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Cross-Country Comparison of Effects of Early Government Communication on Personal Empowerment during the COVID-19 Pandemic in Taiwan and the United States

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ABSTRACT

In uncertain times, perceived empowerment in collective contexts can influence personal empowerment. For example, during a pandemic, such as the 2020 coronavirus pandemic, communication from the government, as long as it is effective, should fuel individual empowerment, through a five-step process. Surveys of the general public, conducted two weeks after the first reported deaths from coronavirus in Taiwan and the United States, provide data for a comparative test of this proposed moderated mediation model. These data confirm that, compared with the United States, the government in Taiwan engaged in more effective communication during these early stages, and exposure to that effective communication triggered the proposed, customized, empowering five-step process among Taiwanese but not among U.S. populations. Among Taiwanese communication recipients (cf. U.S.), the five-step mediation effect is significant, such that exposure to government information → perceived government empowerment → intrapersonal empowerment → preventive behaviors → reduced vulnerability and worry.

Confronted with the global coronavirus pandemic and its vast uncertainty, people have sought empowerment and control. Empowerment often is defined as an internal, individual psychological state, attained through “the act or process of increasing perceptions of control in a given domain” (Menon, 2002, p. 29), but it also can appear at a community level, and both forms are relevant for helping people gain mastery over key issues, including their health (Rissel, 1994). Cattaneo and Chapman (2010) propose an empowerment model with six components that describes an iterative, empowerment-seeking process of pursuing *goals*, taking *actions*, and exerting *impacts*. During this process, people enter psychological states reflecting their *efficacy*, *knowledge*, and *competence*. According to this model, individual empowerment can be facilitated or inhibited by collective empowerment. Therefore, both individuals and their collective context (e.g., communities, governments) must be empowered to ensure well-being and health. Empirical tests of this model are lacking though, and prior research has not sufficiently specified the components of collective empowerment. To address these gaps, the current study leverages the notion that perceived community empowerment can enhance individual empowerment. It also takes a comparative approach, reflecting on individual citizen perceptions of the empowerment enabled by governments during the coronavirus pandemic, in Taiwan and the United States.

When the COVID-19 virus first broke, governments across the world adopted different strategies, which are effectively represented by Taiwan and the United States. In terms of mitigation and containment, the former adopted proactive strategies, whereas the latter was reactive. In terms of communication, Taiwanese

government officials held daily conferences, established direct communication channels, and warned people about the severity of the threat; in the United States, representatives did not actively engage in those behaviors. By June 1, Taiwan confirmed 558 COVID-19 cases (.0024% of the population) and 7 deaths (.00003% of the population),¹ while the United States had 9,590,495 confirmed cases (2.89% of the population) and 236,921 deaths (.07% of the population). The number of confirmed cases in Taiwan represents a notable divergence from a prediction by Johns Hopkins University that it would suffer the second most coronavirus cases, due to its geographical proximity to China and frequent exchanges across the Taiwan Strait (Gardner et al., 2020).

The contrasting mitigation and communication strategies adopted by these two governments provides a meaningful, real-world setting in which to test the proposition that individual empowerment depends on perceptions of government empowerment. Government communications likely trigger empowering processes if the government adopts appropriate mitigation measures, then effectively communicates those efforts to the public. During the earliest stage of the outbreak, Taiwan’s government engaged in more effective communication, which enhanced people’s perception that it was empowered and able to mitigate the risk of the pandemic. In turn, they likely developed stronger senses of individual empowerment. If people learn that government agencies are dedicated to containing risk and minimizing the spread of infection, then see evidence of their demonstrated efficacy and expertise, they should feel empowered, as well as more eager or willing to adopt preventive measures. Such efforts in turn should cause them to feel less vulnerable and experience less

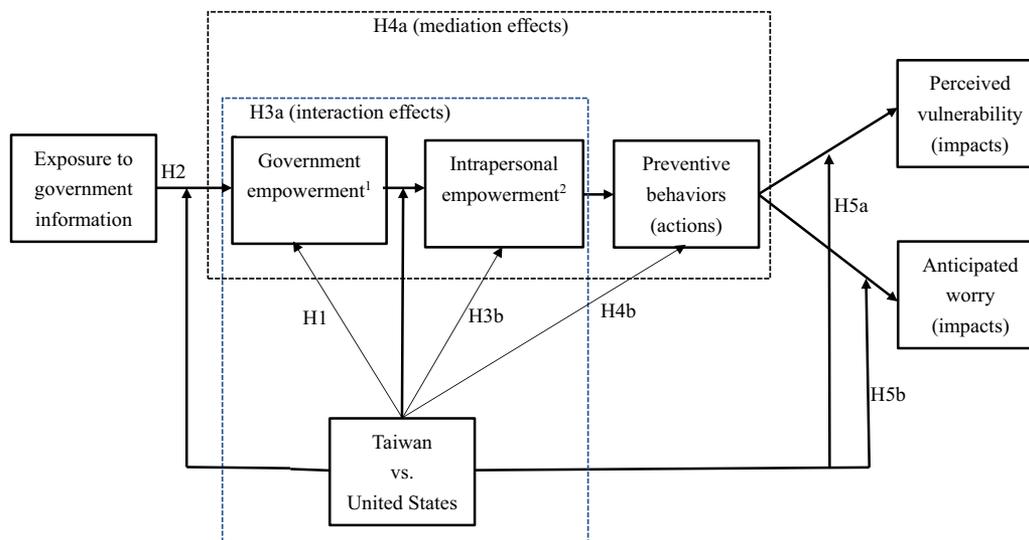


Figure 1. Proposed Model. ¹Government empowerment includes all six components. ²Intrapersonal empowerment includes four components: goals, efficacy, knowledge and competency.

worry. The proposed mediating effect in Figure 1 thus is moderated by government performance. Surveys conducted in both Taiwan and the United States, each exactly two weeks after the first death in that country was reported in the news media (i.e., March 2 in Taiwan and March 16 in the United States), provide both novel insights and evidence in support of these predictions.

Coronavirus outbreaks

The coronavirus pandemic continues to develop dynamically, so this section refers explicitly to the early stages of the pandemic, prior to the survey data collection in each country.

Taiwan² (from outbreak in Wuhan to March 2)

Perhaps due to Taiwan's previous experience with severe acute respiratory syndrome (SARS), the government immediately identified coronavirus as a serious threat and took prompt action. On January 20, one day before Taiwan reported its first confirmed case, it established the Central Epidemic Command Center (CECC) to take charge of combating any possible outbreak of the novel virus. The government then expanded border control measures to bar all travelers from China, Hong Kong, and Macau. In its containment efforts, the CECC traces and tests anyone who has come into close contact with a confirmed case.

United States³ (from outbreak in Wuhan to March 16)

The first confirmed U.S. case appeared on January 21. The Trump Administration established the White House Coronavirus Task Force on January 29, declared a public health emergency on January 31, and denied entry to foreign nationals traveling from China on February 2. No expansive testing or tracing was conducted.⁴ It was not until March 16

(also the week of the survey) that it recommended social distancing as a nationwide mitigation strategy.

Empowerment processes

Empowerment is a transformative process. In Cattaneo and Chapman's (2010) model of its basic components, the process of empowering is iterative and associated with "gaining power," such that "a person who lacks power seeks a personally meaningful goal oriented toward increasing power, takes action toward that goal, and observes and reflects on the impact of this action, drawing on his or her evolving self-efficacy, knowledge, and competence related to the goal" (p. 647). In addition, they identify six components of empowerment: goals, efficacy, knowledge, competence, action, and impacts.

