

A Cross-Cultural Study on the Effects of Government Control Policies on Mobility in COVID-19

Cross-Cultural Research
2024, Vol. 0(0) 1–28
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DOI: 10.1177/10693971241245878
journals.sagepub.com/home/ccr



JungWon Lee¹, OhSung Kim², and Cheol Park³ 

Abstract

This study sought to explore the impact of government policies aimed at reducing the spread of COVID-19, such as social distancing and quarantine, on the reduction in the mobility of people and the role of national culture in moderating this effect. To test this hypothesis, this study collected 21,150 sets of data from 57 countries worldwide and analyzed them using a multilevel growth model. In addition, the number of COVID-19-infected people, the number of people vaccinated, number of days since the first COVID-19, median age by country, population density, total population, and GDP per capita, which can affect mobility, were added as control variables in the study model. Notably, the results of our analysis revealed that the stringency of government policies had a negative effect on mobility and that this effect differed according to cultural characteristics. The findings of the current study have the following implications. First, differences between countries were

¹Post-Doc Researcher, Basic Science Research Institution, Chungbuk National University, Cheongju, South Korea

²Collaboration Professor, Industry-University Cooperation Foundation, Chungbuk National University Chungbuk Pro Makercenter, Cheongju, South Korea

³Professor, College of Global Business, Korea University, Sejong, South Korea

Received: 25 July 2023; accepted: 21 March 2024

Corresponding Author:

Cheol Park, College of Global Business, Korea University, 2511 Sejong-ro, Sejong 30019, South Korea.

Email: cpark@korea.ac.kr

explained by exploring the effectiveness of government policies in preventing the increase in infectious diseases based on a cultural perspective. Second, the results of this study provide policy implications that international policy makers can refer to apart from the context of the COVID-19 epidemic by presenting country-specific differences in government policies.

Keywords

COVID-19, stringency index, mobility, culture, multilevel growth model, Hofstede

Introduction

The COVID-19 pandemic has been recognized as one of the phenomena that have fundamentally changed our way of life. To prevent the spread of COVID-19, the government had implemented certain policy measures, such as closing nonessential businesses (e.g., schools and workplaces), restricting public transportation and gatherings, restricting travel, and isolating people at home. In addition, vaccination has recently been recommended in hopes of returning to pre-pandemic levels of infection. However, the effectiveness of these global efforts to curb the growth of COVID-19 varies widely from country to country. For example, Italy, France, Sweden, and the United States have seen alarming increases in the number of COVID-19 cases over time, whereas Singapore, South Korea, and Taiwan have experienced lower rates of increase.

In other words, while government policies may help contain or prevent COVID-19, the actual effectiveness of these policies is likely determined by sociocultural factors. Indeed, transmission of infectious diseases within a society is linked to culture, which influences individual behavior and decision-making. A recent study pointed out that the pattern of increase in COVID-19 is associated with culture (Dheer et al., 2021). In addition, another recent study (Huynh, 2020a) suggested that participation in social distancing and self-isolation differs across cultures. Cross-cultural and social psychology literature indicate that mental representations that shape one's evaluation, judgment, and response to external events are based primarily on culturally derived knowledge (Peterson and Smith, 2008). Culture offers the lens through which individuals see the world, and it shapes the schema that guides their behavior (Sully De Luque et al., 2000). In this context, understanding the role of culture in moderating the effectiveness of government policies aiming to prevent the spread of infectious diseases can have policy implications. However, the role of culture in preventing the spread of infectious diseases worldwide has not been sufficiently studied (Wolf et al., 2020).

We reviewed the cultural differences literature on the effectiveness of government policies and found the following gaps: First, although a few studies have analyzed the role of the cultural dimension in moderating the relationship between government policy and COVID-19 case growth rate (Dheer et al., 2021), the relationship with mobility, which can measure the direct response to government policy, has not been sufficiently explored in cultural context. We believe that the mobility index is suitable for this study given its negative correlation with COVID-19 incidence rates and social contact (Prem et al., 2020).

Second, previous research is limited in terms of control variables and period. Most studies explored the period of the first wave (e.g., Huynh, 2020b), and studies exploring the subsequent period are limited. In addition, most previous studies did not control important factors such as the number of vaccinated people, media freedom, and trust in government policies.

Third, previous studies failed to consider all six cultural dimensions of Hofstede's cultural value framework. For example, Frey et al. (2020) examine the impact of individualism Huynh (2020a) tested the effects of 'individualism', 'uncertainty avoidance', and 'power distance' on social distancing.

In this context, this study seeks to explore the impact of government policies aiming to prevent the spread of COVID-19, such as social distancing and quarantine, on the reduction in the mobility of people and the role of national culture in moderating this effect. To test this hypothesis, this study collected 21,150 sets of data from 57 countries worldwide and analyzed them using a multilevel growth model. In addition, the number of COVID-19-infected people, the number of people vaccinated, number of days since the first COVID-19, median age by country, population density, total population, stringency speed, media freedom, trust in government policy and GDP per capita, which can affect mobility, were added as control variables in the study model. Notably, the results of our analysis revealed that the stringency of government policies had a negative effect on mobility and that this effect differed according to cultural characteristics.

The findings of the current study have the following implications. First, differences between countries were explained by exploring the effectiveness of government policies in preventing the increase in infectious diseases based on a cultural perspective (Kazak, 2020). Second, the results of this study provide policy implications that international policy makers can refer to apart from the context of the COVID-19 epidemic by presenting country-specific differences in government policies across 90 countries.

Theoretical Background and Hypotheses

COVID-19 Spread and Government Action

Infectious diseases like COVID-19 spread based on individual behavior. From this perspective, government policies aiming to prevent the spread of

infectious diseases (e.g., distancing and vaccination) require strong incentives to change individual behavior (Del Valle et al., 2013). However, inducing rapid behavioral changes in the early stages of an epidemic is considerably difficult, hence the need for implementing various government policies to induce these changes (Anderson et al., 2020). Previous studies suggest two aspects of government policy. The first aspect involves the implementation of nonphysical measures to inform the public regarding the gravity of the epidemic and correct behavior through various media channels (Lee & Basnyat, 2013). The second involves the implementation physical measures, such as closing schools, workplaces, and nonessential businesses; limiting public transportation and gatherings; restricting travel; and issuing shelter-in-place orders. These government policies can yield indicators of severity based on the number of physical measures implemented. Strict government policies and media exposure on their seriousness may signal to the public that infectious diseases, such as COVID-19, pose serious health and economic threats, prompting action to prevent spread, such as vaccination (Hsiang et al., 2020).

Indeed, after COVID-19 had been declared a pandemic, governments worldwide implemented various measures, including social distancing and vaccination (Fong et al., 2020). These government actions have proven to be effective against several epidemics, such as the 1918 Spanish flu and the 2009 flu outbreak in Mexico City. For instance, social distancing measures will force the closure of businesses, schools, and community centers and the banning of large gatherings and private travel. These measures aim to slow the exponential increase in infection rates and reduce the pressure on health care resources (Brodeur et al., 2021). Countries with strict social distancing measures are characterized by high rates of elderly residents and high population densities, as well as being democratic and having high rates of travel (Brodeur et al., 2021).

Researchers have reported that government policies are effective in preventing the spread of COVID-19. For example, Fang et al. (2020) argued that infection rates in cities other than Wuhan would have been 65% higher if containment had not been implemented therein. Regarding the effect of social distancing, Greenstone and Nigam (2020) estimated that 1.7 million less COVID-19 cases would have emerged in the United States had compliance with distancing regulations been maintained for 3–4 months. Similarly, Dave et al. (2020) found that in Texas, where stay-at-home orders were quickly implemented in the United States, the rate of increase in COVID-19 cases decreased by 19%–26% 2 weeks after the order was implemented. As a result of this global analysis, Hsiang et al. (2020) reported that social distancing measures prevented or delayed around 62 million cases of COVID-19.

However, these government policies can be perceived differently according to social contexts, such as political and economic situations. According to previous studies, government policy decisions are linked to party

characteristics or political beliefs (Baccini et al., 2021). e.g., Allcott et al. (2020) stated that the risk of contracting COVID-19 is perceived differently according to political beliefs; hence, people may have different views on government policies depending on their political beliefs.

