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Evidence from three societies

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**The Paradoxical Effects of Institutional Trust on Risk Perception and
Risk Management in the Covid-19 Pandemic: Evidence from Three Societies**

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Abstract

Adopting the theoretical lenses of *social amplification of risk framework* and *trust paradox*, this study examines how people's attention to media information influences their risk perception and risk management behaviors (i.e., vaccination intention) in the context of the Covid-19 pandemic in three Chinese societies (i.e., Hong Kong, Taiwan, and Mainland China). A total of 9,575 valid samples were obtained via online survey panels. The results revealed that media attention significantly influenced risk perception and risk management across the three societies. Institutional trust, however, could amplify or attenuate risk perception and risk management in different societies: While institutional trust was found to have a positive impact on people's risk perception in Taiwan and Mainland China, a negative impact was discovered in Hong Kong. Moreover, different dimensions of institutional trust, which we term ability-based trust and benevolence-based trust, were found to mediate the effect of media attention on risk perception and risk management in different societies: While both dimensions were significant mediators for Taiwan, benevolence-based trust and ability-based trust was the only mediator for Mainland China and Hong Kong, respectively.

The paradoxical impact of institutional trust on risk perception and risk management is explained with contextual factors specific to each of the three societies, supplemented with *post-hoc* analysis on how publics assign risk management responsibility to risk management institutions in different societies. Overall, the results provide empirical support to the social amplification of risk framework (SARF) by highlighting the roles of media and institutions as social stations that shape risk perception.

Keywords: Institutional trust, social amplification of risk framework, Covid-19 vaccine, risk management, media attention

The Paradoxical Effects of Institutional Trust on Risk Perception and Risk Management in the Covid-19 Pandemic: Evidence from Three Societies

Introduction

In crisis and risk events, the media and various social institutions could influence people's perceptions of the risk by either amplifying or attenuating it (Kasperson et al., 1988). In the on-going Covid-19 pandemic, governments and relevant institutions around the world have played a central role in shaping the public's perception of risk and encouraging risk management behaviors. Trust in risk management institutions is argued to be a cost-effective measure that has helped both authorities and citizens battle the pandemic (Bronfman, et al., 2008). The essential roles of media and risk management institutions include delivering information about the potential risk of the disease, addressing misinformation to promote the public's accurate understanding of the virus (Y. Dai et al. 2022), and controlling the infection rate and protecting public health by recommending preventive measures and introducing mandatory controls (B. Dai et al. 2020). Information and measures from these institutions regarding disease control affect the public's understanding of the severity and controllability of the situation as well as the perceived competence of these institutions in handling the risk.

While previous research has revealed great insights on the role of institutional trust in risk perception and risk management (e.g., Kim & Song, 2017; Ye & Lyu, 2020), it has also left open several research gaps. First, previous studies are mostly situated in the contexts of natural or technological hazards such as floods, climate change, and nuclear power. More research on the role of institutional trust in risk perception in health pandemics is necessitated by the fact that the effects of institutional trust on individual preventive behaviors may vary for different types of risks. In natural or technological hazards, institutions are believed to take the main responsibility for risk management (Bichard & Kazmierczak, 2012), while for

other types of risks, such as a pandemic, individuals also shoulder substantial responsibility in protecting themselves from personal risks. Second, while previous research on institutional trust has established a positive impact of institutional trust on risk management behaviors (e.g., Kim & Song, 2017; Ye & Lyu, 2020), more recent research on risk management behaviors in the Covid-19 pandemic has observed a contrasting effect where greater trust in the government coincides with a lower intention to comply with recommended preventive behaviors (Wong & Jensen, 2020), inviting more research to settle the inconsistencies in the previous literature. Third, although institutional trust is recognized as a multi-dimensional construct in previous research, it is unclear how different dimensions of the concept play a role in risk perception and risk management due to the lack of a uniform and consistent definition of the concept across different studies. More research is called for to unpack which aspect of institutional trust plays a more important role in influencing risk perception and risk management behaviors.

With a survey conducted in Hong Kong, Taiwan, and Mainland China, the present research examines the effect of institutional trust on risk perception and risk management behaviors, with a focus on how individuals' trust toward the relevant risk management institutions mediates the effect of media information on their perception of the risk as well as their intention to take the Covid-19 vaccine. It adds to the literature on risk perception by 1) explicitly examining the effects of different dimensions of institutional trust in risk perception, 2) investigating the differential mediating role of institutional trust across three societies that differed in their government's approach to risk management and the public's designation of risk management responsibilities at the institutional and the individual level, and 3) examine the roles of media and institutional trust on risk perception across three societies that are influenced by the Confucian tradition and yet adopt different political regimes. The results clarified the differential impact of different dimensions of institutional

trust in the risk perception process as well as highlighted the paradoxical impact of institutional trust on risk management with cross-societal differences.

