

The Mediation Effect of Persuasive Appeals on the Relationship between Individual Cultural Values and COVID-19 Vaccination Intentions in Taiwan

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Abstract

This study aimed to examine the mediation role of persuasive appeals on the relationship between individual cultural values and COVID-19 vaccination intentions. A cross-sectional online survey was conducted in the beginning of 2021, before COVID-19 vaccines were available in Taiwan. A total of 458 adult citizens participated in this study. Hayes PROCESS software was used to analyze the mediation effect to test hypotheses. Results indicated that persuasive messages indeed mediated the relationship between individual cultural values and intentions to obtain the COVID-19 vaccine. Collectivism indirectly affects vaccination intention through moral appeals. Uncertainty avoidance, masculinity, and long-term orientation indirectly impacted vaccination intention via fear appeals. Power distance indirectly influenced vaccination intention through

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punitive and reward appeals. Implications and limitations of this study were discussed.

Key Words: COVID-19, individual cultural values, health campaigns, persuasive appeals, vaccination intentions

Introduction

Since its discovery in Wuhan, China, in late 2019, COVID-19 virus has spread around the world, infecting more than 176 million, and killing more than 3.8 million people globally as of May 2021 (Taiwan Centers for Disease Control, 2021). Although Taiwan is a country exempted from the outbreak of COVID-19 because of being well-prepared, such as immediate border control and communication with the public to implement evidence-based epidemic prevention policies (Chang et al., 2021), it remains the major public health threat in Taiwan. Many experts believe that COVID-19 may become flu-like and coexist with humans (e.g., Ko1 et al., 2020). Vaccination may be a viable option to combat COVID-19 in the future (Kwok et al., 2021). Given that at least three-quarters of the population need to be immune through vaccination or prior infection to reach herd immunity to stop the spread of COVID-19 (Ko1 et al., 2020; Regalado, 2020), vaccine hesitancy remains a global challenge (Kwok et al., 2021). With no community infections in Taiwan, a prolonged epidemic may lead to fatigue in implementing preventive measures and overly optimistic about COVID-19 susceptibility, and reduce citizens' willingness to be vaccinated. For instance, a survey indicated that 63.5% of citizens perceived that COVID-19 was not severe in Taiwan, and only 40% of citizens were concerned about contracting the COVID-19 virus (Tsai et al., 2021).

With no prior-infection population in Taiwan, at least 75% of citizens need to be vaccinated to reach herd immunity to stop the spread of COVID-19 and be able to reopen border controls. Since vaccinations are not mandatory in Taiwan, citizens' vaccination intention determines whether herd immunity can be achieved to prevent the spread of the COVID-19 virus. Therefore, the vaccination campaign has become the next important epidemic prevention task in Taiwan,

after successfully preventing any potential outbreak of COVID-19 since the end of 2019 to date. Taiwan is one of the few countries that have successfully controlled the spread of the COVID-19 virus domestically; in addition to appropriate policies of COVID-19 prevention, citizens' compliance with measures has an important link with the successful containment of the epidemic (Chang et al., 2021). Scholars argued that interdependent (collectivism) and tight (restraint) societies tended to be more effective in preventing the spread of the COVID-19 virus than those of independent (individualism) and loose (indulgent), so epidemic prevention strategies need to be formulated based on social contexts (Van Bavel et al., 2020). Therefore, it is necessary to investigate the impact of culture on vaccination intentions based on the social context of Taiwan and explore appropriate communication strategies to improve COVID-19 vaccination rates in the future.

However, research findings in different countries had suggested that the important determinants of vaccine hesitancy seemed to be distrust of the vaccine safety (e.g., Banik, et al., 2021; Tsai et al., 2021; Thunström et al., 2021). Other indicators found to be associated with COVID-19 vaccination intentions included demographic, socioeconomic and behavioral factors (e.g., Banik, et al., 2021; Chu & Liu, 2021; Kadoya et al., 2021; Khubchandani et al., 2021; Song et al., 2022; Thunström et al., 2021), as well as beliefs and attitudes about vaccines (e.g., Chen et al., 2021; Chu & Liu, 2021; Sherman et al., 2020; Shmueli, 2021). While these studies have provided some preliminary insights into the demographic, socioeconomic, and behavioral factors associated with COVID-19 vaccination intention, factors such as personal characteristics and cultural values are understudied. As previous research suggested, cultural difference influenced how different countries combat the COVID-19 outbreak (Gokmen et al., 2020; Kwok et al., 2021). Further research also indicated that individuals from different ethnic groups were affected differently by COVID-19 (e.g., Khubchandani et

al., 2021). For instance, a recent survey of 17 countries (Wong et al., 2021) indicated that citizens of some countries (e.g., Australia, China and Norway) were more willing to receive the COVID-19 vaccination than those of others (e.g., Japan, the U.S. and Iran). By regions, a high proportion of likely to receive the COVID-19 vaccine was reported in Southeast Asian countries, while a high proportion reported being unlikely to receive the vaccine in the Americas (Wong et al., 2021). Another global study also indicated that COVID-19 vaccine acceptance tended to be high in the Asian nations (except Japan) where the public had strong institutional trust (Lazarus et al., 2021). While these findings provided various countries and regions with target population they need to achieve to increase vaccine acceptance and coverage, their results failed to explore why citizens of certain countries were more willing to be vaccinated than those of others. Therefore, all countries must develop individually-tailored strategies to increase their citizens' confidence in vaccination (Wong et al., 2021). For instance, previous findings indicated that different persuasive appeals convinced individuals held different cultural values (Hetsroni, 2000). Further studies also found that different persuasive strategies had different impact on individuals' willingness to be vaccinated (Ye et al., 2021). In other words, persuasive messages may mediate between individual cultural values and intentions to receive a COVID-19 vaccine. No study has looked at this mediating role.