Efficacy, knowledge, and competence represent psychological states; they facilitate goal materialization. *Self-efficacy* refers to "individuals' sense of agency – the individual's belief about his or her abilities" (Cattaneo & Chapman, 2010, p. 652), with a recognition that in a power-seeking process, people need to believe they are capable of exerting control. *Knowledge* is manifest in the identification of courses of action (Cattaneo & Chapman, 2010) or awareness of "how to" measures (Zimmerman, 1995). *Competence* refers to "what is required to reach a goal" (Cattaneo & Chapman, 2010, p. 653) or the skills needed to accomplish it. Whereas self-efficacy implies a subjective sense of ability or agency, competence pertains to the possession of domain-specific skills. Some people may possess the skills and competence to protect themselves (e.g., keeping distance, sanitizing, washing hands), but they might not believe they can, such that they lack self-efficacy related to preventing infection. Still, self-efficacy, knowledge, and competence often correlate.

Goals, actions, and impacts are components that facilitate goal materialization (Cattaneo & Chapman, 2010). First, an empowerment process is triggered by a meaningful goal,

which usually involves a motivation to gain the power needed to pursue a course that is meaningful and important to the individual. For this study, the ultimate goal might be avoiding infection by a deadly coronavirus. Second, if goals fuel behavioral components of the empowerment process, people take *actions*, or preventive behaviors, to achieve those desired goals. For this study, actions are any measures people take to prevent being infected. Third, *impacts* are the outcomes that follow the behaviors, including anticipated risks. To the degree that empowerment generates greater impacts, the perceived risks should be lower.

In noting the importance of both individual and broader forms of empowerment, Cattaneo and Chapman (2010) specifically postulate that social contexts exert influences on all six components of the individual empowerment process. The social or collective context in which people are situated strongly influences their empowerment process, whether by constraining or facilitating their individual efforts. This prediction echoes extant health literature. For example, Bravo et al. (2015) propose that support from healthcare systems and providers, as a broader collective context, contributes to patients' psychological empowerment. Rissel (1994) proposes that community empowerment contributes to personal empowerment and enhances health gains. With a similar view, the current study predicts that during the coronavirus outbreak, the broader context (i.e., perceived government empowerment) affects individual empowering processes.

Perceived government empowerment

An individual empowerment process involves interactions of the people undergoing the process and the surrounding context (Cattaneo & Chapman, 2010; Rissel, 1994; Zimmerman, 1995). This context component of empowerment is also psychological (Rissel, 1994). Although its precise features have not been fully specified, perceived empowerment in a collective context arguably should include the same six components that underlie the individual empowering process. That is, it might entail the perceived commitment of a relevant entity in the context (e.g., society, community, government) to collective interests, which constitutes a determination to achieve collective *goals*. Resources are important for achieving collective goals, so this conceptualization also implies an awareness of society's capability to acquire or distribute the resources required to achieve collective goals, including the *efficacy* (ability), *competence* (skills), and *knowledge* necessary to acquire, allocate, and manage resources in the environment. This contextual setting then may inhibit or enhance efforts to exert control.

Particularly during a public health crisis, such as the coronavirus pandemic, individual members of society must depend on the broader context to achieve empowerment. As a representative element of the context, this article investigates the government and its health agencies, such as the Centers for Disease Control (CDC), which represent actors that people turn to for expertise and guidance during public health crises. Perceived government empowerment for mitigating the pandemic should be relevant for empowering individual people to cope with it. On the basis of this prediction, this study

investigates the six empowerment components according to how effectively they contain or mitigate the pandemic, through resource allocation efforts. Perceived government empowerment refers to the perception that the government is determined to contain or mitigate the pandemic (*mitigation goals*), has the ability to do so (*mitigation efficacy*), possesses the expertise to achieve the goal (*mitigation knowledge*), has the skills to allocate the necessary resources and personnel (*mitigation competence*), and adopts appropriate actions to allocate those resources and deploy the personnel (*mitigation actions*). If its efforts pay off, they generate the expected *impacts*, namely, successfully mitigating and containing the pandemic.

As mentioned previously, Taiwan and the United States exhibited different mitigation and communication strategies in the early stages of the outbreak; they also differed in their resource allocations. In Taiwan, the government began manufacturing surgical facial masks and rationing their distribution to ensure every individual citizen had a sufficient supply. Following its experience with SARS, the government had mandated the availability of a substantial quantity of negative pressure care units, ventilators, and personal protective equipment (PPE) in health care facilities, in preparation for possible outbreaks of infectious diseases. In the United States in contrast, the government initially only recommended social distancing. It did not devote any substantial capacity or resources to contact tracing, testing, or equipping individual citizens with masks or healthcare workers with ventilators or PPE (Ranney et al., 2020). On the basis of these actions, it appears that in the earliest stages, Taiwan provided these resources, and therefore, it was more proactive than the United States, which likely evoked different perceptions of empowerment among citizens in each country.

H1: Perceived *government empowerment* is higher in Taiwan than in the United States.

Sources of perceived governmental empowerment: Government communication

When individual consumers seek health information from the media, they transform into active, empowered participants (Chang, 2020). Acquiring relevant information (Van Udenkraan et al., 2008) and becoming informed (Barak, Boniel-Nissim & Suler, 2008) both facilitate personal empowerment processes, because when people have access to relevant information, they can better understand what they are facing and which coping strategies are available to them.

Similarly, people seek to acquire information to assess empowerment at the government level through a wide variety of channels, though the question of whether exposure to these sources of information helps shape people's perceptions of government empowerment is not clear. Some sources, such as television news, current affairs talk shows, and online news or social media, are not under direct government control, but others are. For clarity, this study focuses on communication controlled by the government, with the argument that effective government communication offers the potential to enhance perceived government empowerment.

To be effective, communication must feature efficient channels, useful content, and trustworthy sources (Freimuth et al., 2000). In terms of *efficient channels*, since Taiwan's first confirmed case on January 21, the CECC has held daily press briefings to communicate directly to the general public, as well as the press.⁵ These briefings are covered by nearly every news channel and streamed live on both Line, Taiwan's most popular instant messaging app, which achieved an 81.31% penetration rate in 2018 (Chang & Tao, 2019), and YouTube, which had a penetration rate of 77.20% in 2019 (Chang & Tao, 2020). The CECC also opened an official account on Line to offer daily updates to its 2,172,594 subscribers (9.14% of the population) (Line official account, n.d.). In contrast, the Trump Administration only began hosting regular press conferences on March 13,⁶ 52 days after the first confirmed case and 2 days before the survey for this study was conducted.

In terms of *useful content*, the press briefings and updates on Line provide detailed information, including up-to-date statistics on the number of cases in Taiwan, actions taken by the government in terms of tracing and testing suspected cases (though the victims remain anonymous), where infected people visited prior to diagnosis, which forms of public transportation they used, and who should be on alert for symptoms or shelter at home. In contrast, Trump's press conferences have drawn widespread criticism, mostly centered on his efforts to downplay the severity of the virus, as well as the misleading and false information he issued about various topics, such as testing availability.⁷

As *trustworthy sources*, the press briefings in Taiwan are chaired by Dr. Shih-chung Chen, the charismatic director of the CECC who has an overwhelming 91% support rate,⁸ indicating that his popularity crosses party divides. In contrast, a larger proportion of the U.S. population disapproves of Trump's handling of the pandemic than approves of it,⁹ and partisan divides have been prominent in the responses by politicians,¹⁰ critics, the media, and citizens.

Overall then, exposure to direct communication from the government, whether the CDC or a coronavirus task force, has the potential to boost people's perceptions of governmental empowerment. Exposure to useful, timely information from trustworthy sources likely enhances perceptions that the government is determined to protect its citizens and has the ability, expertise, and skills to do so. Varying communication effectiveness across nations suggests that the relationship between exposure to information, directly transmitted by the government, and perceived governmental empowerment is moderated at the country level, such that it may be more likely in Taiwan, where the government has effectively communicated with the public. Accordingly,

H2: Direct exposure to government information is positively associated with perceived government empowerment to a greater degree in Taiwan than in the United States.