Literature Review

Social Amplification of Risk through Media and Risk Management Institutions

The social amplification of risk framework (SARF; Kasperson et al., 1988) explains how risks are perceived by individuals during the communication process. According to SARF, psychological, social, institutional, and cultural processes interact with information about the risk events to shape the individual and social perception of risk and their risk behaviors (Renn et al., 1992). There are two core components for the social amplification process: the social amplification stations and individual amplification stations, which can include individuals, groups, or public institutions (Renn et al., 1992). The social amplification stations exaggerate or attenuate the risk information by generating or transmitting the risk information, while individual amplification stations interpret and respond to the risk information (Kasperson et al., 1988). The amplification process begins with the recognition of adverse events. Then, individuals or groups will select specific characteristics or aspects of these events, interpret them based on their existing mental schema, and communicate their interpretations to other groups or individuals.

SARF recognizes that media serve as an important component of the social stations of amplification and play an essential role in shaping people's risk perceptions (Kasperson et al., 1989). As an essential source for risk information, media can increase individuals' exposure to risk information, and, in turn, increase the level of perceived risk (R. Liu et al. 2022; Sjöberg & Engelberg, 2010). Increased attention to risk information makes the risk more salient in people's minds and thus heightens the perception that the risk is more likely to occur (Tversky & Kahneman, 1973). Supporting this assertion, Frewer et al. (2002) found that perceived risk about genetically modified food was positively related to the media

coverage. Ng et al. (2018) discovered a positive link between social media exposure to risk information and people's perception of environmental health risks, illustrating the influence of the media's role in amplifying risk perception.

Empirical evidence has provided support to the amplification role of the media and various institutions in risk perception. Specifically, exposure to risk information through the media was found to influence people's perceptions, and, subsequently, their perceived risk of the event. Hmielowski et al. (2014) found that consuming information from media that only covered a moderate amount of content on global warming decreased trust in scientists and subsequently influenced risk perception of global warming. Z. Liu and Yang (2021) found that, attention to media coverage about vaccine scandals increased individuals' trust in the honesty of the government's dealing with the vaccine scandals, which further decreased their perceived risk of vaccine safety. Based on the literature, we predict,

H1a-b: Individuals' attention to Covid-19 information from the media influences (a) their trust toward the relevant Covid-19 risk management institutions, which further (b) influences the individual' perceived personal risk of Covid-19.

The Paradoxical Effect of Institutional Trust on Risk Perception and Risk Management

In addition to the media, another important social amplification station of risk is the public's trust in various institutions in handling potential hazards. It is recognized that an individuals' risk perception involves their perceptions of the institutions responsible for managing the risk (Frewer, 2003). The types of institutions that may play a role in shaping individuals' perceptions of risk may include non-governmental agencies, regulatory bodies, or companies (Frewer, 2003). Perception of managerial incompetence can lead to an increased perceived risk of the crisis, while beliefs in relevant institutions' commitment to the public interest and their competence in risk management can relieve people's perception of the likelihood and the severity of the risk (Wachinger et al., 2013).

Institutional trust has been found to both positively and negatively influence risk perception in previous research (Slovic, 1993). In terms of positive influence, prior research on Covid-19 infection rates found that trust in local government was positively related to the risk perception of the pandemic, which further promoted individuals' prevention behaviors and decreased the infection rate (Ye & Lyu, 2020). Another study found that trust toward the government, the Centers for Disease and Prevention (CDC), and hospitals was positively related to prevention behavioral intention (Kim & Song, 2017). Based on the previous literature and extending the predictions in H1, we predict the serial mediation hypothesis below that reflects a positive relationship between institutional trust, risk perception, and risk management behavior. Noteworthy is that H2 logically overlaps and extends the predictions made in H1 in two ways. First, H1a-b makes a non-directional prediction about institutional trust and risk perception whereas H2 predicts a *positive* relationship between the two. Second, H2 extends the causal chain further to risk management behavior, which, in the context of the present research, is reflected as the intention to take Covid-19 vaccine.

H2a-c: Individuals' attention to Covid-19 information on the media influences (a) their trust toward the relevant Covid-19 risk management institutions, which further (b) *increases* the individuals' perceived personal risk of getting Covid-19 and (c) their intention to receive the Covid-19 vaccine.