Rationale and Hypotheses

Individual Cultural Values

To make health communication as effective as possible, researchers and practitioners should consider the cultural and individual values of the target audience (Gallopel-Morvan et al. 2011; Hastall & Knobloch-Westerwick, 2013;

Dutta & Vanacker, 2000). Hofstede's theory of six cultural dimensions provides a framework to study the effect of individual cultural values on health behaviors. The theory explains the effects of a culture on the values of its members, and how these values relate to behaviors. For instance, a recent study had demonstrated the six dimensions of cultural values in examining the impact of countries' cultural values on the infect cases of COVID-19 (Gokmen, Baskici, & Ercil, 2020). Although the six dimensions of cultural values can be examined at both collective (such as country, organizational and occupational) and individual levels (Hofstede, 2011), this research will focus on the individual level. "By measuring individual cultural orientations and not equating them to the national culture, researchers can avoid the ecological fallacy that occurs when ecological or country-level relationships are interpreted as if they are applied to individuals" (Yoo et al., 2011, p195). The collective level of cultural values may be not useful predictors of individual behaviors because it is unclear which aspects of culture influence an individual's behaviors (Bond, 2002; Hofstede, 1991; Sharma, 2010), especially in a country with a multiethnic population like Taiwan. Therefore, the individual level of cultural values should better explain the influence of culture on citizens' health behaviors in Taiwan. Demonstrating links among Hofstede's individual-level cultural dimensions, persuasive strategies, and vaccination intentions may further elaborate understanding of the role of cultural values and persuasive appeals in vaccination campaigns. The six cultural dimensions include individualism/collectivism, uncertainty avoidance, long-term/short-term orientation, masculinity/femininity, power distance and indulgence/restraint.

Individualism/Collectivism

This dimension provides a conceptual grid for describing how self-concepts vary across cultures (Hofstede, 1983). For instance, individualists may strive for autonomy, dominance, control and power to reinforce and protect the individual

differentiation, while collectivists may strive for intimacy, connectedness, and solidarity with a social entity, and be highly motivated by the need to care for others (Uskul & Hynie, 2007). To date, the health related studies had explored the concept of individualism/collectivism more than the other five cultural dimensions. For instance, recent studies suggested that promoting collectivism may be a way to increase engagement with efforts to reduce the spread of COVID-19, as a sense of collectivism might improve attitudes towards behaviors involving personal sacrifice (e.g., Biddlestone et al., 2020).

The individual level of individualism and collectivism is synonymous with some personality traits, such as idiocentrism and self-construal. For instance, Dutta and Vanacker's (2000) study had demonstrated how idiocentrism affected preference types of persuasive appeals in public health campaigns. Their findings indicated that low idiocentrics (collectivists) had a more positive attitude toward social appeals (reinforcing group membership and affiliation), while high idiocentrics (individualists) toward functional (focusing on problem solving and prevention) and sensory (stressing sensory gratification needs) appeals. Uskul and Hynie's (2007) study had demonstrated the relationship between self-construal and illness-related concerns. Their findings indicated that interdependent self-construal (collectivism) was associated with the social-illness concerns (the consequence of illness affecting others or changes in relationships), while independent self-construal (individualism) was correlated with the personal-illness concerns (the consequence of illness affecting self's behavior, well-being, or self-conceptions). A recent research also indicated that collective responsibility was associated with a higher tendency to receive a COVID-19 vaccine (Kwok et al., 2021). In other words, it is reasonable to assume that collectivists will be highly concern about the welfare (such as health) of their society and family during a pandemic, like COVID-19. Therefore, collectivism will be positively related to COVID-19 vaccination intention.

Uncertainty Avoidance

This dimension has been conceptualized as the extent to which an individual is anxious about unknown or uncertain situations and therefore establishes structure to avoid experiencing this continuous threat (Hofstede, 2001). A highly uncertainty avoiding individual will try to avoid uncertain situations by establishing rules and rituals to control social behaviors to ensure that the constant threat of unpredictability is overcome to a certain extent (Hofstede, 2011). Apparently, a global pandemic will arouse high degree of anxiety for each individual, and the anxiety is associated with uncertainty (Jiwani et al., 2021). For highly uncertainty avoiding individuals, the uncertainty inherent in life is perceived as a continuous threat that must be fought (Hofstede, 2011). For them, controlling behaviors (such as vaccination or compliance with epidemic prevention measures) may be the best and fastest way to overcome the threat and uncertainty caused by COVID-19. However, research indeed indicated that the perceived threat of infection reduced vaccine hesitation (Khubchandani et al., 2021), although the uncertainty caused by vaccine novelty led to distrust of vaccine safety that was the most important determinant of COVID-19 vaccine hesitation (Thunström et al., 2021). In the absence of effective medicine, vaccine is more likely to be the best choice for reducing the threat of COVID-19. In other words, uncertainty avoidance should be positively associated with COVID-19 vaccination intention.

Long-term/Short-term Orientation

This dimension relates to an individual's choice of focusing efforts on the future, present or past (Hofstede, 2011). A short-term oriented individual prefers to maintain and honor traditions, and views societal changes with suspicion, while a long-term oriented individual takes a more pragmatic approach to value thrift and efforts in modern education as a way to prepare for the future (Hofstede

Insight, 2021). In other words, a long-term oriented individual prefers to learn from others, values efforts, and plans for the future (Hofstede, 2011). Apparently, a global pandemic will impact and threaten each individual's life in the present and the future, especially for those highly concern about the future. For long-term oriented individuals, the most important events in life will occur in the future (Hofstede, 2011), such as the effect of COVID19. In other words, long-term orientation should be positively related to COVID-19 vaccination intention.

