text{Population density}_{\text{grand-mean centered}}$	-.0003(.0002)
$\text{People in household}_{\text{grand-mean centered}}$	-.010(.005)
Conditional R^2	.08
Observations	6760
Countries	26

Note. Unstandardized regression coefficients are displayed, with standard errors in parentheses.
$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.