While trust toward relevant risk management institutions could *increase* risk management behaviors (Wachinger et al., 2013), heightened institutional trust could also lead people to underestimate risk and further *reduce* the public compliance with the risk measures to control the risk. In two surveys using coastal community samples, Terpstra (2011) discovered that trust could impede people's intention to prepare for flood through by both cognitively reducing citizen's perception of flood risk, and affectively lessening people's amount of dread evoked by flood risk. Another study found that people with a higher level of

trust in government perceived fewer impacts from earthquakes and had less preparedness for potential earthquakes (Han et al., 2017). In the context of the Covid-19 pandemic, a recent study in Singapore showed that the public's high trust toward the government co-occurred with a low risk perception and a low motivation to comply with the government's recommended risk management measures (Wong & Jensen, 2020). This observation, termed the *trust paradox* by the authors, speak of the paradoxical nature of institutional trust in risk perception and call for further research on how different dimensions of trust and what social and cultural factors led to it.

Dimensions of Institutional Trust and Its Relationship with Risk Perception

In further unpacking the paradoxical effect of institutional trust in risk perception, we first look into the different dimensions of intuitional trust, which was often overlooked in previous research. Early literature defines institutional trust as the willingness to be vulnerable based on the expectation that the institution will perform actions for the benefit of the trustor (Mayer et al.,1995). More recent literature acknowledges the multi-dimensional nature of institutional trust by including dimensions capturing both an institution's knowledge and skill to undertake certain tasks (e.g., expertise, ability, and competence) and its intention or motives underlying its action (e.g., benevolence, integrity, honesty, and fairness; Earle, 2010). Although the specific terms employed have varied across studies, ability and benevolence have been the most widely employed terms to represent the two core dimensions of institutional trust (e.g. Johnson, 1999; Kasperson et al., 1992; Mayer et al., 1995; Renn & Levine, 1991). Conceptually, ability-based institutional trust captures trustors' perception of the effectiveness of the institution's performance (Renn & Levine, 1991). Benevolence-based trust captures the trustor's perception of how much the institution is believed to do good for the trustors (Mayer et al., 1995).

Despite the consensus on the core dimensions of institutional trust, less is known about how the two dimensions function individually in influencing risk perception and relevant behaviors. In this regard, previous studies revealed mixed findings. A meta-analysis showed that *both* ability and benevolence were significant predictors of risk-taking behaviors (Colquitt et al., 2007), while another study found that messages that emphasized the government's *benevolence* for the public influenced people's risk perception more than messages that emphasized the government's ability (Ho et al., 2020). Given the consistent findings, we ask,

RQ1: How do benevolence- and ability-related institutional trust influence individuals' perception of personal risk?

Connecting both dimensions of institutional trust with the paradoxical effect of institutional trust on risk perception, it is argued that, from the perspective of benevolence, trust in institutions produces the expectation that the institutions will offer protections for the public. This expectation can mitigate people's uncertainty about the situation, create a sense of security, and reduce the point of preventive actions (Colquitt et al., 2012). From the perspective of ability-based institutional trust, it has been suggested that trust in institutions' competence to deal with the risk is likely to produce expectations for effective performances by the institutions to cope with a problem, which reduces the perceived likelihood and magnitude of negative outcomes and decreases the perceived necessity and importance of taking personal preventive measures. (Renn & Levine, 1991). Based on the literature, we hypothesize how both dimensions of institutional trust could be responsible for the trust paradox,

H3a-c: Individuals' attention to Covid-19 information on the media influences (a) their trust toward the relevant Covid-19 risk management institutions, which further

(b) *decreases* the individual's perceived personal risk of getting Covid-19 and (c) their intention to receive the Covid-19 vaccine.

Another possible attribution of the trust paradox, to which Wong and Jensen (2020) allude, is the varying roles of institutions in risk management across different societies. In some societies, trust in institutions *hinders* the public's compliance with risk management measures because people trust that the authorities will protect them from being negatively affected (Han et al., 2017). In other cases, trust in institutions *increase* people's perception of risk and promote risk management behaviors because people trust the information from the institutions about the susceptibility and severity of the diseases and thus have a propensity to follow the institutions' advice (Ye & Lyu, 2020).

Although Hong Kong, Mainland China, and Taiwan share a common Confucius and collectivistic cultural root (Triandis 2001), there are major differences in their political systems due to their distinctive political transformations. Hong Kong was under British colonization from 1842 to 1997. Today, as a special administrative region of China, Hong Kong is governed by the Chinese government under the "one country, two systems principle, which ensures the separation of powers among the executive, legislative, and judicial branches. Under Hong Kong's Basic Law, the Hong Kong government operates with a certain degree of administrative autonomy. The society also embraces financial independence and freedom of the press, expression, and assembly more than Mainland China (Gittings, 2013). Taiwan was under the Japanese colonization for half a century before it was incorporated into the Republic of China in 1945. Politically, it currently adopts a democratic electoral system featuring competitions among rival political parties (Shi, 2001). Mainland China reflects an authoritarian political regime governed by the Chinese Communist Party. Because of government censorship, freedom of expression is limited in public spaces,

including the Internet, and the media reporting is often influenced by state policies (Li 2004; Lu et al. 2021).