Outcomes of governmental empowerment

This study explores whether perceived governmental empowerment fuels people's individual process of empowerment, as

commonly postulated by empowerment (Cattaneo & Chapman, 2010; Rissel, 1994; Zimmerman, 1995) and health care (Bravo et al., 2015; Rissel, 1994) scholars, a claim for which there is scant evidence. Of the six components of individual empowerment processes (Cattaneo & Chapman, 2010), this article focuses on the intrapersonal (i.e., goal setting, efficacy, knowledge, and competence), behavioral (i.e., actions), and outcome (i.e., impacts) components separately. In particular, it explores the impact of perceptions of government empowerment on the processes by which individual people become empowered in relation to intrapersonal psychological states, behaviors, and anticipated outcomes.

Intrapersonal empowerment

Although perceptions of government empowerment have the potential to boost individual psychological empowerment, the effect may depend on the context. Specifically, the effect is more likely in contexts in which perceived government empowerment is sufficiently high (i.e., Taiwan) than in those in which it is comparatively low (i.e., United States).

H3a: Perceived government empowerment boosts intrapersonal empowerment among people in Taiwan to a greater degree than among those in the United States.

If people in Taiwan perceive greater government empowerment, they also should experience greater intrapersonal empowerment, compared with people in the United States.

H3b: People in Taiwan experience greater intrapersonal empowerment than people in the United States.

Preventive behaviors

The empowering process always involves action, such as community involvement, participation, or coping behaviors (Cattaneo & Chapman, 2010; Zimmerman, 1995). For this study context, the focal actions are associated with preventing infection, such as washing hands, social distancing, wearing masks, and avoiding social gatherings. To the degree that people are psychologically empowered (determined not to become infected, perceive that they possess sufficient efficacy, knowledge, and competence), they are more likely to engage in relevant preventive behaviors.

H4a: Government empowerment boosts preventive behaviors through intrapersonal empowerment.

If, compared with Americans, Taiwanese people believe that the government is more empowered and therefore sense their own greater empowerment, they likely engage in more preventive behaviors.

H4b: People in Taiwan engage in more preventive behaviors than those in the United States.

Anticipated impacts

For an individual empowering process to achieve the desired impact, the level of government empowerment is important; according to Cattaneo and Chapman (2010), the influence of

the context is most starkly apparent for the impact component. In a pandemic context, impact refers to reduced risks. If actions generate these impacts, people should perceive less risk, though that outcome is not guaranteed. If the government displays high empowerment, people may feel less vulnerable after taking action, but in a country marked by low governmental empowerment, people may recognize that their actions cannot necessarily reduce their sense of risk. The perception of reduced risks might provide an indicator of anticipated impacts.

Perceived risks can be cognitive or affective (Ferrer et al., 2013; Leppin & Aro, 2009; Moser et al., 2007). The former refers to vulnerability, such as a likelihood of becoming infected, and the latter refers to the degree of worry. They might act independently (Magnan et al., 2009) or simultaneously; that is, in some cases, only perceived vulnerability (Hall et al., 2009; Tang & Wong, 2004) or worry (Magnan et al., 2009) prompts preventive behaviors, but in other cases, both of them reveal links to such behaviors (Brug et al., 2004).

Furthermore, preventative behaviors may seem likely to stem from perceived risks, but some research indicates a negative relationship (Ferrer et al., 2016). Such contradictory evidence suggests the need for a more detailed analysis; accordingly, this article proposes the effects may depend on perceived empowerment. A sense of empowerment might represent a psychological adaptation, adopted by people trying to cope with threatening circumstances. Through empowerment, they arguably gain a belief that they can and thereby engage in preventive behaviors; it also could reduce their risk perceptions, in the form of both perceived vulnerability and worry. During the rapidly developing coronavirus pandemic, preventive behaviors also could have generated the anticipated impacts, reflecting an empowering process triggered by effective government communication. Therefore, it is relevant to address possible outcomes, as perceived by people in the United States and Taiwan: the likelihood of becoming infected and how worried they anticipate being in the near future.

H5: In Taiwan, but not in the United States, government empowerment reduces the (a) anticipated likelihood of getting infected and (b) anticipated worry, through its influence on intrapersonal empowerment and actions taken.

Together, these hypotheses constitute the moderated mediation model proposed in Figure 1; for comprehensiveness, the analyses reported subsequently also include tests of a full model.

Methodology

Time for surveys

Surveys were conducted in Taiwan and the United States, two weeks after the first death from coronavirus was reported in the news in each country. In Taiwan, the first case was detected on January 21, 2020, and the first death occurred and was reported on February 15. Therefore, the survey was conducted in the week beginning March 2. In the United States, the first case was diagnosed on January 21, 2020, and

the first death happened on February 26, reported in the news media three days later. This survey was conducted in the week beginning March 16.

Survey in Taiwan

Mode and participants

In Taiwan, the telephone survey involved random digital dialing, seeking people over 18 years of age with local registration. Taiwan consists of 6 municipalities, 13 counties, and 3 cities, each with a different area code. Using the area code, the sample drawn from each was proportional to that county's or city's population size. In total, 1,068 respondents completed the survey, a response rate of 54.50%. Men accounted for 48.4% of the sample. The age range was 18–88 years, with an average age of 46.41 years (SD = 16.01), distributed as follows: 18–30 (19.31%), 31–40 (18.65%), 41–50 (19.64%), 51–60 (19.08%), and 61 and older (23.32%). The distribution of educational levels included 12th grade or below (14.44%), high school (29.21%), college (13.01%), university (35.21%), and graduate school (8.15%); that is, most respondents had at least a high school education.

Data weighting

Checking the distributions of gender, age, and location, then weighting the data in accordance with these characteristics, is necessary for three main reasons. First, women tend to be more proactive in terms of health-related preventive behaviors (Lonnquist et al., 1992). Second, older people may be more vulnerable to the coronavirus infection. Third, in both countries, the pandemic is more serious in certain regional areas. The sample distribution, in terms of gender, age, and county, does not differ significantly from that of the overall population,¹¹ but the data were still weighted, to ensure they were as close as possible to the population.¹²

Survey in the United States

Mode and participants

For the U.S. survey, this study recruited workers from Amazon's Mechanical Turk (MTurk) crowdsourcing platform, who live in and have U.S. nationality. In total, 1,040 qualified respondents completed the survey.¹³ Men accounted for 50.96% of the sample. The age range was 18–88 years, with an average of 41.05 years (SD = 13.00) and the following distribution: 18–30 (23.56%), 31–40 (32.98%), 41–50 (19.62%), 51–60 (13.56%), and 61 and older (10.29%). Most respondents had at least high school education, distributed as 12th grade or below (.57%), high school (26.92%), college (13.18%), university (42.27%), and graduate school (17.06%).

Data weighting

The gender distribution in the U.S. sample did not differ significantly from that of the population,¹⁴ but the age and region (grouped into nine regions¹⁵) did, so the data were weighted. For the analyses that combine the weighted data sets in the two countries, they also were adjusted for the sample size in each country.¹⁶

Measures

Demographics

Respondents indicated their gender (male = 1, female = 0), age, education levels (1 = 12th grade or lower; 2 = high school; 3 = college or associate school; 4 = university; 5 = graduate school), and state/county or city where they reside.