Responding to Government Actions

The effectiveness of government policies aiming to prevent the spread of COVID-19 depends on the level of public acceptance (e.g., Coelho et al., 2020). According to previous studies, compliance behavior differs according to socioeconomic factors, such as gender, income level, and ethnic diversity. For instance, Galasso et al. (2020) reported that women are more likely than men to comply with policy measures based on survey data from eight OECD countries. Additionally, Chiou and Tucker (2020) found that Americans living in high-income areas with high-speed internet access were relatively more likely to adhere to social distancing guidelines. Similarly, Gupta (2020) reported that residents in low-income neighborhoods throughout New York City were less likely to adhere to home isolation outside of working hours. This is because low-income individuals frequently visit retail stores to purchase necessities and are highly unlikely to benefit from flexible working arrangements, such as remote work (Brodeur et al., 2021). Consistent with this, Bonaccorsi et al. (2020) found that economically wealthy cities in Italy showed a greater decline in mobility.

The level of social trust has also been reported as an important factor in determining government policy acceptance. For example, Bargain and Aminjonov (2020) reported that relatively nonessential mobility was reduced in Europe with a high level of confidence. Brodeur et al. (2021) also found that cities with high trust in the United States were more likely to accept the containment policy. Similarly, Barrios et al. (2021) revealed that areas with a strong civic culture voluntarily engaged in social distancing. Taken together, the aforementioned findings show that COVID-19 rates tend to decrease when social capital is high (Bartscher et al., 2021).

However, even after accounting for these sociocultural factors, the effectiveness of these global measures in restraining the growth of the pandemic varies widely across countries (e.g., Dheer et al., 2021). For example, Italy, France, Sweden, and the United States have seen alarming increases in the number of cases of COVID-19 over time, whereas such an increase in cases has been low in Singapore, South Korea, and Taiwan. A recent study pointed out that the pattern of increase in COVID-19 is related to culture. Recent studies (e.g., Dheer et al., 2021; Huynh, 2020b) suggest that participation in social distancing and self-isolation measures may vary across cultures. e.g., He et al. (2022) reported that individualism and egalitarianism had a positive effect on covid 19 prevalence, while cultural heterogeneity was associated

with a stronger public health response. Additionally, [Bargain and Aminjonov \(2020\)](#) reported results showing that high-trust areas reduce mobility related to unnecessary activities much more than low-trust areas.

Although previous studies, such as that by [Dheer et al. \(2021\)](#), have explored how the sternness of government policies affects the spread of COVID-19 according to culture, studies on mobility related to direct acceptance of government policies have been limited. e.g., [Rieger and Wang \(2020\)](#) analyzed mobility patterns by country using mobility data from Apple and Google but did not explore cultural differences in depth. Previous studies had failed to account for various other factors could have affected the number of infected people analyzed as a dependent variable while also failing to control for the effects of the COVID-19 vaccine. Moreover, previous studies failed to consider all six cultural dimensions of Hofstede's cultural value framework. Therefore, this study seeks to explore how the impact of government policies on reduced mobility differs according to the six cultural dimensions.

Cultural Comparison

Research has investigated how political institutions affected the speed and aggressiveness of countries' pandemic responses (e.g., [Frey et al., 2020](#)). However, we contend that policy decisions and societal compliance will reflect not only countries' formal political environments, but also a broader set of factors that shape worldviews, including informal institutions and cultural values. Culture provides a perspective from which individuals view and act on the world ([Sully De Luque et al., 2000](#)), and the effectiveness of government policies and guidelines is influenced by culture ([Graafland & Noorderhaven, 2020](#)). The effectiveness of government policies aiming to prevent the spread of COVID-19 is highly likely to differ depending on culture. The current study hypothesizes that culture could explain the differences in the effects of government policies on COVID-19 between countries. Thus, we seek to explore cultural differences between countries using [Hofstede's \(2013\)](#) cultural values framework.

Hofstede's cultural values framework is divided into six dimensions. First, power distance is the degree to which members with less power in an organization or group accept and expect an unequal distribution of power ([Hofstede, 2013](#)). Thus, people in societies with a high-power distance accept hierarchical structures without justification. On the other hand, cultures with a low power distance strive for equality or require justification for inequality.

Second, individualism/collectivism refers to the degree to which individuals are integrated into groups. Western and Eastern countries are regarded as representative individualistic cultures and collectivist cultures, respectively. People in individualistic cultures prefer to act as individuals rather than

members of a group (Steenkamp et al., 1999), value self-awareness and self-actualization (de Mooij & Hofstede, 2010), and value work over interpersonal relationships. Such people prioritize personal time while maintaining a clear separation between work time and personal time. Collectivist cultures are tight-knit social structures in which people expect groups to help them in return for unwavering allegiance (Steenkamp et al., 1999). Therefore, in a collectivist culture, it is important not to lose face from a collective point of view (de Mooij & Hofstede, 2010).

Third, masculinity/femininity refers to the degree to which emotional roles differ according to gender. Masculine cultures value things like competitiveness, assertiveness, materialism, ambition, and power, where feminine cultures highly value interpersonal relationships and quality of life (Hofstede, 2013). Hofstede et al. (2013) expressed masculinity as strong assertiveness and femininity as nurturing. Masculine societies value achievement and view success based on status. Therefore, it is considered important to show off brands that can demonstrate performance and achievement, such as jewelry or status brands (De Mooij, 2010). On the other hand, a feminist society values quality of life more than victory in competition and does not measure success based on status. Such societies have little role discrimination, are people-oriented, and place efforts into majority consensus.

Fourth, the uncertainty avoidance index is defined as the degree to which individuals feel uncomfortable in unstructured and uncertain situations (Hofstede, 2013). Eastern countries have higher uncertainty avoidance than Western countries (Hofstede, 2013). Low-certainty cultures, such as the West, are characterized by relaxed atmospheres in which deviation is more readily tolerated. In contrast, strong uncertainty avoidance cultures maintain strict beliefs and behavioral norms and are negative toward deviant people and ideas. Thus, cultures with high uncertainty avoidance, such as the East, are relatively less open to change, deviation, and innovation (de Mooij & Hofstede, 2010).

Fifth, there is a difference between cultures with a long- and short-term orientation. Long-term orientation refers to the extent to which individuals accept delayed satisfaction of material, social, and emotional needs (Hofstede, 2013). The East has a long-term-oriented culture and has characteristics such as patience, order according to social status, and frugality (de Mooij & Hofstede, 2010). On the other hand, the West has a short-term oriented culture characterized by respect for individual safety traditions.

Sixth, indulgence stands for the tendency to allow relatively free gratification of basic and natural human desires related to enjoying life and having fun (Hofstede et al., 2013, p.281). People in indulgence cultures tend to be more contented, optimistic, and outgoing. They enjoy leisurely activities, value friendships, and communicate more closely with foreigners as well as family, friends, and colleagues (Hofstede et al. 2013, p. 297).

This cultural dimension of Hofstede's Theory has been proven effective in various fields, such as personnel management, leadership, and decision-making, at individual, group/organizational, and national levels (Kirkman et al., 2006). Therefore, the current study seeks to explore the role of culture in regulating the effects of government policy stringency on mobility based on Hofstede's six cultural dimensions.

Research Hypotheses

This study seeks to explore the role of Hofstede's six cultural dimensions in modulating the effect of government policy stringency indicators on mobility. The strictness index is composed of nine containment policies, including school closure, staying at home, and travel restrictions. Based on this index, the strength of the government's COVID-19 prevention policy can be measured. The severity index is a representative indicator of government policies aimed at limiting the spread of COVID-19 (e.g., Dheer et al., 2021; Lipić et al., 2022). Therefore, the basic hypothesis of current study is that government policy strictness affects mobility, based on which we analyze whether differences in effects exist according to culture.

The stringency of government policies can negatively impact mobility. According to previous studies, strict government policies and media exposure to seriousness can decrease mobility to prevent the spread of infection by implying to the public that infectious diseases, such as COVID-19, pose serious health and economic threats (Hsiang et al., 2020). For example, a study by Greenstone and Nigam (2020) in the United States estimated that 1.7 million less cases of COVID-19 would have emerged had distancing compliance been maintained for 3–4 months. Similarly, Dave et al. (2020) found that in Texas, where stay-at-home orders were quickly implemented, the rate of increase in COVID-19 cases decreased by 19%–26% 2 weeks after the order was implemented. As such, the stringency of various government social distancing and quarantine policies can have a negative impact on mobility.