Masculinity/Femininity

This dimension explains how individuals perceive material achievements, human concerns and gender roles. Individuals high in masculinity prefer for achievement, heroism, assertive and material rewards for success, and emphasize specific gender roles, while individuals high in femininity prefer for cooperation, humility, caring for the weak and quality of life, and emphasize gender equality (Hofstede, 2011). In other words, individuals high in femininity are expected to display more cooperative behaviors when taking steps to prevent the COVID-19 outbreak. However, a previous finding indicated that masculinity had no significant effect on a country's infection rate of COVID-19, even though countries high on masculinity were expected to be less effective in implementing COVID-19 prevention measures (Gokmen et al., 2020). Nonetheless, for ambitious individuals seeking for success in material rewards like those high in masculinity, COVID-19 should have a significant impact on their lives (such as unemployment) and worry about their career in the future. They may be willing to receive COVID-19 vaccination if the vaccine is the only and fast way to stop the spread of epidemic. In other words, masculinity should be positively related to COVID-19 vaccination intention.

Power Distance

This dimension refers to the degree to which the less powerful members

of a society accept and expect the uneven distribution of power; for example, less powerful individuals are expected to be told what to do, and children are taught to obey (Hofstede, 2011). Individuals high in power distance accept a hierarchical order, in which each member has a place in a society and no further justification is needed; those high in power distance tend to be less questioning of authority in general (Hofstede, 2001). Research indeed indicated that individuals in high power distance were reluctant to refuse a request from or disagree with the authority, but prioritized the authority's opinions (Jung & Kellaris, 2006). A further finding also suggested that individuals in low power distance were more susceptible to statistical evidence than expert evidence (Hornikx & Hoeken, 2007). Moreover, studies indicated that power distance had a negative effect on COVID-19 infection rates (Gokmen et al., 2020; Messner, 2020), as members of low power distance countries were less willing to accept instructions from authorities, and this could have adverse effects on controlling an outbreak of COVID-19 (Messner, 2020). In other words, high power distance individuals tend to follow the advice of the authorities, obey social norms, and support government policies, such as CDC's COVID-19 vaccination regulations. Therefore, power distance will be positively related to COVID-19 vaccination intention.

Indulgence/Restraint.

This dimension involves the gratification versus control of basic human desires related to enjoying life (Hofstede, 2011). Indulgence refers to an individual being allowed relatively freedom to satisfy basic and natural human needs related to the enjoyment of life, while restraint refers to an individual's satisfaction of needs being suppressed and regulated by strict social norms (Hofstede Insight, 2021). Indulgent individuals pursue simple joys and having fun, and believe themselves to be in control of their own lives and emotions;

in opposite, restrained individuals believe other factors control their lives and emotions (Hofstede, 2011). Although a global pandemic will impact each individual's lives, it is assumed that indulgence-oriented individuals will be less threatened by and less involved in COVID-19. Previous studies indeed indicated that a country's indulgent tendency was positively linked to the outbreak (Messner, 2020) and infection cases of COVID-19 (Gokmen et al., 2020), as cultures accustomed to higher level of indulgence had more difficulty coordinating themselves during an outbreak. (Van Bavel et al., 2020). In other words, indulgent oriented individuals will find it harder to accept the restrictions (e.g., vaccination) imposed to prevent outbreaks of COVID-19. Specifically, indulgence should be negatively related to COVID-19 vaccination intention.

Persuasive Appeals

Persuasive appeals are strategies used during argumentation and communication. As vaccine hesitancy varies across societies, different communication strategies will be needed within and between countries (Warren & Lofstedt, 2021). However, some cultural values will be correlated with certain persuasive strategies (Hetsroni, 2000). Based on the culture of Taiwan and the context of COVID-19, four persuasive appeals were evaluated: *moral, fear, punitive and reward appeals*. These persuasive messages will be assessed to examine the impact of individual cultural values on COVID-19 vaccination intention in Taiwan.

Moral Appeals

Health campaigns, especially if publicly funded, need to be assessed along their ethical premises (Hansen et al., 2018). A previous research in the U.K. suggested that campaigns and messaging about a COVID-19 vaccination could consider emphasizing the risk of COVID-19 to others and the necessity

for everyone to be vaccinated (Sherman et al., 2020). Moral messages can be organized along an argumentative spectrum ranging from altruistic to an almost obligatory claim (Hansen et al., 2018). Studies in moral psychology have shown that the acceptance of moral/social duties is an important and prevalent mode of behavior in modern societies (Hansen et al., 2018; Kohlberg, 1982). A research in Hong Kong indicated that citizens' collective responsibility was associated with higher tendency to receive COVID-19 vaccines (Kwok et al., 2021). In addition to social responsibility, the decision for vaccination should also consider relatives and others, especially in a family-oriented collective society, like Taiwan. In other words, moral appeals which relate to altruism, social and family responsibilities should motivate collective oriented individuals to receive the COVID-19 vaccine. Therefore, the following hypothesis is posed.

H1. Moral appeals will mediate the relationship between collectivism and COVID-19 vaccination intentions.

Fear Appeals

In health campaign, fear-arousal messages are the most commonly used persuasive strategies to gain compliance. "Fear appeals are persuasive messages designed to scare people by describing the terrible things that will happen to them if they do not do what the message recommends" (Witte, 1992, p. 329). According to the Extended Parallel Process Model (EPPM), the content of health-related interventions needs to contain two basic elements: threat and efficacy information. Threat messages must describe the severity or the extent of threat and the susceptibility of a threat outcome; efficacy information or solutions must contain the effectiveness of the recommended actions and evidence of the recipient's ability to carry out the recommended actions (Witte, 1992). For countries like Taiwan with low infection rates (Chang et al., 2021), the persuasive strategy based on fear appeals with evidence and solutions may be

more effective in arousing public vigilance about the possibility of an outbreak at any time (perceived severity and susceptibility) and providing effective and feasible solutions such as vaccination (perceived efficacy). However, research findings suggested that the receiver's cultural background should be taken into account when developing a fear appeal message (Jansen & Kroef, 2019). A further research also suggested that differences in responses to a health-related fear appeal could be explained by personal characteristics (Meulenaer et al., 2015). For highly uncertainty avoiding individuals, the uncertainty inherent in life is perceived as a constant threat that must be dealt with (Hofstede, 2011). Therefore, vaccination is more likely to be the best behavior and fastest way for them to respond to the uncertainty caused by COVID-19 if the persuasive message contains a threat and provides a solution, such as evidence-based fear appeals.