Government empowerment

Perceived governmental empowerment in the government was measured by six items (Cronbach's $\alpha = .93$), one for each component. With regard to the *mitigation goal*, respondents were asked, "In your opinion, how strong is your government's will (determination) to prevent COVID-19 (coronavirus) from spreading further?" with responses ranging from 1 = "very weak" to 5 = "very strong." For *mitigation efficacy*, the item asked, "To what degree do you believe that the U.S./Taiwan government is capable of containing the COVID-19 (coronavirus) outbreak?" with responses ranging from 1 = "strongly disbelieve" to 5 = "strongly believe." The remaining questions used agreement scales, ranging from 1 = "strongly disagree" to 5 = "strongly agree." The question for *mitigation knowledge* asked, "To what extent do you agree that governmental disease control personnel are acting in a professional manner?" For *mitigation competence*, the question was, "To what extent do you agree that the government is competent in allocating the necessary personnel and resources to combat COVID-19 (coronavirus)?" Regarding *mitigation actions*, respondents indicated, "To what extent do you agree that the government has taken the right measures in their effort to combat COVID-19 (coronavirus) up to this point?" Finally, because the pandemic was still developing rapidly and the outcome remained uncertain while the surveys were being conducted, the survey also probed *anticipated impacts* of mitigation, using the item, "To what extent do you agree that the government will mitigate the COVID-19 (coronavirus) outbreak in the US/Taiwan?"

Information exposure

The survey measures information exposure according to the degree to which different channels provided information during the pandemic. On a scale from never (1) to always (4), respondents rated the degree to which they obtained information about the coronavirus pandemic from each source. The specific questions asked, "How often do you get information about COVID-19 (coronavirus) from TV news/talk shows/online news/messages your friends post or send you on Facebook, Line, Twitter or other social media/the [U.S. or Taiwan] government, Centers for Disease Control (CDC) or the Coronavirus Task Force or CDCC?"

Personal empowerment

As established previously, *goal setting*, *efficacy*, *knowledge*, and *competence* form the intrapersonal component; *action* is the behavioral component; and anticipated *impacts* constitute the anticipated outcome component.

Intrapersonal empowerment. This measure used four questions, one each for goal, efficacy, knowledge, and competence (Cronbach's $\alpha = .75$). Specifically, for *prevention goal setting*,

respondents were asked, "How strong is your own will (determination) to protect yourself from COVID-19 (coronavirus) infection?" with responses ranging from 1 = "very weak" to 5 = "very strong." With regard to *prevention efficacy*, respondents noted, "To what degree do you believe that you are able to protect yourself from being infected by COVID-19 (coronavirus)?" with responses ranging from 1 = "strongly disbelieve" to 5 = "strongly believe." With two agreement scales, where 1 = "strongly disagree" and 5 = "strongly agree," respondents indicated their *prevention knowledge* using the item, "To what extent do you agree that you have the necessary knowledge to protect yourself from being infected by COVID-19 (coronavirus)?" and their *prevention competence* using the item, "To what extent do you agree that you have the skills to protect yourself from being infected by COVID-19 (coronavirus)?"

Behavioral component (preventive actions). For the query, "To what extent do you agree that you're taking all necessary measures to protect yourself from being infected by COVID-19 (coronavirus)?" participants answered on an agreement scale (1 = "strongly disagree" to 5 = "strongly agree"). They also indicated the preventive behaviors in which they engaged.

Outcome component (anticipated impacts). Two questions tap anticipated impacts, one for the cognitive aspect (perceived vulnerability) and one for the affective aspect (anticipated worry). That is, respondents considered, "How likely do you think it is that you'll be infected by COVID-19 (coronavirus)?" with responses ranging from 1 = "very unlikely" to 5 = "likely," and "How worried will you be about the COVID-19 (coronavirus) outbreak a week from today?" with responses ranging from 1 = "not worried at all" to 5 = "very worried."

Perceptions of the infection

Health communication literature about infectious diseases demonstrates the importance of other individual differences, such as perceptions of *severity* (Chang, 2012) and *uncertainty* (Rubin et al., 2009), as well as *issue knowledge* (Ho, 2012). Thus, the respondents considered, "In your opinion, how severe is COVID-19's (coronavirus's) impact on human health?" with responses ranging from 1 = "not severe at all" to 5 = "very severe." They also indicated "To what extent do you agree that the COVID-19 (coronavirus) epidemic is unpredictable?" and "To what extent do you agree that you know a lot about COVID-19 (coronavirus)?" (both scales 1 = "strongly disagree" to 5 = "strongly agree"). It is important to measure issue knowledge and prevention knowledge as distinct constructs; they are only moderately correlated (Pearson's $r = .43$, $p < .01$ for the whole sample, Pearson's $r = .45$, $p < .01$ for Taiwan, Pearson's $r = .39$, $p < .01$ for the United States).

Results and analyses

The tests of H1, H3b, and H4b use analyses of variance (ANOVA); hierarchical regressions instead provide the tests of H2, H3a, and H4a. This study applies Hayes's (2018) Process model to test the moderated mediation predicted in H5 and the full model. The predictors were mean-centered in the regression analyses.

Hypotheses testing

In support of **H1**, which predicts higher perceptions of government empowerment in Taiwan than in the United States, the ANOVA shows that Taiwanese people perceive greater empowerment in their government (4.35, $SD = .50$) than American people (3.25, $SD = 1.00$), $F(1, 2063) = 1009.08$, $p < .01$, $\eta = .33$. The effects are similar for each component of government empowerment.

To test the effects of different sources of information on perceived government empowerment, as predicted in **H2**, the hierarchical regression analysis regresses government empowerment on four sets of predictors, in the following order: (1) demographics (gender, age, and education), (2) exposure to five types of information, (3) interaction terms (all information types by country), and (4) country. The results in **Table 1** confirm **H2**, revealing that the interaction of country and exposure to government information is significant (see also **Figure 2**); exposure to government information increases Taiwanese people's perceptions of government empowerment to a greater degree. A country-level analysis of these data, summarized in **Table 1**, reveals that exposure to information from talk shows and government are two positive predictors in Taiwan; in the United States, exposure to television news and talk shows are positive predictors, whereas online news is a negative predictor.

Similarly, to explore the effects of governmental empowerment on intrapersonal empowerment in the two countries, as predicted in **H3**, intrapersonal empowerment was regressed on five sets of predictors, in the following order: (1) demographics, (2) exposure to five types of information, (3) perceptions of the infection (virus knowledge, uncertainty, and severity), (4) government empowerment, and (5) country and its interaction with government empowerment. From **Table 2**, it is apparent that the interaction of country and government empowerment is significant; government empowerment increases Taiwanese intrapersonal empowerment to a greater degree, in support of **H3a** (see also **Figure 3**). Moreover, perceived government empowerment

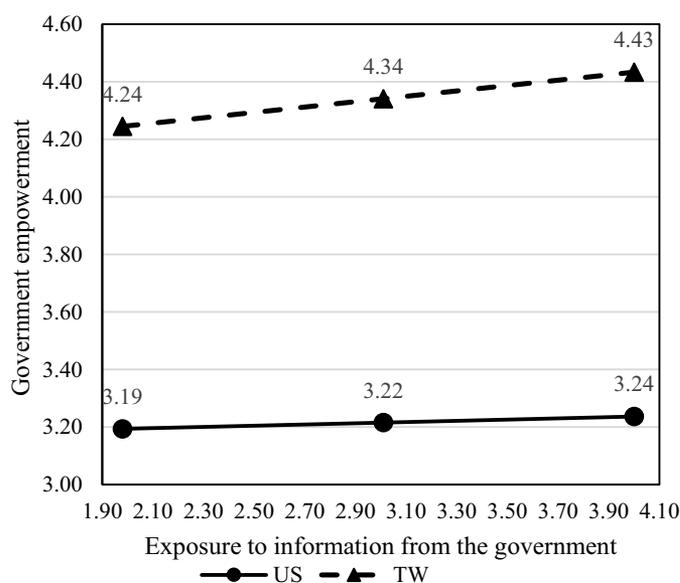


Figure 2. Effect of Exposure to Information from the Government on Perceived Government Empowerment in Taiwan and United States.

significantly increases intrapersonal empowerment. The results specific to each country are available in the online appendix, in **Table A1**. As **H3b** predicts, the ANOVA reveals that intrapersonal empowerment is greater in Taiwan (4.26, $SD = .49$) than in the United States (4.04, $SD = .60$), $F(1, 2063) = 79.84$, $p < .01$, $\eta = .04$.