Hypothesis 1. The stringency of government policies would have a negative effect on mobility.

The effectiveness of government policies and guidelines is influenced by culture (Graafland & Noorderhaven, 2020). Based on these basic assumptions, the moderating effect of cultural is discussed as follows.

First, given that countries with a high-power distance are more open to following national guidelines, higher stringency indices may enhance their effectiveness (Fischer & Mansell, 2009). On the other hand, stricter government policies may have undesired effects in cultures with a small power distance by strengthening the psychological repulsion given that the relationship between the

government and the public is equal. Resnicow et al. (2021) reported that innate resistance (trait reactance) reduces COVID-19 preventive behavior based on the psychological resistance theory (Brehm & Brehm, 1981). According to the theory of psychological resistance, people feel that their freedom is threatened when they are forced to do certain things. Moreover, they tend to recover the perceived loss of freedom by rejecting the coerced action, even if it is valid (Brehm & Brehm, 1981). This backlash may occur in countries with a low power distance, which view the relationship between the state and individuals as equal. On the other hand, cultures with a high-power distance may be more accepting of strict government policies given that they accept hierarchical structures (Hofstede, 2013).

Hypothesis 2. The negative effects of government policy stringency on mobility would intensify as power distance increases.

Second, high collectivism enhances the effectiveness of government policies, similar to power distance. Given that collectivist cultures prioritize the interests of the group over individual liberty, they are highly likely to accept stricter government policies (Hofstede, 2013). A study by Inglehart and Oyserman (2004) found that because collectivist states emphasize duty, obedience, and utilitarian consequences, they may follow social norms considered desirable, such as social distancing, at the expense of individual freedom. In individualistic cultures, however, even a slight increase in the stringency of government policy may cause resentment for the need to sacrifice culturally important personal freedoms. Thus, the positive effect of government policy on mobility would be weakened.

Hypothesis 3. The negative effect of government policy stringency on mobility would be weakened as individualism increases.

Third, strongly masculine countries tend to pursue self-assertion, achievement, and success, whereas strongly feminine countries prioritize values such as service, welfare, and care for others. Hence, infection prevention and control may be more effective in countries with feminine cultures than in masculine countries given the former's concern for the welfare of others (Borg, 2022); nonetheless, masculinity could also potentially have a positive effect on compliance with government policies. Given that strongly masculine countries emphasize competitiveness, toughness, and achievement orientation (Hofstede, 2013), they may comply with strong government policies to achieve the goal of reducing the spread of COVID-19. Accordingly, Dheer et al. (2021) proposed that masculine societies would have a higher COVID-19 case growth though, surprisingly, found the opposite relationship. A characteristic of masculine societies is their preference for assertive behavior and directive leadership. Therefore, leaders in masculine societies may view timely, stringent policies as a more socially acceptable response. Therefore, voluntary actions to

prevent COVID-19 can be strengthened in strongly feminine countries, whereas compliance with strict government policies can be strengthened in countries with achievement-oriented masculine cultures.

Hypothesis 4. The negative effect of government policy stringency on mobility would be strengthened as masculinity increases.

Fourth, countries with greater uncertainty avoidance are more likely to accept strict government policies, such as social distancing, to avoid the risk of COVID-19. Hofstede (2013) defined a country with high uncertainty avoidance as a rigid country that does not tolerate deviations from individual social norms. In other words, greater uncertainty avoidance is associated with a higher possibility of accepting and following government policies and social norms to prevent the spread of COVID-19, regardless of the level of strictness.

Hypothesis 5. The negative effect of government policy stringency on mobility would be strengthened as the propensity for uncertainty avoidance increases.

Fifth, long-term-oriented cultures possess certain characteristics such as patience, order according to social status, and frugality (de Mooij & Hofstede, 2010). Also, long-term-oriented cultures are more likely to conform to government policies by prioritizing the future instead of the present. This is because government policies aiming to prevent the spread of COVID-19, such as social distancing and quarantine, focus on preventing future risks regardless of the accompanying current inconveniences, lack of freedom, and economic loss. In other words, orderliness, which is a characteristic of long-term-oriented cultures, may have a positive effect on the acceptance of distancing policies, such as quarantine and reduction of mobility.

Hypothesis 6. The negative effects of government policy stringency on mobility would be strengthened as long-term orientation increases.

Sixth, people in indulgence cultures tend to be more satisfied, optimistic, and extroverted. Stringency in government policies can encourage people to take action to prevent infection, such as social distancing, by hinting at health and economic risks (Hsiang et al., 2020). However, people in an indulgence culture are optimistic about the risk of COVID-19 and may therefore have relatively low levels of government policy acceptance. In addition, people in an indulgence culture enjoy leisurely activities, value friendship, and communicate more closely with not only family, friends, and colleagues but also foreigners (Hofstede et al. 2013, p. 297). These characteristics negatively impact mobility reduction policies. On the other hand, people in restraint cultures tend to restrain their desires for a purpose and are more likely to accept strict government policies.

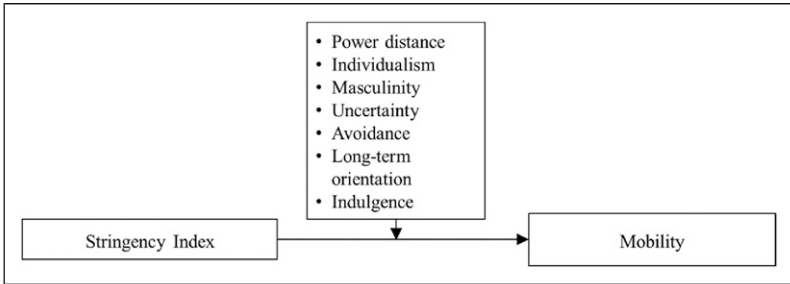


Figure 1. Research model.

Hypothesis 7. The negative effects of government policy stringency on mobility would weaken as the culture of indulgence increases.

A summary of the hypotheses discussed so far is shown in [Figure 1](#). The severity index for the spread of COVID-19 affects mobility, and this effect is modulated by culture.

Research Methods

Data

This study used two datasets. Mobility data, which is the dependent variable, utilizes mobility data provided by Google. According to [Rieger and Wang \(2020\)](#), Apple Maps data provides high-quality data about planned trips, while Google data provides high-quality location data. Therefore, it can be said that it is appropriate to use Google data to analyze country-specific differences in people's behavior changes according to the stringency index. Google Mobility Data were obtained from Google's COVID-19 Community Mobility Report. The purpose of the Community Mobility Report is to provide information on changes under the COVID-19 prevention policy. In the report, movement trends by time and region are provided for six categories of places: "Retail and leisure facilities," "grocery stores and pharmacies," "parks," "public transit stations," "workplaces," and "residences." In this study, changes in mobility according to country were measured by summing up the mobility trends for the six categories of places. In addition, COVID-19 data (e.g., number of new infections) and country characteristics (e.g., median age, population density) for up to 2 years after the first COVID-19 outbreak were collected from "Our World in Data."

These data show the number of COVID-19 cases and related information provided by the European Center for Disease Control and Prevention on a daily basis, as well as information on each country code and continent.

Dependent and independent variables were measured as follows. First, mobility data, the dependent variable, was calculated by adding the six dimensions of mobility data provided by Google. Second, the stringency index, the independent variable, is a comprehensive measurement index based on nine government policy indicators, including school closures, workplace closures, and travel bans. This index has a value that ranges from zero to 100, with 100 being the most stringent response.