As mentioned earlier, a global pandemic may have more impact and threat on masculinity and long-term oriented individuals. Individuals high in masculinity tend to value material achievements (Hofstede, 2021), and their lives will be more likely to be affected by economic recession derived from COVID-19. In order to let their lives return to normal, they may try to find a way out of the pandemic, and perhaps solution-based fear appeals are likely to be accepted by them. Relatively speaking, the global pandemic will have a greater impact and threat on long-term oriented individuals due to their concerns about the future. To remove the obstacle in their future, long-term oriented individuals may have to engage themselves in the issue of COVID-19, such as thoughtfully assessing the impact of the pandemic on their lives, searching for relevant information, and coming up with the best solution. The more the recipient of a message engages with the issue, the more salient, relevant, or important the issue becomes to the recipient and the greater the recipient's motivation to consider the message (Petty & Cacioppo, 1986). In other words, the more they are involved

with COVID-19, the more threat they perceive. Threat will evoke fear which will motivate recipients of the message to follow the recommendation to overcome their fears (Witte, 1992). These cognitive processes mediate the persuasive effects of a fear appeal by arousing protective motivation which is an intervening variable that arouses, sustains, and directs activity to protect the self from danger (Maddux & Rogers, 1983). In other words, individuals who are uncertainty avoidant, masculine, and long-term oriented may find evidence-based fear appeals (that evoke fear and offer solutions) persuasive. Therefore, the following hypotheses are proposed.

H2. Fear appeals will mediate the relationship between uncertainty avoidance and COVID-19 vaccination intentions.

H3. Fear appeals will mediate the relationship between long-term orientation and COVID-19 vaccination intentions.

H4. Fear appeals will mediate the relationship between masculinity and COVID-19 vaccination intentions.

Punitive and Reward Appeals.

According to behaviorism (Skinner, 1974), human behaviors are not derived from initiative or self-will, but rather are the result and response to either positive or negative reinforcement, such as punishment and reward. The experiences individuals receive with rewards and punishments in life will shape how they behave (Skinner, 1974). For instance, punitive regulations against COVID-19 had played a significant role in Singapore and Taiwan, such as fines for violating home quarantine and not allowing entry into public buildings without masks. Law and order have always been an effective way to protect the public welfare during an outbreak. According to Hofstede, Singapore and Taiwan are countries with relatively large power distance. (Hofstede Insight, 2021). For societies with higher power distance, citizens are more likely to comply with punitive

regulations against COVID-19 (Chang et al., 2021). Reliance on punitive appeals is inevitable in societies with high power distance and low COVID-19 infection rates, as low infection rates may lead citizens to be overly optimistic about their susceptibility to COVID-19 and thus reduce their willingness to be vaccinated.

In addition to punitive appeals, the promise of external rewards (such as a round-trip flight to Japan or a cash reward) may urge people who already comply with certain measures (such as wearing a mask) to take more action (such as receiving a vaccine). The delivery of both punishments and rewards involves the demonstration of power (Tjosvold, 1995). Since individuals with high power distance are more likely to accept a hierarchical order in society (Hofstede Insight, 2021), they are more likely to be motivated by demands for punishment and reward from authorities. Perhaps, they may be more likely to obey CDC's punitive or reward appeals to receive a COVID-19 vaccine.

Moreover, research findings suggested that highly restrained countries usually established strict social norms to govern and control their citizens' behaviors (DeBode et al., 2020); by contrast, high indulgent countries will prioritize enjoyment and the satisfaction of needs over restrictions (Messner, 2020). In other words, indulgent oriented individuals may prefer to follow joyful and rewarding strategies to receive a COVID-19 vaccination. Based on the above discussion, the following hypotheses are posed.

H5. Punitive appeals will mediate the relationship between power distance and COVID-19 vaccination intentions.

H6. Reward appeals will mediate the relationship between power distance and COVID-19 vaccination intentions.

H7. Reward appeals will mediate the relationship between indulgence and COVID-19 vaccination intentions.

Methods

A survey research was selected for this study to investigate the correlation among individual cultural values, persuasive strategies, and vaccination intentions. To ensure the validity and reliability of the measurement instrument, a pilot study was conducted on 208 college students at a small university. To check the convergent and discriminative validity of each scale, exploratory factor analysis was conducted via principal component procedure, varimax rotation and an eigenvalue of 1.0 for factor extraction in the pilot study and the main study. The scale reliability was confirmed by Cronbach's alpha values. Finally, all valid and reliable scales were enclosed in a cross-sectional online survey conducted before the vaccine available in Taiwan. Since the survey was for all adult citizens in Taiwan, the convenience and snow-ball sampling were applied to recruit participants nationwide.

Measurement Instruments

There were three scales used in this study to measure above three variables. In addition to the scale of individual cultural values (Yoo et al., 2011), scales of persuasive appeal and vaccination intention were developed in this study. As suggested by previous findings (e.g., Corbu et al., 2021; Grüner & Krüger, 2020; Kadoya et al., 2021; Kwok et al., 2021; Thunström et al., 2021; Tsai et al., 2021), demographic variables of gender, age, education and flu uptake were also included in the questionnaire. All scales were in a 7-point Likert-type format ranging from “strongly disagree” to “strongly agree.”

Persuasive Appeals

The Persuasive Messages Scale (PMS) was developed in this study to measure the effectiveness of persuasive appeals for COVID-19 vaccination.

Based on previous findings from EPPM and behaviorism discussed in the earlier section, four sub-scales were developed: moral, punitive, reward, and fear appeals. Each subscale consisted of 3 items of persuasive messages. Respondents were asked to rate how persuasive each message was in convincing them to get the COVID-19 vaccine. The four dimensions of PMS consisted of 12 items and had reliability coefficient alpha from .92 to .95 in this study. Before the 12 items of PMS, a scenario was presented. (see table 1)

Table 1.