For the test of **H4**, preventive behaviors were regressed on six sets of predictors in the following order: (1) demographics, (2) exposure to five types of information, (3) perceptions of the infection (virus knowledge, uncertainty, and severity), (4) government empowerment, (5) intrapersonal empowerment, and (6) country and its interaction with intrapersonal empowerment. In **Table 2**, government empowerment significantly predicts preventive behaviors ($\beta = .20$, $t = 8.45$, $p < .01$). However, adding intrapersonal empowerment to the equation reduces the influence

Table 1. Hierarchical Multiple Analyses Predicting Government Empowerment.

Predictor	Taiwan & U.S.			Taiwan			U.S.		
	B	SE	β	B	SE	β	B	SE	β
Step 1 ΔR^2 ^b			.05***			.01*			.05***
Gender ^a	.05	.04	.03	-.02	.03	-.02	.15	.06	.08**
Age	<.01	.00	.07**	<.01	<.01	.03	.01	<.01	.22***
Education	-.17	.02	-.20***	-.03	.01	-.07*	-.05	.04	-.04
Step 2 ΔR^2 ^b			.21***			.07***			.12***
TV news (TV)	.19	.02	.20***	.04	.02	.05	.06	.03	.07*
Talk shows (TS)	.23	.02	.27***	.05	.02	.11***	.23	.03	.21***
Online news (ON)	-.10	.02	-.09***	<.01	.02	<.01	-.17	.04	-.12***
Social media (SM)	.05	.02	.06**	<-.01	.02	-.02	.04	.03	.04
Info. from the government (GI)	.01	.02	.01	.08	.01	.20*** (H2)	.02	.03	.01 (H2)
Step 3 ΔR^2 ^b			.25***						
TV x Country	.04	.02	.04						
TS x Country	-.14	.02	-.15***						
ON x Country	.14	.02	.13***						
SM x Country	<.01	.02	<.01						
GI x Country	.04	.02	.05* (H2)						
Step 4 ΔR^2 ^b			.40***						
Country ^b	.46	.02	.48*** (H1)						

* $p < .05$. ** $p < .01$. *** $p < .001$.

^aMen were coded 1, and women were coded 0.

^bTaiwan was coded 1, and the United States was coded - 1.

Table 2. Hierarchical Multiple Analyses Predicting Intrapersonal Empowerment.

Predictor	Intrapersonal Empowerment			Preventive Behaviors		
	B	SE	β	B	SE	β
Step 1 ΔR^2 ^b		.02***			.02***	
Gender ^a	.06	.02	.05**	.10	.03	.07***
Age	<.01	<.01	.13***	.01	<.01	.11***
Education	-.02	.01	-.04	-.05	.01	-.07***
Step 2 ΔR^2 ^b		.06***			.07***	
TV news	.06	.01	.11***	.11	.02	.14***
Talk shows	.04	.01	.08***	.04	.02	.06*
Online news	-.03	.02	-.04	.01	.02	.01
Social media	.02	.01	.05*	.02	.02	.03
Info. from the government	.05	.01	.08***	.07	.02	.10***
Step 3 ΔR^2 ^b		.19***			.15***	
Issue knowledge	.25	.01	.36***	.24	.02	.25***
Uncertainty perceptions	.03	.01	.06**	-.03	.02	-.03
Severity perceptions	.04	.01	.07**	.10	.02	.12***
Step 4 ΔR^2 ^b		.27***			.17***	
Government empowerment (GE)	.19	.01	.33***	.15	.02	.20***
Step 5 ΔR^2 ^b		.29***			.34***	
Country ^b	-.11	.02	-.20***			
Country x GE	.10	.02	.14*** (H3a)			
Step 5 ΔR^2 ^b						
Intrapersonal empowerment (IE)				.63	.03	.47***

* $p < .05$. ** $p < .01$. *** $p < .001$.

^aMen were coded 1, and women were coded 0.

^bTaiwan was coded 1, and the United States was coded - 1.

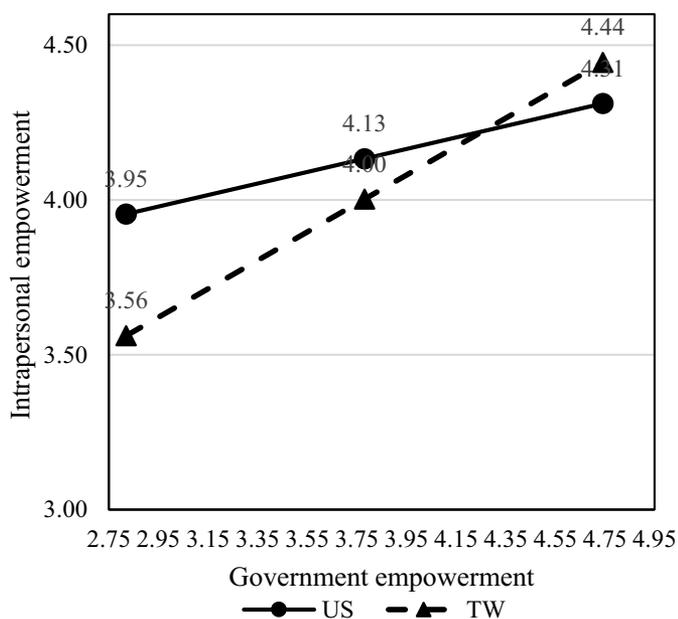


Figure 3. Effect of Perceived Government Empowerment on Intrapersonal Empowerment in Taiwan and United States.

of government power ($\beta = .04$, $t = 1.92$, $p = .06$), consistent with the predictions for the mediation effect specified in **H4a**. The country-specific results related to this prediction are in **Table A2** in the online appendix. An application of Hayes's Process model (model 4) also confirms the mediating effect, from government empowerment to preventive behaviors, through intrapersonal empowerment (confidence interval [CI]: .1384 ~ .1860). Next, in support of **H4b**, an ANOVA shows that Taiwanese respondents (4.26, $SD = .49$) engaged in more preventive behaviors than U.S. respondents (4.04, $SD = .60$), $F(1, 2063) = 45.96$, $p < .01$, $\eta = .02$. The most common preventive behaviors include washing hands regularly (96.16%), staying away from public places with

large crowds (86.91%) and from hospitals (74.72%), avoiding leaving the house (72.30%), and using alcohol wipes or solutions to sanitize surfaces (68.83%). Whereas 94.36% of Taiwanese wear masks, whereas only 9.16% of Americans do.

A customized version of Hayes's Process model macro tests the prediction in **H5** that in Taiwan, but not in the United States, government empowerment indirectly increases the anticipated impacts, (a) reduced vulnerability perceptions and (b) anticipated worry, through its influence on intrapersonal empowerment and behaviors. As **H5a** predicts, when the cognitive aspect of vulnerability is the dependent variable, the moderated mediation is significant (CI: $-.1528 \sim -.0740$). In Taiwan, the mediating effect on being vulnerable is negative and significant (CI: $-.1586 \sim -.0827$); government empowerment reduces vulnerability perceptions through its influence on intrapersonal empowerment and actions. No such effects emerge in the U.S. sample (CI: $-.0192 \sim .0034$) (see **Figure 4a** and **Table A3**). Also as **H5b** predicts, when anticipated worry is the dependent variable, the moderated mediation is significant (CI: $-.1023 \sim -.0199$). In particular, in Taiwan, the mediating effect on anticipated worry is negative and significant (CI: $-.0961 \sim -.0156$), so government empowerment also reduces anticipated worry through its influence on intrapersonal empowerment and actions. Again, no such effects emerge in the U.S. sample (CI: $-.0028 \sim .0138$) (see **Figure 4b**).