Through a review of prior research, we controlled for country factors that could affect mobility and strict government measures. First, given that the number of vaccinated persons is a factor that affects the movement of citizens, the number of new vaccinated persons per day in each country was measured and controlled (Borga et al., 2022). Second, given that the number of new confirmed cases is an indicator that reflects the severity of COVID-19, the number of new confirmed cases per 1 million population was measured and controlled (Dheer et al., 2021). Third, the elapsed days after the COVID-19 outbreak (2020-01-30)¹ were measured to control the effect over time (Dheer et al., 2021). Fourth, given that COVID-19 is more lethal to older people, the median age by country was measured and controlled. Fifth, given that population density is a factor that directly affects mobility, it was calculated by dividing the number of people in each country by the land area measured in square kilometers and controlled for. Sixth, given that population number is a factor that affects density, it was controlled for by measuring the number of people in each country. Finally, to control for the economic environment, GDP per capita was measured in 2011 international US dollars. In addition, the natural logarithm was applied to population number, and GDP per capita, in which the skewness has a positive value. Seventh, according to Chen et al. (2021), governments in collectivist countries were analyzed to implement COVID-19 response policies more quickly. Therefore, the value of stringency speed for each country provided by Chen et al. (2021) was controlled. Eighth, according to previous research, media freedom was analyzed to affect trust in government policies. Additionally, trust in government policy needs to be controlled as a factor affecting the relationship between stringency index and mobility. Therefore, trust in government policies on COVID-19 provided by Fetzer et al. (2020) was measured and controlled, and media freedom was controlled using the World Press Freedom Index.

Data used in this study were classified in the following order. First, the total data collected accounted for 768 days and included a total of 238 countries. A total of 160,009 sets of data were identified, excluding country-days for which data were not measured for each country. Given the need to classify country-day data for variables (e.g., number of new vaccine recipients) to be used in this study, 57 countries were selected and a total of 21,150 sets of data were classified.

Prior to the analysis, the severity index and mobility over time were analyzed graphically as showed by Figures 2 and 3. Give that the severity

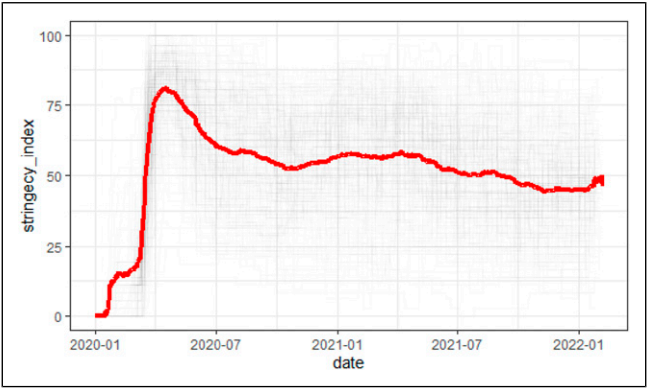


Figure 2. Change in the stringency index over time.

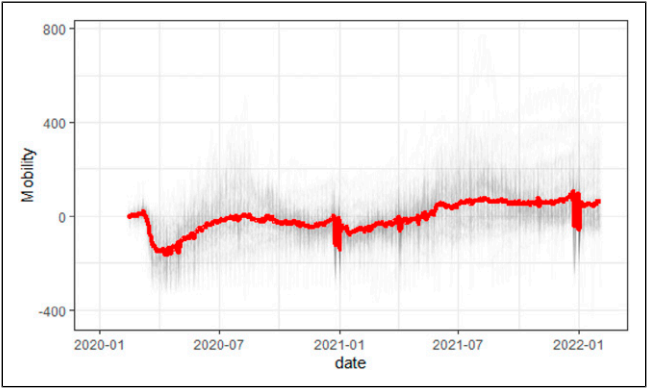


Figure 3. Change in mobility over time.

index increased sharply at the beginning of the COVID-19 outbreak and then gradually decreased, the overall mobility tended to increase over time. Through multilevel growth model analysis, we analyzed the in-depth relationship between the two indicators according to each country’s culture.

Analysis Method

The hypotheses established in this study were tested using a multilevel growth model (Raudenbush & Bryk, 2002; Singer & Willett, 2003) that considers the characteristics of the data. Because traditional multiple regression techniques treat the unit of analysis as an independent observation, the standard error of the regression coefficient is underestimated, and statistical significance is overestimated. Multilevel growth model is the appropriate analytic approach

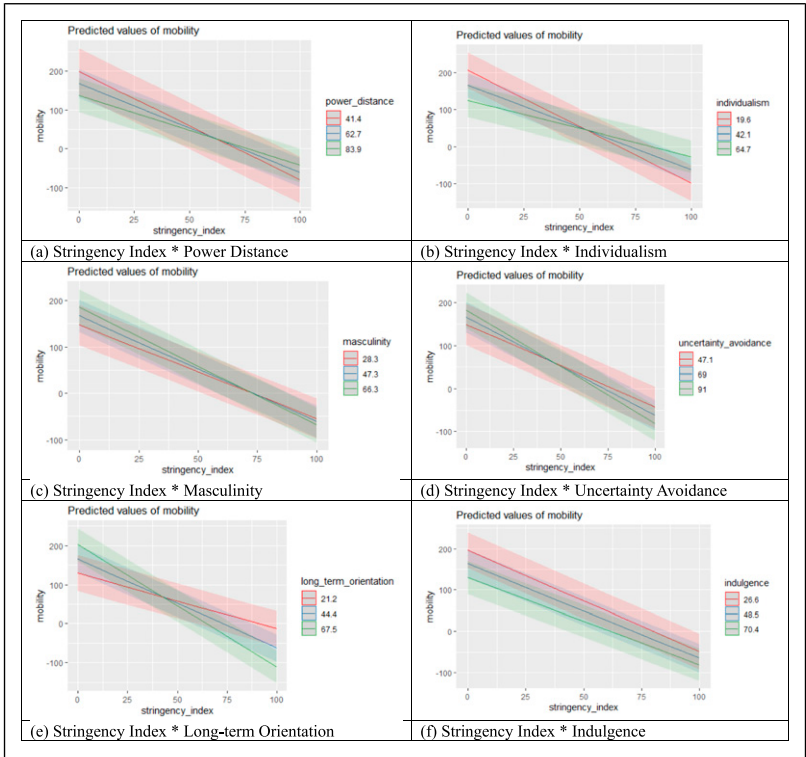


Figure 4. Results of the marginal effect analysis.

for multi-level longitudinal data, insofar as it addresses issues of unmeasured heterogeneity across units (i.e., countries) and unbalanced data (e.g., missing daily mobility data for countries) (Dheer et al., 2021).

In this study, elapsed days, the number of daily infections, and independent variables were included in level 1, and culture and national characteristics, and control variables were included in level 2. The basic statistics of the variables and the results of the correlation analysis are shown in Table 1.

Analysis Results

The results of our analysis are shown in Table 2 below. Notably, model (1), showed that the severity index had a negative effect on mobility ($\beta = -2.048$; $p < .01$), supporting hypothesis 1. Next, model (3) was analyzed to verify our hypothesis on the moderating effects of cultural dimension. First, power distance was found to weaken the negative effects of the severity index on mobility ($\beta = 0.023$; $p < .01$), rejecting hypothesis 2. Second, individualism

Table 1. Basic Statistics and Correlation Analysis.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Mobility	1																	
2. Stringency index	-.346**	1																
3. Power distance	-.001	.044**	1															
4. Individualism	.032**	-.001	-.742**	1														
5. Masculinity	-.034**	.189**	.041**	.077**	1													
6. Uncertainty avoidance	-.005	-.006	.283**	-.209**	.161**	1												
7. Long-term orientation	-.104**	-.009	-.135**	.323**	.043**	.098**	1											
8. Indulgence	-.043**	.011	-.283**	.098**	-.025**	-.280**	-.403**	1										
9. Number of confirmed cases	-.151**	.156**	.045**	.099**	.066**	-.002	.099**	-.069**	1									
10. Number of inoculations	-.003	.090**	.117**	.007	.118**	-.132**	.076**	-.118**	.340**	1								
11. Elapsed date	.333**	-.407**	.051**	-.051**	.020**	-.002	-.048**	.013	.103**	.137**	1							
12. Median age	-.121**	-.008	-.511**	.558**	-.014*	.177**	.637**	-.193**	.027**	-.103**	-.075**	1						
13. Population density	-.052**	-.026**	.086**	-.125**	.041**	-.410**	.191**	-.055**	-.028**	.003	-.010	.090**	1					
14. Population	-.054**	.118**	.187**	-.039**	.127**	-.175**	.046**	-.143**	.429**	.821**	.007	-.207**	.005	1				
15. GDP per capita	-.070**	-.046**	-.642**	.628**	-.020**	-.302**	.401**	.180**	-.056**	-.164**	-.059**	.610**	.372**	-.244**	1			
16. Trust	-.069**	.015*	-.632**	.441**	-.275**	-.341**	.152**	.035**	-.052**	-.068**	-.057**	.344**	.170**	-.104**	.574**	1		
17. Freedom	.014*	-.092**	-.714**	.664**	-.265**	-.017*	.157**	.265**	-.079**	-.201**	-.097**	.546**	-.248**	-.276**	.543**	.498**	1	
18. Stringency_Speed	-.111**	.084**	-.003	.227**	-.003	-.291**	.214**	-.076**	.034**	.056**	.005	.178**	.520**	.047**	.190**	.031**	-.137**	1
Mean	22.37	56.13	62.69	42.13	47.33	69.05	44.37	48.47	8007.53	228.093	515.97	36.17	286.54	70,471,480	27,891	3.14	69.65	.32
SD	96.100	16.17	21.247	22.58	19.00	21.97	23.13	21.89	24,249	704,692	109.71	8.70	1069.30	188,763,516	20,386	.85	15.21	.19