Content of Persuasive Appeals Scale

Scenario:

A COVID-19 vaccine is coming soon. To promote the citizens to get vaccinated, the CDC is planning for a vaccination campaign. Please help evaluate the persuasiveness of the following persuasive messages. Please assess the likelihood that each message will convince you to receive a COVID-19 vaccine.

Moral appeals:

1. To protect our families and love one, lets' get vaccinated against COVID-19.
2. To protect the health of our communities and humans, lets' get vaccinated against COVID-19.
3. For the health of future generations, lets' get vaccinated against COVID-19.

Punitive appeals:

4. Every citizen must be vaccinated against COVID-19. Violators will be fined NT\$50,000!
5. Individuals who have not been vaccinated against the COVID-19 virus are not allowed to enter public buildings.
6. Individuals who have not been vaccinated against the COVID-19 virus are not allowed to take public transportation!

Reward appeals:

7. Taking COVID-19 vaccine will earn an opportunity to participate in the Million Lottery Draw!
8. Taking COVID-19 vaccine will get a cash gift of NT\$1000 immediately!
9. Taking COVID-19 vaccine will earn an opportunity to receive a round-trip air ticket to Japan

(continued)

Table 1. (continued)

Fear appeals:

- 10.The fatality rate of COVID-19 pandemic is three times that of seasonal flu, only vaccination can free us from its threat!
- 11.The COVID-19 virus will coexist with us on the Earth forever, only vaccination can free us from its threat.
- 12.The COVID-19 virus can cause lung damage permanently, only vaccination can free us from its threat!an cause lung damage permanently, only vaccination can free us from its threat!

Vaccination Intentions

The Vaccination Intention Scale (VIS) was developed in this study to measure participants' willingness to receive a COVID-19 vaccine as soon as it is available. The VIS consisted of 4 items and had reliability coefficient alpha .96 in this study.

1. I will get a COVID-19 vaccine as soon as it becomes available.
2. I will convince my family and friends to get the COVID-19 vaccine.
3. I will help persuade people to get the COVID-19 vaccine.
4. I would still choose to get the COVID-19 vaccine, even if I have to pay for the vaccination myself.

Individual Cultural Values

The Six-Dimensional Scale of Individual Cultural Values (CVSCALE) was employed to measure individual cultural values. Developed by Yoo, Donthu and Lenartowicz (2011), the original CVSALE contained only five dimensions: power distance, uncertainty avoidance, collectivism, long-term orientation, and masculinity. To update Hofstede's (2021) theory, the sixth dimension of cultural values, indulgence/restraint was added in this study. The indulgence subscale consisted of 4 items developed in this study.

1. I won't worry if I can't finish my task on time.

2. I enjoy each day, and never plan for tomorrow.
3. It's important to enjoy life and have fun instead of worrying about the future.
4. It's meaningless to worry about the future because fate is responsible for my future.

Finally, the Six-Dimensional Scale of CVSCALE was translated into Mandarin Chinese via back translation techniques. This scale consisted of 27 items in a 7-point Likert-type format and had reliability coefficient alpha from .73 to .92 in this study.

Participants

Prior to the launch of the COVID-19 vaccine in Taiwan, adult citizens were invited to participate in the study through personal recommendation via email, Line, and Facebook, between January 10 and February 12, 2021. After removing 17 foreign respondents, a total of 458 respondents participated in this study including 159 (34.7%) males and 299 (65.3%) females. Their average age was 43.47 (SD=15.79) between 18 and 80. Participants' level of education ranged from middle school (3.49%), high school (10.70%), associate's (13.54%), bachelor's (50.22%), master's (16.81%) to doctorate (4.59%), and 3 (0.65%) of them were unidentified. Among the 458 participants, 70 (15.28%) were college students and 388 (84.12%) were non-students. All respondents were voluntarily participated in this study without compensation.

Results

Preliminary Analysis

Table 2 summarized the correlation, means, and standard deviations for each variable, as well as the reliability of each scale. Descriptive statistics indicated

that participants in this study were, on average, characterized by high uncertainty avoidance, collectivism, long-term orientation, restraint (low indulgence), and low power distance. Moral appeals were perceived as the most effective strategy in persuading our participants to accept the COVID-19 vaccine, following by fear, punitive, and reward appeals. In order to see the bivariate relationships among the demographic, independent and dependent variables, a correlation matrix was computed and reproduced. Gender and years of education were correlated with vaccination intention, but not age. Male and more educated participants were more likely to be vaccinated. With the exception of indulgence, five types of cultural values and four types of persuasive appeals were positively associated with the COVID-19 vaccination intentions.

Table 2

Pearson Correlations, Means, Standard Deviations and Reliability

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. gender	1													
2. age	-	1												
3. education	-	-	1											
4. moral appeals	-.08	.15**	-.16**	1										
5. punitive appeals	-.01	-.01	-.17**	.45**	1									
6. reward appeals	-.03	-.13**	-.10*	.28**	.47**	1								
7. fear appeals	-.10*	.18**	-.19**	.62**	.54**	.40**	1							
8. power distance	-.09*	-.13**	.02	.12*	.27**	.29**	.24**	1						
9. uncertainty avoidance	.02	.20**	-.19**	.37**	.19**	.12**	.34**	-.05	1					
10. collectivism	.06	.34**	-.25**	.39**	.22**	.16**	.40**	.07	.56**	1				
11. masculinity	-.19**	.27**	-.20**	.13*	.24**	.19**	.25**	.32**	.20**	.35**	1			
12. long-term orientation	-.09*	.31**	-.25**	.39**	.28**	.18**	.44**	.09*	.58**	.67**	.32**	1		
13. indulgence	-.13**	-.15**	.03	.07	.12*	.21**	.06**	.50**	-.10*	.06	.33**	.03	1	
14. intention	-.15**	.08	-.17**	.79**	.50**	.36**	.72**	.19**	.39**	.37**	.18**	.42**	.04	1
M	-	43.47	-	5.41	3.63	3.36	4.79	2.27	6.02	5.49	3.45	5.54	2.63	4.53
SD	-	15.79	-	1.52	2.11	2.09	1.77	1.48	1.08	1.34	1.64	1.03	1.41	1.86
Cronbach α	-	-	-	.95	.94	.92	.92	.91	.90	.92	.85	.73	.86	.96