Test of the full model

Another customized version of Hayes's Process model tests the full moderated mediation model, from government communication to anticipated risks, influenced by three mediators, where country type moderates the three links, as depicted in **Figure 1**. When *perceived vulnerability* is the outcome variable, the moderated mediation is significant (CI: $-.0165 \sim -.0063$) (see **Table A4**). In Taiwan, the mediating effect is negative and significant (CI: $-.0165$

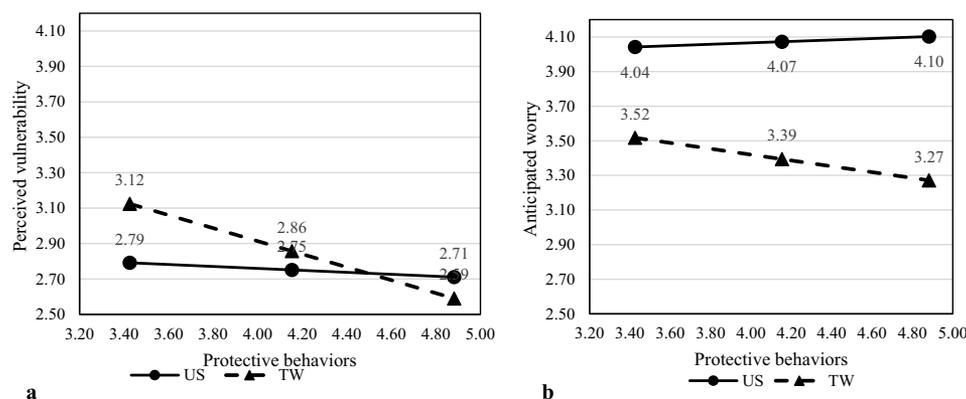


Figure 4. a. Effect of Preventive Behaviors on Perceived Vulnerability in Taiwan and United States. b. Effect of Preventive Behaviors on Anticipated Worry in Taiwan and United States.

$\sim -.0064$), suggesting that direct communication from the government triggers an empowering process that leads to reduced vulnerability. No such effects emerge in the United States (CI: $-.0008 \sim .0004$). When *anticipated worry* is the outcome variable, the moderated mediation also is significant (CI: $-.0096 \sim -.0009$). In Taiwan, the mediating effect is negative and significant (CI: $-.0093 \sim -.0007$), so direct communication from the government initiates the empowering process and reduces anticipated worry through the influence of government empowerment, intrapersonal empowerment, and behaviors. Again, no effects emerge in the U.S. sample (CI: $-.0005 \sim .0011$).

General discussion

Findings

People have an inherent need to control their health (Chang & Tao, 2019), but seeking empowerment may be especially important and meaningful when they confront events like the novel coronavirus pandemic, with its strong associations with risk, uncertainty, and death. The process of seeking personal empowerment in this situation can be effectively facilitated by perceptions of governmental empowerment. The findings suggest this effect is stronger among Taiwanese people, who perceive greater empowerment linked to their government than Americans do. This study accordingly extends extant literature in two important ways. First, it offers direct evidence in support of common propositions put forward by empowerment scholars, namely, that perceived empowerment in a broader context affects individuals' personal empowerment (e.g., Cattaneo & Chapman, 2010; Rissel, 1994; Zimmerman, 1995). Second, the results suggest that individual efforts may not be sufficient to battle a health pandemic. Popular models of health communication, such as the health belief or reasoned actions model, tend to focus on rational, individual choices; they may not be sufficient for the coronavirus.

The model proposed herein suggests that communication from the government has downstream consequences, affecting perceptions of government empowerment, which then influence intrapersonal empowerment, leading to preventive behavior, which ultimately can result in lower perceived vulnerability and anticipated worry. However, the mediation process is significantly moderated by the country; it is

significant among people in Taiwan but not people in the United States. Without the “fuel” of effective communication from their government, U.S. respondents do not feel less vulnerable or expect to be less worried simply because they engage in preventive behaviors. These findings echo prior research that suggests the importance of effective communication in a pandemic (Holmes, 2008). The battle is not merely a matter of who can better contain the outbreak; it will be won by actors that communicate better with the public.

Prior research has noted how traditional news media can spread health communication during pandemics, such as SARS in 2003 (Berry et al., 2007) or H1N1 in 2009 (Chang, 2012). New media channels make it increasingly possible for governments to communicate directly with the public, through social media (e.g., Facebook), instant messaging (e.g., Line, WhatsApp), and video sharing platforms (e.g., YouTube). Governments thus can establish direct, real-time communication channels, over which they can maintain more control in terms of what information is delivered and when, with less potential distortion by popular (and potentially polarized) media. Taiwan's government has made better use of such new media in the early stage of the pandemic, compared with the U.S. government, which may explain why exposure to information from the government enhanced perceptions of government empowerment and intrapersonal empowerment in Taiwan but not in the United States.

Further research directions

As the pandemic continues to develop, local leaders may take on more important roles; for example, Governor Andrew Cuomo of New York started holding press briefings about the pandemic on March 2, when New York State reported its first confirmed case. As the pandemic began to hit the state harder, such that it came to report the most cases and fatalities in the United States, he increased the frequency of his briefings to almost daily,¹⁷ and they were covered live by some major news channels. Cuomo's briefings provide substantial numbers and statistics, as well as moving anecdotes, giving viewers a sense of comfort and earning him substantial praise and support,¹⁸ including record high popularity levels in polls.¹⁹ That is, people may be empowered by local leaders,

even if the national government is not providing sufficient support, which may boost their sense of empowerment. Continued research should explore different layers or sources of collective empowerment.

To clarify effective communication, continued research also might analyze the content or strategies of government communication across countries. Trust in the source and fairness perceptions can be important in communications about risks (Lofstedt, 2003). Differences in political leaders' communication styles, even within the same country, also might be relevant. For example, President Trump's communication with the public is notably different in its content, tone, and approach from that of Governor Cuomo; these differences in turn might affect the degree of empowerment or solace evoked by these two U.S. politicians.

Constant changes in government messages also may provoke added uncertainty, on top of the uncertainty created by the pandemic itself, and thereby further reduce perceptions of government empowerment. For example, behavioral guidance has been consistent in Taiwan, repeatedly emphasizing the importance of wearing masks. By prioritizing and rationing masks carefully, it also helped boost people's sense of protection and alleviated their anxiety. In the United States instead, the government changed its guidelines on masks, not recommending them on February 28,²⁰ then recommending them as of April 3. Research should explore whether consistency in government communication determines whether people facing uncertainty become empowered. Moreover, the pandemic became a political topic in the United States when the Trump Administration threatened "withholding aid to Democratic state governments, while stepping it up for Republican ones."²¹ Such controversies may produce weaker perceptions of governmental empowerment, which deserves research attention.

The current findings suggest that when people feel more empowered (i.e., Taiwanese), their preventive behaviors are negatively associated with their perceived vulnerability, whereas when they feel less empowered (i.e., Americans), their preventive behaviors are positively associated with this perception of vulnerability. Prior risk literature offers several hypotheses to explain the various links identified between perceived risks and preventive behaviors. In particular, the behavior motivation hypothesis suggests "perceptions of personal risks cause people to take protective actions"; the risk reappraisal hypothesis refers to the idea that "when people take actions thought to be effective, they lower their risk perception"; and the accuracy hypothesis postulates that "risk perceptions accurately reflect risk behaviors" (Brewer et al., 2004, p. 125). In exploring actions already taken, this study resonates with the risk reappraisal hypothesis, which suggests a negative relationship, yet that outcome does not emerge from the U.S. sample. Therefore, further research should test the risk appraisal hypothesis in different contexts and with the consideration of additional moderators.