* $p < .05$; ** $p < .01$.

was found to weaken the negative effects of the severity index on mobility ($\beta = 0.034$; $p < .01$), supporting hypothesis 3. Third, masculinity was found to reinforce the negative effects of the strictness index on mobility ($\beta = -0.014$; $p < .01$), supporting hypothesis 4. Fourth, uncertainty avoidance was found to reinforce the negative effects of the severity index on mobility ($\beta = -0.016$; $p < .01$), supporting hypothesis 5. Fifth, long-term orientation was found to reinforce the negative effects of the severity index on mobility ($\beta = -0.037$; $p < .01$), supporting hypothesis 6. Sixth, hedonism was found to weaken the negative effects of the strictness index on mobility ($\beta = 0.008$; $p < .01$), supporting hypothesis 6.

Table 2. Results of the Multilevel Growth Model Analysis.

Hypotheses	Variables	(1)		(2)		(3)	
		Est	SE	Est	SE	Est	SE
	(Intercept)	-160.900	204.100	-162.700	238.700	-160.800	252.500
H1	Stringency index	-2.048**	0.045	-2.047**	0.045	-2.283**	0.046
	Power distance			-0.015	0.833	-0.278	0.881
	Individualism			0.037	0.698	-0.117	0.739
	Masculinity			0.386	0.543	0.323	0.574
	Uncertainty avoidance			-0.116	0.603	-0.041	0.638
	Long-term orientation			-0.330	0.533	-0.275	0.564
	Indulgence			-1.176*	0.495	-1.120*	0.524
H2	Stringency index* power distance					0.023**	0.003
H3	Stringency index* individualism					0.034**	0.003
H4	Stringency index* masculinity					-0.014**	0.002
H5	Stringency index* uncertainty avoidance					-0.016**	0.002
H6	Stringency index* long-term orientation					-0.037**	0.002
H7	Stringency index* indulgence					0.008**	0.002
	Number of confirmed cases	-0.001**	0.000	-0.001**	0.000	-0.001**	0.000
	Number of inoculations	0.001**	0.000	0.001**	0.000	0.000**	0.000
	Elapsed date	0.183**	0.006	0.183**	0.006	0.184**	0.006
	Median age	-2.831	1.568	-3.854	2.183	-4.103	2.310
	Population density	0.013	0.010	0.012	0.012	0.012	0.012
	Population	9.595	7.609	8.477	7.979	10.930	8.441
	GDP per capita	1.119	17.050	13.270	20.410	12.000	21.600
	Trust	-16.620	11.860	-17.900	14.820	-14.930	15.690
	Freedom	2.798**	0.204	2.854**	0.207	2.820**	0.206
	Stringency_Speed	-40.900	59.430	-46.950	63.390	-47.040	67.080
	Random variance	Var	Std	Var	Std	Var	Std
	Nation	4027	63.46	3927	62.67	4400	66.33
	Residual	4494	67.03	4493	67.03	4360	66.03
	AIC	238,247		238,250		237,625	
	BIC	238,359		238,409		237,832	
	logLik	-119,110		-119,105		-118,787	
	Chisq. Test			Δ 8.956 (df = 6)		Δ 636.837 (df = 6)**	
	Max. VIF	3.25		5.45		5.45	
	Number of countries	57					
	Number of data	21,150					

* $p < .05$; ** $p < .01$.

Further Analysis

We performed the following additional analyses. First, contrary to expectations, Hypothesis 2 was rejected. The reason why power distance weakens the relationship between stringency index and mobility may be due to low trust in government policy and low freedom of the press. To explore this relationship, a 3-way interaction effect was analyzed. As a result of the analysis, it was found that the higher the freedom of the press and the higher the trust in government policies, the stronger the relationship between the stringency index and mobility (See Table 3).

Table 3. Additional Analysis Results on Power Distance Cultural Dimension.

Variables	(1)		(2)		(3)	
	Est	SE	Est	SE	Est	SE
(Intercept)	−160.800	252.500	−150.800	246.900	−163.800	250.800
Stringency index	−2.283**	0.046	−2.601**	0.074	−2.489**	0.062
Power distance	−0.278	0.881	−0.314	0.862	−0.270	0.876
Individualism	−0.117	0.739	−0.177	0.722	−0.182	0.734
Masculinity	0.323	0.574	0.298	0.561	0.323	0.570
Uncertainty avoidance	−0.041	0.638	−0.038	0.624	−0.048	0.634
Long-term orientation	−0.275	0.564	−0.242	0.551	−0.226	0.560
Indulgence	−1.120*	0.524	−1.088*	0.512	−1.122*	0.520
Stringency index* power distance	0.023**	0.003	0.034*	0.004	0.027**	0.003
Stringency index* individualism	0.034**	0.003	0.036**	0.003	0.037**	0.003
Stringency index* masculinity	−0.014**	0.002	−0.012**	0.002	−0.013**	0.002
Stringency index* uncertainty avoidance	−0.016**	0.002	−0.008**	0.003	−0.012**	0.002
Stringency index* long-term orientation	−0.037**	0.002	−0.040**	0.002	−0.038**	0.002
Stringency index* indulgence	0.008**	0.002	0.005**	0.002	0.005**	0.002
Stringency index *Power distance *Freedom			−0.001**	0.000		
Stringency index *Power distance *Trust					−0.011**	0.003
Number of confirmed cases	−0.001**	0.000	−0.001**	0.000	−0.001**	0.000
Number of inoculations	0.000**	0.000	0.001**	0.000	0.001**	0.000
Elapsed date	0.184**	0.006	0.183**	0.006	0.184**	0.006
Median age	−4.103	2.310	−3.764	2.259	−3.991	2.295
Population density	0.012	0.012	0.012	0.012	0.011	0.012
Population	10.930	8.441	11.640	8.253	11.360	8.386
GDP per capita	12.000	21.600	10.650	21.120	12.090	21.460
Trust	−14.930	15.690	−14.300	15.330	−14.320	15.580
Freedom	2.820**	0.206	2.788**	0.206	2.835**	0.206
Stringency_Speed	−47.040	67.080	−47.900	65.570	−46.990	66.630
Random variance	Var	Std	Var	Std	Var	Std
Nation	4400	66.33	4203	64.83	4341	65.89
Residual	4360	66.03	4356	66.00	4357	66.01
AIC	237,625		237,605		237,612	
BIC	237,832		237,820		237,827	
logLik	−118,787		−118,775		−118,779	
Chisq. Test			Δ 22.431 (df = 1)**		Δ 14.988 (df = 1)**	
Max. VIF	5.45		8.54		5.45	
Number of countries	57					
Number of data	21,150					

*p < .05; **p < .01.

Second, Hypothesis 6 is related to temporal preference. To robustly analyze the moderating effect that temporal preference has on the relationship between stringency index and mobility, we used [Rieger et al.'s \(2021\)](#) UP TIME data to analyze whether the same results were obtained. As a result of the analysis, results consistent with the long-term oriented cultural dimension were derived (See [Table 4](#)).

Marginal Effect Analysis

As a result of analyzing the marginal effect, it was analyzed that the negative effect of the severity index on mobility was adjusted according to the cultural dimension, consistent with most of the analysis results ([Figure 4](#)).