n = 458

** p<.01 * p<.05

Test of Hypotheses

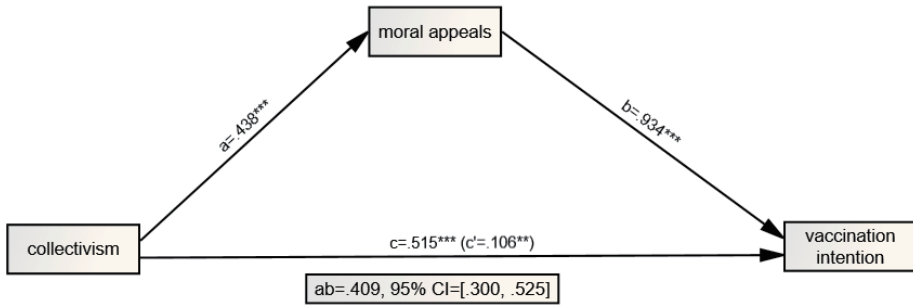
To test hypotheses, seven simple mediation models were specified to examine the indirect effects of 6 cultural values on vaccination intention through 4 persuasive appeals, and indirect effects were evaluated via Hayes PROCESS model number 4. Mediation pathways were assessed by evaluating 95% confidence intervals (CI) yielded via 5,000 bootstrapping resampling draws. Bootstrapping provides point estimates and confidence intervals to assess the significance or non-significance of a mediation effect; point estimates reveal the mean over the number of bootstrapped samples and a significant mediation effect can be reported if zero does not fall between the resulting confidence intervals of the bootstrapping method (Hayes, 2018).

From each simple mediation model (refer to figure 1 to 7), path a is a form of direct correlation between individual cultural values and persuasive appeals. Path b is a form of direct correlation between persuasive appeals and vaccination intentions. Path c is a form of direct correlation between individual cultural values and vaccination intentions. It can be seen that the product of a and b indicated an indirect effect of persuasive appeals on the relationship between individual cultural values and COVID-19 vaccination intention. An indirect effect exists when a, b and c are statistically significant, and the 95% of CI does not include zero (Hayes, 2018).

Results indicate that hypothesis H1 to H6 were supported, but H7 was not. Collectivism had an indirect effect on vaccination intention via moral appeals because a, b and c were significant, and the 95% of CI did not include zero [.300, .525]. Therefore, H1 was supported. (see figure 1)

Figure1

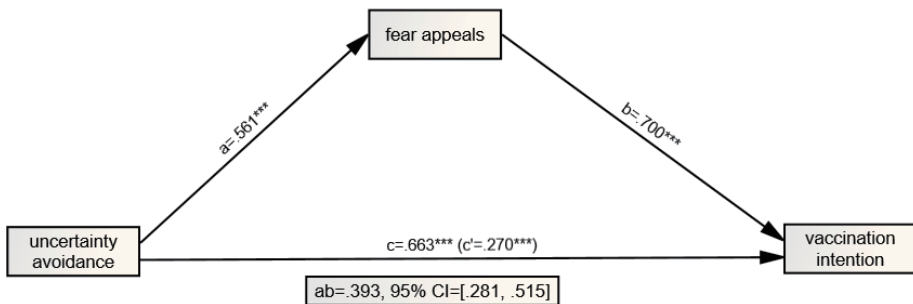
The indirect effect of collectivism on vaccination intention via moral appeals



Uncertainty avoidance had an indirect effect on vaccination intention via fear appeals because a, b and c were significant, and the 95% of CI did not include zero [.281, .515]. H2 was supported. (see figure 2)

Figure 2

The indirect effect of uncertainty avoidance on vaccination intention via fear appeals

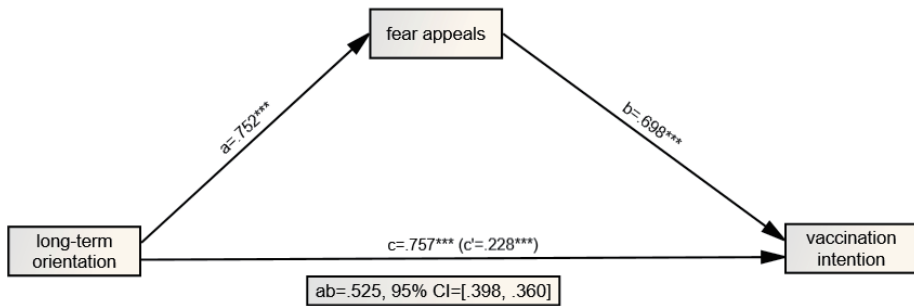


Long-term orientation had an indirect effect on vaccination intention via fear appeals because a, b and c were significant, and the 95% of CI did not include

zero [.398, .360]. H3 was supported. (see figure 3)

Figure 3

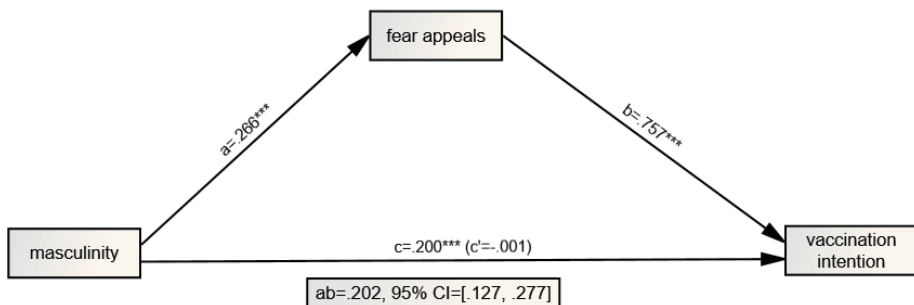
The indirect effect of long-term orientation on vaccination intention via fear appeals