Regarding the influence of government empowerment on perceived risks, through intrapersonal empowerment and prevention behaviors, Kasperson and Kasperson (1996) suggest that, in addition to media and government, social contexts affect how people perceive risks. This claim reflects the theory of planned behavior (Ajzen, 1985), in that social norms should

determine whether people adopt advocated behaviors. Along these lines, more research is needed to explore whether social contexts might boost people's sense of empowerment. Arguably, people may feel empowered during a pandemic if relevant others express their sense of control, capabilities, and knowledge, but this claim requires confirmation.

Beyond their distinct responses to COVID-19, Taiwan and the United States also differ in cultural values. For example, Taiwanese people tend to be oriented toward collectivism, whereas Americans are individualistic (Hofstede, 1991). People in East Asia express interdependent self-construals, in contrast with U.S. people's independent self-construals (Singelis, 1994). A collectivist view and interdependent self-construal may increase the impact of empowerment at collective levels, affecting these individuals more than it does people who cherish individualism or have independent self-construals. Further research should explore if collective empowerment matters to different degrees in cultures with different value orientations and self-construals.

Limitations

It was difficult to arrange a telephone survey of a representative sample of the general public in the United States at the moment two weeks after the first coronavirus death had been reported, which is why the U.S. survey was conducted among MTurk workers. Recruiting through MTurk has advantages; in particular, the data can be collected rapidly (Paolacci et al., 2010). However, debate continues regarding whether MTurk workers are representative of the U.S. population (Buhrmester et al., 2016; Thomas & Clifford, 2017). The representativeness test indicates that the gender distribution of the U.S. sample does not vary significantly from that of the population, but the regional and age distributions do. Therefore, the data were weighted before analysis. The purpose of this data collection was to test the proposed relationships among people's perceptions, not whether any certain percentage of the population holds certain perceptions, so this issue of representativeness may be of relatively less concern.

Conclusions

People in Taiwan learned collectively from their experience of the SARS epidemic in 2003. It seemingly prepared them to be on high alert for similar infections and taught the government the importance of establishing an adequate medical infrastructure, deploying personnel and resources efficiently, and communicating effectively with the public. People around the world similarly might learn from the experience of battling the coronavirus. This article highlights the consequences of effective, and ineffective, communication in the early stage of an outbreak of a disease, with the hope that these insights might help us be better prepared for the next pandemic.

Notes

1. These rates are derived from statistics reported by Worldmeter (n.d.), COVID-19 Coronavirus pandemic, retrieved from https://www.worldometers.info/coronavirus/?utm_campaign=homeAdvegas1?

2. Information about the 2020 coronavirus pandemic in Taiwan is based on the Wikipedia entry, “2020 coronavirus pandemic in Taiwan,” retrieved April 27, 2020, (https://en.wikipedia.org/w/index.php?title=2020_coronavirus_pandemic_in_Taiwan&oldid=953376470), and verified by the authors with other media sources.
3. Information about 2020 coronavirus pandemic in the United States is based on the Wikipedia entry, “2020 coronavirus pandemic in the US,” retrieved on April 27, 2020 (https://en.wikipedia.org/wiki/2020_coronavirus_pandemic_in_the_United_States), and verified by the authors with other media sources.
4. See Lipton, E., Sanger, D. E., Haberman, M., Shear, M. D., Mazzetti, M., & Barnes, J. E. (2020, April 11). He could have seen what was coming: Behind Trump’s failure on the virus. *The New York Times*. Retrieved from <https://www.nytimes.com/2020/04/11/us/politics/coronavirus-trump-response.html>
5. See Lin, H. J. (2020, April 11). 83 days after the COVID-19 pandemic hits Taiwan: Perspectives from experts on changes and directions in mitigation strategies. *The Reporter*. Retrieved from <https://www.twreporter.org/a/covid-19-taiwan-epidemic-prevention-policies-change>
6. Factbase. (n.d.). President Donald Trump – Public schedule calendar. Retrieved from <https://factba.se/topic/calendar>
7. Fact Check on CNN (<https://edition.cnn.com/specials/politics/fact-check-politics>) has details of Trump’s false claims about the coronavirus pandemic.
8. According to *Liberty Times*, March 27, 2020.
9. According to RealClear Politics. (n.d.). Public Approval of President Trump’s Handling of the Coronavirus. Retrieved from https://www.realclearpolitics.com/epolls/other/public_approval_of_president_trumps_handling_of_the_coronavirus-7088.html
10. See Gomez, M., & Halper, E. (2020, February 28). Democratic candidates tell Trump, ‘do your damn job’ on coronavirus outbreak. *Los Angeles Times*. Retrieved from <https://www.latimes.com/politics/story/2020-02-28/democratic-candidates-criticize-trump-coronavirus-response>
11. Distributions of the Taiwanese sample do not differ significantly from that of the population in terms of gender ($\chi^2 = .44 < \chi^2_{.95(1)} = 3.84, p = .51$), age ($\chi^2 = 4.85 < \chi^2_{.95(10)} = 18.31, p = .90$), or region ($\chi^2 = .38 < \chi^2_{.95(21)} = 32.67, p = .99$). After weighting, the distributions are even closer to those of the population in terms of gender ($\chi^2 = .01 < \chi^2_{.95(1)} = 3.84, p = .98$), age ($\chi^2 = .01 < \chi^2_{.95(10)} = 18.31, p = .99$), and region ($\chi^2 = .21 < \chi^2_{.95(21)} = 32.67, p = .99$).
12. The weighting formula is $W_i = \frac{N_i}{N} \times \frac{n}{n_i}$, where N indicates population size, n indicates the completed case, N_i is the number of persons in the specified category, and n_i refers to the number of completed surveys in that category.
13. There were 1,211 completed surveys but only 1,055 passed the attention checks. Of those, 13 were not U.S. nationals, and 2 did not reside in the United States. Thus, the final sample included 1,040 participants.
14. Distributions of the U.S. sample do not differ from the population in terms of gender ($\chi^2 = .11 < \chi^2_{.95(1)} = 3.84, p = .74$) but differ significantly in age ($\chi^2 = 380.19 > \chi^2_{.95(10)} = 18.31, p < .01$) and region ($\chi^2 = 22.07 > \chi^2_{.95(8)} = 15.51, p = .01$). After weighting, the distributions are close: gender ($\chi^2 = .01 < \chi^2_{.95(1)} = 3.84, p = .99$), age ($\chi^2 = .01 < \chi^2_{.95(10)} = 18.31, p = .99$), and region ($\chi^2 = .01 < \chi^2_{.95(8)} = 15.51, p = .99$).
15. States were categorized into nine categories: (1) New England, with Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont; (2) Middle Atlantic, with New Jersey, New York, and Pennsylvania; (3) East North Central, with Illinois, Indiana, Michigan, Ohio, and Wisconsin; (4) West North Central, with Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota; (5) South Atlantic, with Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia; (6) East South Central, with Alabama, Kentucky, Mississippi, and Tennessee; (7) West South Central with Arkansas, Louisiana, Oklahoma, and Texas; (8) Mountain, with Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming; and (9) Pacific, with Alaska, California, Hawaii, Oregon, and Washington.
16. The revised weights were derived by multiplying the original weights in the Taiwan survey by $n_t/(n_t+n_u)$ and the original weights in the U.S. survey by $n_u/(n_t+n_u)$, where n_u is the sample size in Taiwan and n_t is the sample size in the United States.
17. New York State Government. (n.d.). Past coronavirus briefings. Retrieved from <https://coronavirus.health.ny.gov/past-coronavirus-briefings>
18. According to NBC New York, March 30, 2020.
19. According to Siena College Research Institute. (2020, April 27). Coronavirus Pandemic Pushes Cuomo to Record High Ratings; Voters Trust Cuomo over Trump on NY Reopening 78–16%. Retrieved from <https://scri.siena.edu/2020/04/27/coronavirus-pandemic-pushes-cuomo-to-record-high-ratings-voters-trust-cuomo-over-trump-on-ny-reopening-78-16/>
20. According to CDC [@CDCgov]. (2020, February 28). CDC does not currently recommend the use of facemasks to help prevent novel #coronavirus. Take everyday preventive actions, like staying home when you are sick and washing hands with soap and water, to help slow the spread of respiratory illness. #COVID19 <https://bit.ly/37Ay6Cm> [Tweet]. Retrieved from <https://twitter.com/CDCgov/status/1233134710638825473>
21. See Marcetic, B. (2020, April 26, 2nd paragraph). The US political system is to blame for this pandemic. *Jacobin*. Retrieved from <https://www.jacobinmag.com/2020/04/bipartisanship-pandemic-coronavirus-donald-trump-democrats-republicans>

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Appendix

Table A1. Hierarchical Multiple Analyses Predicting Intrapersonal Empowerment.