Discussion

This study explored, from a cultural standpoint, why government policies aiming to prevent COVID-19, which have recently been implemented worldwide, had different effects on mobility according to country. Although stringency in government policies helps curb the spread of COVID-19, their effectiveness varied across different countries ([Dheer et al., 2021](#)). The results of the current study revealed that the severity index of the government policy was effective in reducing mobility and that this effect differed according to cultural characteristics. Most of the hypotheses were supported, except for hypothesis 2.

First, the stringency of government policies was analyzed to have a negative impact on mobility. Previous studies have generally reported that the stringency of government policies has a negative impact on the spread of COVID-19 (e.g., [Damette & Huynh, 2023](#); [Ma et al., 2024](#)), but some studies have reported that the effect is not sufficient (e.g., [Huynh, 2022](#)). This study analyzed data from multiple countries over a two-year period to verify the policy effect that strict government policies have a negative impact on mobility.

Second, the impact of government policy stringency on mobility varies depending on the national cultural dimension. Our results are mostly consistent with the results of the few studies that reported the moderating effect of the cultural dimension (e.g., [Dheer et al., 2021](#)). However, notably, we found that power distance reduces the effect of government policy stringency. One direction in which these results can be interpreted lies in the perceived trust in government policy ([Husted, 1999](#)). According to previous studies, power distance has a positive correlation with corruption ([Husted, 1999](#)) and a negative relationship with information transparency ([Kolstad & Wiig, 2009](#)).

Additional analysis showed that this effect disappears as media freedom and trust in government policy increase. Therefore, unlike previous studies,

Table 4. Additional Analysis Results on the Long-Term Orientation Cultural Dimension.

Variables	(1)	
	Est	SE
(Intercept)	13.870	291.800
Stringency index	−2.104**	0.048
Power distance	−0.345	0.882
Individualism	0.213	0.788
Masculinity	0.318	0.577
Up_Time	−0.067	0.714
Long-term orientation	−13.890	19.820
Indulgence	−0.902	0.525
Stringency index* power distance	0.020**	0.003
Stringency index* individualism	0.025**	0.003
Stringency index* masculinity	−0.012**	0.002
Stringency index* Up_Time	−0.032**	0.002
Stringency index* long-term orientation	−0.614**	0.078
Stringency index* indulgence	0.016**	0.002
Number of confirmed cases	−0.001**	0.000
Number of inoculations	0.001**	0.000
Elapsed date	0.175**	0.006
Median age	−3.939	2.346
Population density	0.016	0.012
Population	5.319	8.932
GDP per capita	0.400	24.960
Trust	−16.860	15.950
Freedom	2.779**	0.214
Stringency_Speed	−35.830	69.940
Random variance	Var	Std
Nation	4403	66.35
Residual	4495	67.04
AIC	231,048	
BIC	231,247	
logLik	−115,499	
Max. VIF	5.13	
Number of countries	55	
Number of data	20,509	

* $p < .05$; ** $p < .01$.

the results of this study show that the moderating effect of power distance on the effect of government policy differs depending on trust and media freedom. Therefore, in a crisis situation, countries with a higher power distance are more likely to have doubts regarding the effectiveness of government policies, which can be interpreted as having a negative impact on reducing mobility. In addition, given that most countries with a high-power distance are developing countries, they may be affected by income levels, social norms, and infrastructure. According to previous studies, when high-speed internet access is available, social distancing guidelines are followed (Chiou & Tucker, 2020). Moreover, low-income people cannot work remotely due to the nature of their jobs and frequently visit retail stores to purchase daily necessities, reducing the effects of home isolation (Gupta, 2020).

Additionally, an important point that could explain the unexpected result regarding power distance could also be that mobility restrictions are not only reflecting what the law said at that time, but also what people do beyond following the law. The law cannot regulate everything, and in countries with a low power distance people might then fill in the blanks in a more reasonable way and forego using loopholes in the regulation, while in a high power distance country they might just follow the rules and nothing more. Previous research results related to this include that high power distance discourages prosocial behaviors, such as blood donation (De Kort et al., 2010) and charitable behaviors due to lowered perceived responsibility for giving (Winterich & Zhang, 2014).

Although not presented as a hypothesis, the number of confirmed COVID-19 cases had a negative effect on mobility, and the number of vaccinated people had a positive effect on mobility. Additionally, media freedom was analyzed to have a positive effect on mobility. On the other hand, trust in government policy (Fetzer et al., 2020) and stringency speed (Chen et al., 2021), which were presented as significant variables in previous studies, were analyzed to have no significant effect on mobility.

Study Implications

This study has the following theoretical implications. First, this study contributes to existing literature related to infectious diseases, such as COVID-19. Research on measures that effectively prevent the spread of infectious diseases has considered multiple factors. In fact, previous studies have investigated socioeconomic factors that affect the effectiveness of government policies to reduce the spread of infectious disease, such as gender (Galasso et al., 2020), income level (Chiou & Tucker, 2020), and confidence level (Bargain & Aminjonov, 2020). However, the impact of government policies on mobility according to cultural dimensions has not been sufficiently analyzed (Wolf et al., 2020). The current study contributes to previous research by analyzing

cultural differences in the effects of government policies. In particular, by analyzing Hofstede's six cultural dimensions, the current findings supplement those presented in previous studies focusing on a small number of dimensions (e.g., [Dheer et al., 2021](#)).

Second, the present study contributes to cultural comparative literature. Prior research on various fields, such as business administration and psychology, has been conducted. According to a review study by [Kirkman et al. \(2006\)](#), studies investigated various fields, such as personnel management, leadership, and decision-making at the individual, group/organizational, and national levels. However, the role of culture in pandemic situations has not been sufficiently studied ([Dheer et al., 2021](#)). The current study adds new knowledge regarding the application of Hofstede's framework by finding that cultural dimension mediates the effects of government policy. In particular, the results of this study contributes to the global business literature by providing exploratory results on how consumers behave according to cultural dimensions in a pandemic situation in addition to policy effects.

The current study has the following policy implications. Policy makers need to understand how cultural values influence societal thinking, decision-making, and behavior and devise strategies tailored to the national context in order to stem the spread of a pandemic, such as COVID-19. The current study provides important policy implications for each of the six cultural dimensions established by Hofstede.

First, people in cultures with a high-power distance are relatively less likely to follow control policies. Moreover, a high-power distance culture is positively correlated with corruption ([Husted, 1999](#)), which may increase the likelihood of nonacceptance of the country's governing policies. Therefore, Additionally, as a result of further analysis, it was found that higher media freedom and trust in government policies can reduce mobility in the COVID-19 situation in countries with high power distance. Therefore, the effectiveness of the policy can be increased by establishing a policy to increase media freedom and providing scientific information on the effect of the policy. On the other hand, cultures with a low power distance are characterized by low dependence on authoritative leadership and rules. Thus, a form of counseling leadership may be more appropriate. In addition, facilitating support from the media, local governments, public service agencies, and nongovernmental organizations can build relationships with and engage citizens.

Second, people from collectivistic cultures are more likely to accept strict government policies, whereas those from individualistic cultures are more likely to reject such policies due to psychological reactance. To mitigate this backlash, countries with individualistic cultures that tend to prioritize personal interests and freedom require a communication strategy that can guarantee individual freedom, as well as policies that consider interactions between experts and citizens rather than authoritative implementation of government

policies. Additionally, in individualistic countries, where individuals perceive more stress and hardship by adopting palliative measures and adhering to strict government measures (Biddlestone et al., 2020), policy makers must support individuals' plight. In this scenario, providing incentives such as unemployment benefits, healthcare, and subsidies for necessities can alleviate negative psychological experiences and signal that practicing mitigation to support social welfare is not in vain (Dheer et al., 2021).

Third, given that people in highly masculine countries emphasize competitiveness, toughness, and achievement (Hofstede, 2013), they are more likely to comply with strong government policies to achieve the goal of reducing the spread of COVID-19. As such, certain approaches that reinforce this cultural effect can be applied to encourage people to accepting government policies by providing a sense of accomplishment. On the other hand, a feminine nation prioritizes values such as service, welfare, and caring for others. However, our findings highlight the need for policies that promote not only these values, but also achievement-oriented motivation to reduce mobility.

Fourth, countries with high uncertainty avoidance may accept strict government policies to avoid the risk of infection. To enhance the effectiveness of this culture, reducing uncertainty by increasing the credibility of government policies is necessary. Specifically, policies should be developed transparently and build trust by sharing factual and reasonable information.