Masculinity had an indirect effect on vaccination intention via fear appeals because a, b and c were significant, and the 95% of CI did not include zero [.127, .277]. H4 was supported. (see figure 4)

Figure 4

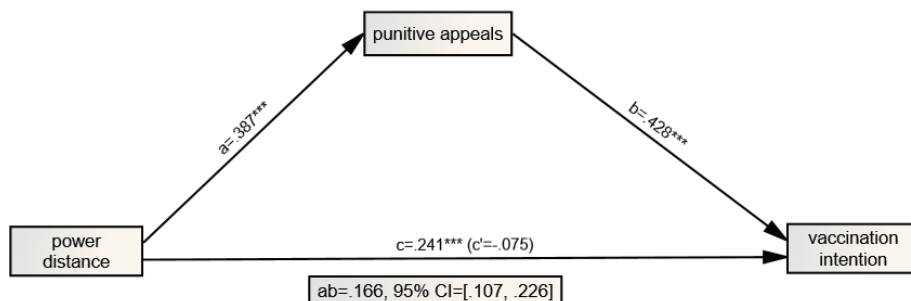
The indirect effect of masculinity on vaccination intention via fear appeals



Power distance had an indirect effect on vaccination intention via punitive appeals because a, b and c were significant, and the 95% of CI did not include zero [.107, .226]. H5 was supported. (see figure 5)

Figure 5

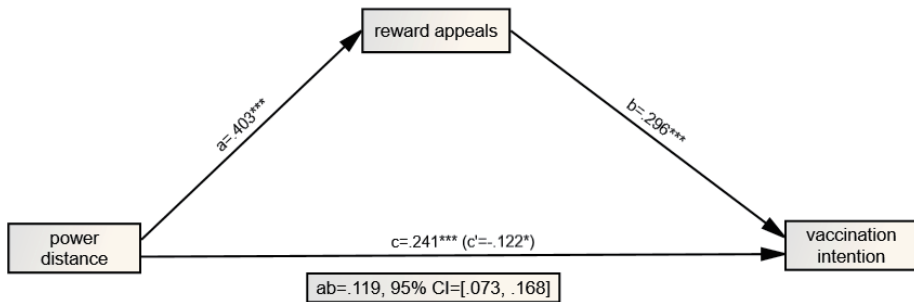
The indirect effect of power distance on vaccination intention via punitive appeals



Power distance had an indirect effect on vaccination intention via reward appeals because a, b and c were significant, and the 95% of CI did not include zero [.073, .168]. H6 was supported. (see figure 6)

Figure 6

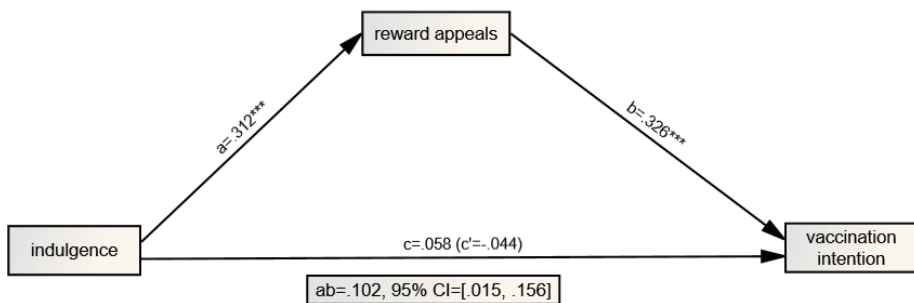
The indirect effect of power distance on vaccination intention via reward appeals



However, hypothesis H7 was not supported. The seventh mediation model resulted in a nonsignificant effect of indulgence on the COVID-19 vaccination intention (Coeff=.058, SE=.062, $p > .05$). (see figure 7)

Figure 7

The indirect effect of indulgence on vaccination intention via reward appeals



Discussion

This study had examined the correlations among individual cultural values, persuasive messages and vaccination intentions to explain how these variables interact and influence citizens' compliance with vaccination policy in the context of COVID-19 crisis in Taiwan. Results indicated that persuasive appeals mediated the relationship between five dimensions of cultural values and COVID-19 vaccination intention. These results were in line with previous findings in other countries. For example, a large-scale analysis of cultural values and vaccination intentions at the country and individual levels also found that people from countries with higher levels of cultural collectivism had higher COVID-19 vaccination intentions, and that collectivistic individuals were more likely to receive the COVID-19 vaccine (Leonhardt & Pezzuti, 2022). Collective responsibility was associated with higher tendency to receive the COVID-19 vaccine (Kwok et al., 2021), and moral appeals should be highly considered in collective societies, like Israel (Hetsroni, 2000). Power distance and collectivism positively impact a country's COVID-19 infection rate (Gokmen et al., 2021). Based on previous findings and Hofstede's six dimensions of cultural values theory, the results of this study further provided a more comprehensive and holistic understanding of the relationship among individual cultural values, persuasive appeals and vaccination intentions.

In contrast to prior studies, the finding that indulgence had no significant effect on COVID-19 vaccination intention failed to support hypothesis H7. However, differences in social context may influence message effect on indulgent individuals. As our data indicated, 458 participants were high in uncertainty avoidance, long-term orientation, and collectivism, but low in power distance and indulgence. These characteristics imply a group of highly self-controlled citizens who take epidemic prevention seriously. When the majority of citizens are highly

uncertainty avoidant, collectivist, and long-term oriented, indulgent individuals may experience pressure and cannot ignore the efforts of others in preventing COVID-19. This may provide an explanation for a nonsignificant association between indulgence and vaccination intentions.