Predictor	Taiwan & United States			Taiwan			United States		
	B	SE	β	B	SE	β	B	SE	β
Step 1 ΔR^2		.02***			.02***			.04***	
Gender ^a	.06	.02	.05**	.01	.03	.01	.13	.04	.11***
Age	<.01	<.01	.13***	<.01	<.01	.14***	<.01	<.01	.13***
Education	-.02	.01	-.04	-.01	.01	-.02	.07	.02	.10***
Step 2 ΔR^2		.04***			.02***			.02***	
TV news	.06	.01	.11***	.05	.02	.07*	.03	.02	.05
Talk shows	.04	.01	.08***	-.01	.02	-.02	.04	.02	.07*
Online news	-.03	.02	-.04	<.01	.02	<.01	-.01	.03	-.01
Social media	.02	.01	.05*	.01	.02	.01	.03	.02	.05
Info. from the government	.05	.01	.08***	.06	.01	.13***	.06	.02	.09***
Step 3 ΔR^2		.13***			.20***			.09***	
Issue knowledge	.25	.01	.36***	.37	.02	.46***	.20	.02	.29***
Uncertainty perceptions	.03	.01	.06**	-.02	.02	-.03	.04	.02	.08**
Severity perceptions	.04	.01	.07**	-.02	.02	-.02	.06	.02	.10***
Step 4 ΔR^2		.08***			.11***			.09***	
Government empowerment (GE)	.19	.01	.33***	.36	.03	.36***	.20	.02	.33***
Step 5 ΔR^2		.02***							
Country ^b	-.11	.02	-.20***						
Country x GE (H3a)	.10	.02	.14***						

* $p < .05$. ** $p < .01$. *** $p < .001$.^aMen were coded 1, and women were coded 0.^bTaiwan was coded 1, and the United States was coded - 1.

Table A2. Hierarchical Multiple Analyses Predicting Preventive Behaviors.

DV: Preventive behaviors	Taiwan & United States			Taiwan			United States		
	B	SE	β	B	SE	β	B	SE	β
Step 1 ΔR^2		.03***			.02***			.04***	
Gender ^a	.10	.03	.07***	-.03	.04	-.03	.25	.05	.15***
Age	.01	<.01	.11***	<.01	<.01	.11***	.01	<.01	.13***
Education	-.05	.01	-.07***	-.02	.02	-.04	-.02	.03	-.02
Step 2 ΔR^2		.05***			.02***			.05***	
TV news	.11	.02	.14***	.05	.03	.06	.10	.03	.12***
Talk shows	.04	.02	.06*	.01	.02	.01	.07	.03	.07*
Online news	.01	.02	.01	.02	.02	.04	.02	.04	.02
Social media	.02	.02	.03	<.01	.02	-.01	.03	.03	.03
Info. from the government	.07	.02	.10***	.05	.02	.10***	.14	.03	.14***
Step 3 ΔR^2		.08***			.13***			.06***	
Issue knowledge	.24	.02	.25***	.35	.03	.37***	.19	.03	.19***
Uncertainty perceptions	-.03	.02	-.03	-.01	.03	-.02	-.05	.03	-.06
Severity perceptions	.10	.02	.12***	-.01	.03	-.01	.15	.03	.16***
Step 4 ΔR^2		.03***			.06***			.03***	
Government empowerment	.15	.02	.20***	.31	.03	.27***	.16	.03	.18***
Step 5 ΔR^2		.16***			.17***			.14***	
Intrapersonal empowerment (IE)	.63	.03	.47***	.60	.03	.51***	.62	.04	.43***
Step 6 ΔR^2		<.01*							
Country ^b	-.05	.02	-.07**						
Country x IE	-.01	.03	-.01						

* $p < .05$. ** $p < .01$. *** $p < .001$.^aMen were coded 1, and women were coded 0.^bTaiwan was coded 1, and the United States was coded - 1.

Table A3. Results of Customized Process Models to Test H5.

	Model 1	Model 2
X	Government empowerment	Government empowerment
M1	Intrapersonal empowerment	Intrapersonal empowerment
M2	Preventive behaviors	Preventive behaviors
W	Countries	Countries
Y	Perceived vulnerability	Anticipated worry
R ² (outcome = Y)	.04***	.13***
	Coeff(se)	Coeff(se)
X → M1	.32(.02)***	.32(.02)***
W → M1	-.06(.02)***	-.06(.02)***
X × W → M1	.14(.02)***	.14(.02)***
M1 → M2	.70(.02)***	.70(.02)***
M2 → Y	-.21(.03)***	-.06(.03)*
W → Y	.05(.02)*	-.34(.02)***
M2 × W → Y	-.16(.03)***	-.11(.03)***
Covariates → Y		
Gender	.01(.04)	.03(.04)
Age	<.01(<.01)	<.01(<.01)
Education	-.01(.02)	<.01(.02)
	Coeff(se) [95%CI]	Coeff(se) [95%CI]
Index of moderated mediation	-.1108(.0202) [-.1528, -.0740]	-.0597(.0211) [-.1023, -.0199]
Indirect effect X → Y		
United States	-.0072(.0056) [-.0192,.0034]	.0054(.0042) [-.0028,.0138]
Taiwan	-.1180(.0195) [-.1586, -.0827]	.0543(.0207) [-.0961, -.0156]

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$.**Table A4.** Results of Customized Process Models to Test the Full Model.

	Model 3	Model 4
X	Age_In_1	Age_In_1
M1	Government empowerment	Government empowerment
M2	Intrapersonal empowerment	Intrapersonal empowerment
M3	Preventive behaviors	Preventive behaviors
W	Countries	Countries
Y	Perceived vulnerability	Anticipated worry
R ² (outcome = Y)	.03***	.10***
	Coeff(se)	Coeff(se)
X → M1	.06(.02)***	.06(.02)***
W → M1	.56(.02)***	.56(.02)***
X × W → M1	.04(.02)*	.04(.02)*
M1 → M2	.33(.02)***	.33(.02)***
W → M2	-.08(.01)***	-.08(.01)***
M1 × W → M2	.14(.02)***	.14(.02)***
M2 → M3	.72(.02)***	.72(.02)***
M3 → Y	-.19(.03)***	.04(.03)
W → Y	.07(.02)***	-.31(.02)***
M3 × W → Y	-.15(.03)***	-.11(.03)***
Covariates → Y		
Gender	.02(.04)	.04(.04)
Age	<.01(<.01)	<.01(<.01)
Education	<.01(.02)	.02(.02)
	Coeff(se) [95%CI]	Coeff(se) [95%CI]
Index of moderated mediation	-.0108(.0026) [-.0165, -.0063]	-.0047(.0022) [-.0096, -.0009]
Indirect effect X → Y		
United States	-.0001(.0003) [-.0008,.0004]	.0002(.0004) [-.0005,.0011]
Taiwan	-.0109(.0026) [-.0165, -.0064]	-.0045(.0022) [-.0093, -.0007]

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$.