Fifth, a long-term-oriented culture, which is characterized by patience, orderliness, and frugality, considers the future more important than the present. Thus, future-oriented government policies should be effective in inducing acceptance. For example, presenting the mid-to long-term outcomes of a policy, moving beyond the current situation and policy necessity, may be more effective. Additional analysis results showed that the longer the time preference, the greater the effectiveness of the policy. Therefore, policymakers need a framing strategy from a long-term perspective when developing policy messages.

Sixth, given that people from indulgent cultures tend to be optimistic and outgoing about the future, government policies may be less effective. To mitigate this cultural influence, methods for providing entertainment suitable for the situation are available. For instance, entertainment elements using non-face-to-face technology can be provided in a lockdown situation.

Research Limitations and Future Research Directions

This study has the following limitations. First, this study was conducted at the national level. Nonetheless, there can be significant cultural differences between communities and regions within a country. Therefore, future research is needed to consider cultural differences within countries. Individual-level

research needs to be conducted to deeply understand psychological mechanisms. Second, while this study included national control variables, such as population density, other potential variables can affect mobility, such as vaccine supply status and religion, were not accounted for. Therefore, future studies need to control for these factors. Third, although this study analyzed data from a wide range of countries, in-depth comparative analysis targeting a small number of countries may be more helpful in identifying specific mechanisms of national culture. In the future, there is a need to provide in-depth implications through research comparing countries with similar cultural aspects but different policy stringency.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Note

1. The World Health Organization (WHO) declared the outbreak a public health emergency of international concern (PHEIC) on 30 January 2020.

References

- Allcott, H., Boxell, L., Conway, J., Gentzkow, M., Thaler, M., & Yang, D. (2020). Polarization and public health: Partisan differences in social distancing during the coronavirus pandemic. *Journal of Public Economics*, 191, Article 104254. <https://doi.org/10.1016/j.jpubeco.2020.104254>
- Anderson, R. M., Heesterbeek, H., Klinkenberg, D., & Hollingsworth, T. D. (2020). How will country-based mitigation measures influence the course of the COVID-19 epidemic? *Lancet (London, England)*, 395(10228), 931–934. [https://doi.org/10.1016/S0140-6736\(20\)30567-5](https://doi.org/10.1016/S0140-6736(20)30567-5)
- Baccini, L., Brodeur, A., & Weymouth, S. (2021). The COVID-19 pandemic and the 2020 US presidential election. *Journal of Population Economics*, 34(2), 739–767. <https://doi.org/10.1007/s00148-020-00820-3>
- Bargain, O., & Aminjonov, U. (2020). Trust and compliance to public health policies in times of COVID-19. *Journal of Public Economics*, 192, 104316. <https://doi.org/10.1016/j.jpubeco.2020.104316>
- Barrios, J., Benmelech, E., Hochberg, Y., Sapienza, P., & Zingales, L. (2021). Civic Capital and social distancing during the COVID-19 pandemic. *Journal of Public Economics*, 193, 104310. <https://doi.org/10.1016/j.jpubeco.2020.104310>

- Bartscher, A. K., Seitz, S., Siegloch, S., Slotwinski, M., & Wehrhöfer, N. (2021). Social capital and the spread of COVID-19: Insights from European countries. *Journal of Health Economics*, 80, 102531. <https://doi.org/10.1016/j.jhealeco.2021.102531>
- Biddlestone, M., Green, R., & Douglas, K. M. (2020). Cultural orientation, power, belief in conspiracy theories, and intentions to reduce the spread of COVID-19. *British Journal of Social Psychology*, 59(3), 663–673. <https://doi.org/10.1111/bjso.12397>
- Bonaccorsi, G., Pierri, F., Cinelli, M., Flori, A., Galeazzi, A., Porcelli, F., Schmidt, A. L., Valensise, C. M., Scala, A., Quattrociocchi, W., & Pammolli, F. (2020). Economic and social consequences of human mobility restrictions under COVID-19. *Proceedings of the National Academy of Sciences of the United States of America*, 117(27), 15530–15535. <https://doi.org/10.1073/pnas.2007658117>
- Borga, L. G., Clark, A. E., D'Ambrosio, C., & Lepinteur, A. (2022). Characteristics associated with COVID-19 vaccine hesitancy. *Scientific Reports*, 12(1), 12435. <https://doi.org/10.1038/s41598-022-16572-x>
- Brehm, S. S., & Brehm, J. W. (1981). *Psychological reactance: A theory of freedom and control*. Academic.
- Brodeur, A., Grigoryeva, I., & Kattan, L. (2021). Stay-at-home orders, social distancing, and Trust. *Journal of Population Economics*, 34(4), 1321–1354. <https://doi.org/10.1007/s00148-021-00848-z>
- Chen, D., Peng, D., Rieger, M. O., & Wang, M. (2021). Institutional and cultural determinants of speed of government responses during COVID-19 pandemic. *Humanities and Social Sciences Communications*, 8(1), 171. <https://doi.org/10.1057/s41599-021-00844-4>
- Chiou, L., & Tucker, C. (2020). *Social distancing, internet access and inequality*. SSRN Electronic Journal. <https://doi.org/10.3386/w26982>
- Coelho, V. A., Bear, G. G., & Brás, P. (2020). A multilevel analysis of the importance of school climate for the trajectories of students' self-concept and self-esteem throughout the middle school transition. *Journal of Youth and Adolescence*, 49(9), 1793–1804. <https://doi.org/10.1007/s10964-020-01245-7>
- Damette, O., & Huynh, T. L. D. (2023). Face mask is an efficient tool to fight the Covid-19 pandemic and some factors increase the probability of its adoption. *Scientific Reports*, 13(1), 9218. <https://doi.org/10.1038/s41598-023-34776-7>
- Dave, D. M., Friedson, A. I., Matsuzawa, K., Sabia, J. J., & Safford, S. (2020). Black Lives matter protests. In *Social distancing, and COVID-19*. National Bureau of Economic Research.
- De Kort, W. L. A. M., Wagenmans, E., Van Dongen, A., Slotboom, Y., Hofstede, G., & Veldhuizen, I. (2010). Blood product collection and supply: A matter of money? *Vox Sanguinis*, 98(3p1), e201–e208. <https://doi.org/10.1111/j.1423-0410.2009.01297.x>
- de Mooij, M., & Hofstede, G. (2010). The hofstede model. *International Journal of Advertising*, 29(1), 85–110. <https://doi.org/10.2501/s026504870920104x>