The above findings also partially explain why Taiwan has been able to successfully prevent any domestic COVID-19 outbreaks. Taiwan is subject to a political blockade by the World Health Organization and can only rely on itself to collect data and fight the epidemic based on its own experience. Because citizens are highly uncertainty-avoidant, collectivist, and long-term oriented, they are highly concerned about COVID-19 issues and committed to implementing epidemic prevention measures (e.g., wearing masks in public places, washing hands frequently, and undergoing quarantine as needed). In order to reduce public uncertainty, the CDC has held a press conference daily since the beginning of 2020 to answer questions related to the COVID-19 epidemic.

Implications and future research

The findings provide both theoretical and practical implications that demonstrated the utility of six dimensions of individual cultural values and four types of persuasive appeals in understanding COVID-19 vaccination intentions. For researchers, this study is significant because it is the first examples of investigating the relationship between individual cultural values and COVID-19 vaccination intentions. It explores an understudied aspect of the communication strategies in fighting against the spread of COVID-19. Its findings suggest that taking six dimensions of cultural values at individual level is a viable way to examine an individual's cultural orientations. Its findings also suggest that health communicators need to look at individual cultural values as a segmentation variable for audience-adaptive selection and message designing purposes in various health campaigns. Finally, individual cultural values, persuasive appeals

and vaccination intentions are likely interact with each other in a dynamic way over the development of the epidemic. Further research may explore these variables in a longitudinal design that will provide more robust evidence of the association of these variables.

A persuasive appeal may be able to motivate individuals hold a particular cultural value for a specific reason. This brings us to the issue of audience segmentation when using persuasive appeals. Practitioners should be aware of different individuals' attitudes towards persuasive messages and corresponding vaccination intentions. The results of this study suggest that policymakers should tailor prevention measures to the individual cultural values of their audiences. COVID-19 communications and messaging should be consistent with individual cultural values to increase the likelihood that individuals will comply with preventive measures. For instance, "*To protect our families and love one, lets' get vaccinated against COVID-19.*" may be a preferred communication strategy for collectivists, whereas "*For your health, get vaccinated against COVID-19.*" may be more fit in individualists. For individuals high in power distance, messages may include the emphasis that actions are recommended by authorities. For individuals who are uncertainty avoidant, masculine and long-term oriented, evidence-based messages that contain threats and offer solutions may be an appropriate communication strategy.

Limitations

There were several limitations of this study. First, there is a risk of inaccurate self-reporting and selection bias because the data were collected through an online survey. Since a COVID-19 vaccine was not yet available in Taiwan at the time of data collection, this study could only investigate factors associated with intention to be vaccinated rather than factors related to vaccination. Our outcome variable was a measure of behavioral intentions,

rather than actual behavior, which was likely to be an underestimation of future behavior. Given that one's actual behaviors solely depends on one's intention (Armitage & Conner, 2000), research on COVID-19 vaccination intention remains relevant and valuable. Second, most of the research in the field of communication cited in this article draws on US-centric literature, which may bias the results of this study. While we frame our argument by citing white and non-white authors in accordance with the #CommunicationSoWhite initiative, the majority of scholars cited in this study are white. Nonetheless, the findings of this study provide evidence of a non-white population. It is hoped that this study can inspire further cross-cultural comparative studies.

In addition to high homogeneity resulting from convenience and snowball sampling, this study is also limited by unbalanced sample structure (e.g., gender and educational level). Since participants were recruited on a voluntary basis, females were intuitively more altruistic than males (Rand, Brescoll, Everett, Capraro, & Barcelo, 2016) and were more willing to participate in unremunerative research. Among 458 participants, 299 were females, and 159 were males. A high proportion of female respondents might have biased our sample to those who were more feminine individuals. Females tend to be moral-oriented that might bias the result related to moral appeals. Future research may provide incentive for participants in the process of sample recruitment.

Furthermore, participants were recruited through referrals from the researchers' social networks so that most respondents were highly educated. Of the 458 respondents, there were 393 (85.8%) reported having a college degree. This may limit the results that can be generalized to different social groups in Taiwan and compromise the external validity of this study. This may also be the reason why 458 respondents reported lower power distance scores. This finding was unexpectedly inconsistent with Hofstede's data that indicated Taiwan was a high power distance society. The reason for the inconsistency may be that highly

educated citizens have been influenced by Western cultures during the process of globalization. This could be the case of Taiwanese culture which has gradually become Americanized as it has moved from totalitarianism to democracy over the past few decades. However, future research may clarify this issue by comparing the disparity of cultural values cross generations and social classes. Despite these problems with the characteristics of sample, the scales used in this study yielded data that were statistically significant and consistent with previous findings.

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檢視說服訴求對個人文化價值觀與 COVID-19 疫苗接種意願的中介關係

鄭嫻嫻

摘要

本研究的目的是檢驗說服訴求對個人文化價值觀與 COVID-19 疫苗接種意願之間的中介關係。研究的資料是在 2021 年初，台灣提供公費 COVID-19 疫苗之前，所進行的一項橫斷面網路問卷調查。最後共有 458 名成年的台灣國民參與填答問卷，所得數據以 Hayes 的 PROCESS 統計軟體分析中介效應以驗證研究假設。結果顯示，四種說服訴求對個人文化價值觀與 COVID-19 疫苗接種意願之間的中介關係確立。集體主義的文化價值觀通過道德訴求間接影響疫苗接種意願。不確定性迴避、陽剛性和長期取向等三種文化價值觀通過恐懼訴求間接影響疫苗接種意願。權力距的文化價值觀通過懲罰和獎勵訴求間接影響疫苗接種意願。本文最後討論了研究結果的運用與研究限制。

關鍵詞：COVID-19、疫苗接種意願、個人文化價值觀、說服訴求、健康促進