- Dheer, R. J., Egri, C. P., & Treviño, L. J. (2021). A cross-cultural exploratory analysis of pandemic growth: The case of COVID-19. *Journal of International Business Studies*, 52(9), 1871–1892. <https://doi.org/10.1057/s41267-021-00455-w>
- Fang, H., Wang, L., & Yang, Y. (2020). Human mobility restrictions and the spread of the novel coronavirus (2019-ncov) in China. *Journal of Public Economics*, 191, 104272. <https://doi.org/10.1016/j.jpubeco.2020.104272>
- Fetzer, T., Witte, M., Hensel, L., Jachimowicz, J. M., Haushofer, J., Ivchenko, A., Caria, C., Reutskaja, E., Roth, C., Fiorin, F., Gomez, M., Kraft-Todd, G., Goetz, F., & Yoeli, E. (2020). Global behaviors and perceptions in the COVID-19 pandemic. <https://doi.org/10.31234/osf.io/3kfmh>
- Fischer, R., & Mansell, A. (2009). Commitment across cultures: A meta-analytical approach. *Journal of International Business Studies*, 40(8), 1339–1358. <https://doi.org/10.1057/jibs.2009.14>
- Fong, M. W., Gao, H., Wong, J. Y., Xiao, J., Shiu, E. Y. C., Ryu, S., & Cowling, B. J. (2020). Nonpharmaceutical measures for pandemic influenza in nonhealthcare settings—social distancing measures. *Emerging Infectious Diseases*, 26(5), 976–984. <https://doi.org/10.3201/eid2605.190995>
- Frey, C. B., Chen, C., & Presidente, G. (2020). Democracy, culture, and contagion: Political regimes and countries responsiveness to Covid-19. Available online: https://www.oxfordmartin.ox.ac.uk/downloads/academic/Democracy-Culture-and-Contagion_May13.pdf (accessed on 24 May 2023)
- Galasso, V., Pons, V., Profeta, P., Becher, M., Brouard, S., & Foucault, M. (2020). Gender differences in COVID-19 related attitudes and behavior: Evidence from a panel survey in eight OECD countries. <https://doi.org/10.3386/w27359>
- Graafland, J., & Noorderhaven, N. (2020). Culture and institutions: How economic freedom and long-term orientation interactively influence corporate social responsibility. *Journal of International Business Studies*, 51, 1034–1043.
- Greenstone, M., & Nigam, V. (2020). Does social distancing matter? SSRN Electronic Journal. <https://doi.org/10.2139/ssrn.3561244>
- Gupta, S., Montenegro, L., Nguyen, T., Rojas, F. L., Schmutte, I., Simon, K., Weinberg, B., et al. (2020). Effects of social distancing policy on labor market outcomes. <https://doi.org/10.3386/w27280>
- He, Z., Jiang, Y., Chakraborti, R., & Berry, T. D. (2022). The impact of national culture on COVID-19 pandemic outcomes. *International Journal of Social Economics*, 49(3), 313–335. <https://doi.org/10.1108/ijse-07-2021-0424>
- Hofstede, G. (2013). Culture's consequences: Comparing values. In *Behaviors, institutions, and organizations across nations*. Sage.
- Hsiang, S., Allen, D., Annan-Phan, S., Bell, K., Bolliger, I., Chong, T., Druckenmiller, H., Huang, L. Y., Hultgren, A., Krasovich, E., Lau, P., Lee, J., Rolf, E., Tseng, J., & Wu, T. (2020). The effect of large-scale anti-contagion policies on the COVID-19 pandemic. *Nature*, 584(7820), 262–267. <https://doi.org/10.1038/s41586-020-2404-8>

- Husted, B. W. (1999). Wealth, culture, and corruption. *Journal of International Business Studies*, 30, 339–359.
- Huynh, T. L. (2020a). Does culture matter social distancing under the COVID-19 pandemic? *Safety Science*, 130, 104872. <https://doi.org/10.1016/j.ssci.2020.104872>
- Huynh, T. L. D. (2020b). Does culture matter social distancing under the COVID-19 pandemic? *Safety Science*, 130, 104872. <https://doi.org/10.1016/j.ssci.2020.104872>
- Huynh, L. D. T. (2022). What Vietnam's localized lockdown policy showed: It did not work and was too late. *Regional Studies*, 57(9), 1882–1892. <https://doi.org/10.1080/00343404.2022.2137486>
- Inglehart, R., & Oyserman, D. (2004). Individualism, autonomy, self-expression. The human development syndrome. In H. Vinken, J. Soeters, & P. Ester (Eds.), *Comparing cultures, dimensions of culture in a comparative perspective* (pp. 74–96). Brill.
- Kazak, A. E. (2020). Psychology is an essential science: American psychologist highlights the role of psychology in understanding and addressing COVID-19. *American Psychologist*, 75(5), 605–606. <https://doi.org/10.1037/amp0000682>
- Kirkman, B. L., Lowe, K. B., & Gibson, C. B. (2006). A quarter century of culture's consequences: A review of empirical research incorporating Hofstede's cultural values framework. *Journal of International Business Studies*, 37(3), 285–320. <https://doi.org/10.1057/palgrave.jibs.8400202>
- Kolstad, I., & Wiig, A. (2009). Is transparency the key to reducing corruption in resource-rich countries? *World Development*, 37(3), 521–532.
- Lee, S. T., & Basnyat, I. (2013). From press release to news: Mapping the framing of the 2009 H1N1 a influenza pandemic. *Health Communication*, 28(2), 119–132. <https://doi.org/10.1080/10410236.2012.658550>
- Lipić, T., Štajduhar, A., Medvidović, L., Wild, D., Korošak, D., & Podobnik, B. (2022). Stringency without efficiency is not adequate to combat pandemics. *Chaos, Solitons and Fractals*, 160, 112217. <https://doi.org/10.1016/j.chaos.2022.112217>
- Ma, X., Chen, B., & Zhao, Y. (2024). The paradox of pandemic mitigation? Moderating role of pandemic severity on the impact of social distancing policies: A cultural value perspective. *Globalization and Health*, 20(1), 13–14. <https://doi.org/10.1186/s12992-024-01018-y>
- Prem, K., Liu, Y., Russell, T. W., Kucharski, A. J., Eggo, R. M., Davies, N., Jit, M., Klepac, P., & Klepac, P., Centre for the Mathematical Modelling of Infectious Diseases COVID-19 Working Group. (2020). The effect of control strategies to reduce social mixing on outcomes of the COVID-19 epidemic in wuhan, China: A modelling study. *The Lancet Public Health*, 5(5), e261–e270. [https://doi.org/10.1016/S2468-2667\(20\)30073-6](https://doi.org/10.1016/S2468-2667(20)30073-6)
- Raudenbush, S. W., & Bryk, A. S. (2002). Hierarchical linear models: Applications and data analysis methods (Vol. 1). Sage.

- Resnicow, K., Bacon, E., Yang, P., Hawley, S., Van Horn, M. L., & An, L. (2021). Novel predictors of COVID-19 protective behaviors among US adults: Cross-sectional survey. *Journal of Medical Internet Research*, 23(4), Article e23488. <https://doi.org/10.2196/23488>
- Rieger, M. O., & Wang, M. (2020). Secret erosion of the “lockdown”? Patterns in daily activities during the SARS-cov2 pandemics around the world. *Review of Behavioral Economics*, 7(3), 223–235. <https://doi.org/10.1561/105.00000124>
- Rieger, M. O., Wang, M., & Hens, T. (2021). Universal time preference. *PLoS One*, 16(2), Article e0245692. <https://doi.org/10.1371/journal.pone.0245692>
- Singer, J. D., & Willett, J. B. (2003). Introducing the multilevel model for change. *Applied Longitudinal Data Analysis*, 15, 45–74.
- Smith, P. B., Peterson, M. F., & Thomas, D. C. (2008). *The handbook of cross-cultural management research*. Sage Publications.
- Steenkamp, J. B. E., ter Hofstede, F., & Wedel, M. (1999). A cross-national investigation into the individual and national cultural antecedents of consumer innovativeness. *Journal of Marketing*, 63(2), 55–69. <https://doi.org/10.2307/1251945>
- Sully De Luque, M. F., & Sommer, S. M. (2000). The impact of culture on feedback-seeking behavior: An integrated model and propositions. *Academy of Management Review*, 25(4), 829–849.
- Valle, S. Y., Mniszewski, S. M., & Hyman, J. M. (2013). Modeling the impact of behavior changes on the spread of pandemic influenza. *Modeling the interplay between human behavior and the spread of infectious diseases* (pp. 59–77). Springer Science & Business Media.
- Winterich, K. P., & Zhang, Y. (2014). Accepting inequality deters responsibility: How power distance decreases charitable behavior. *Journal of Consumer Research*, 41(2), 274–293. <https://doi.org/10.1086/675927>
- Wolf, L. J., Haddock, G., Manstead, A. S., & Maio, G. R. (2020). The importance of (shared) human values for containing the COVID-19 pandemic. *The British Journal of Social Psychology*, 59(3), 618–627. <https://doi.org/10.1111/bjso.12401>

Author Biographies

JungWon Lee He graduated from Korea University’s doctoral program and his main areas of interest include E-Commerce and national cultural comparison.

Ohsung Kim Currently working as an associate professor focusing on industry-academia cooperation at Chungbuk National University. Holds a Master of Business Administration (MBA) and a Doctor of Business Administration with a major in Marketing from Korea University. Has published papers in the *Journal of Theoretical and Applied Electronic Commerce Research*, *International Journal of Electronic Commerce*

Studies, Korean management Review, and Asia Pacific Journal of Small Business.

Cheol Park He is a professor of global business at Korea University, South Korea. He received his BA in Economics, MBA and PhD in Business Administration from Seoul National University. He has visited universities in US, China, Mongolia, Cambodia, and Tanzania for the cross-cultural research in marketing and consumer behaviors. He has published papers in *International Marketing Review*, *Journal of Business Research*, *International Journal of Information Management*.