The difference in the political regimes in the three societies also have brought different cultural values in the relationship between the state and its people. In Mainland China, the government-citizen relationship is often regarded as hierarchical. People tend to honor decisions of the political leaders, cooperate with the government, and sacrifice personal interests for the collective well-being of the society (Hsin-Chi & Siu-Kai, 2002; Shi, 2001). In Taiwan and Hong Kong, where individualism and the demand for autonomy are more valued because of the historical influences from Western cultures, the relationship between the government and the citizens is perceived as more reciprocal and egalitarian. People are more comfortable with the idea of assessing the government based on its performance and achievement and are more open to expressing dissatisfactions when their expectations are not met. To examine the effects of institutional trust on compliance with risk management behaviors across different societies, we ask,

RQ2: How do the relationships among media attention, institutional trust, risk perception, and risk management behaviors specified in H1 and H2 differ in Hong Kong, Taiwan, and Mainland China?

Method

Data Collection Procedure

From August 2020 to January 2021, online surveys were conducted in the three cities. Two online survey agencies were contracted for hiring participants: Rakuten Insights for the Hong Kong and Mainland China datasets, and Chungliu Education Foundation for the Taiwan dataset because it could cover the rural areas to improve the sample representativeness. The survey platform for Hong Kong and Mainland China was Qualtrics, while SurveyCake was used for Taiwan. IRB approval was obtained before the data

collection. The response rates in Hong Kong, Taiwan, and mainland China were 58.76%, 29.37%, 31.67%. respectively.

The Hong Kong survey ran from September to October 2020 and employed stratified quota sampling that drew on the city's 2016 population census, based on the distribution of gender, age, and residence. In Taiwan, we used Random Digit Dialing (RDD) sampling from October 2020 to January 2021 based on the Taiwan 2020 household registration database. To account for mainland China's large population, we first employed Probabilities Proportional to Size (PPS) sampling to identify the targeted provinces and cities, followed by stratified quota sampling with gender and age based on the 2010 Mainland population census. The Mainland survey ran from August to September 2020. A total of 9,575 valid samples were obtained (Hong Kong: $n = 3,188$; Taiwan: $n = 3,000$; Mainland China: $n = 3,387$).

We took two steps to ensure the validity and reliability of the questionnaire items. First, to establish that the original English questions were correctly conveyed in Chinese, we performed a back-translation (Brislin, 1970). Second, we pretested the questionnaires with ten students in each region. The pretests' results showed that the reliability for each measure was satisfactory (Cronbach's $\alpha > 0.80$).

Because certain age groups (e.g., individuals over 50 years old) were difficult to reach, we applied post populations weights in the data analysis to adjust for the discrepancies between the sample and census data in terms of gender, age, and residence.

Sample Characteristics and Covariates

The gender distribution in the of sample was 56.6 %, 55.9%, and 51.3% female for Hong Kong, Taiwan, and Mainland China, respectively. Age was measured by a 9-point scale from 1 = under 20 to 9 = over 55 (Hong Kong: $M = 4.85$, $SD = 2.36$; Taiwan: $M = 3.89$, $SD = 1.66$; Mainland China: $M = 2.26$, $SD = .85$). Education was measured by the highest education level on a 1-7 ordinal scale with 1 = junior high school or below and 7 = doctorate

in Hong Kong and Mainland China (Hong Kong: $M = 4.00$, $SD = 1.52$; Mainland China: $M = 4.36$, $SD = 1.08$), while in Taiwan, 1-5 ordinal scale was used with 1 = junior high school or below and 5 = doctorate (Taiwan: $M = 3.05$, $SD = 0.61$). The income question asked respondents to report the monthly household income (Hong Kong: $M = 4.63$, $SD = 1.77$; for reference, 5 = 40,001HKD-50,000HKD, equivalent to US\$5,133-\$6,417; Taiwan: $M = 5.93$, $SD = 3.86$; for reference, 6 = 60,001TWD – 70,000TWD, equivalent to US\$2,164-\$2,524; Mainland China: $M = 2.99$, $SD = 1.08$; for reference, 3 = 15,000RMB-25,000RMB, equivalent to US\$2,138-\$3,563). As to the political orientation, for Hong Kong, 39.1% were apolitical and 22.9% were Democrats. For Taiwan, 17.3 % were Kuomintang and 16.1% were Democrats. For Mainland China, 62.6% were masses, 16.1% were communist youth league member, and 9.9% were communists. As for the residential areas, for Hong Kong, 50 % were from New Territories, 32.1 % were from Kowloon, and 17.5% were from Hong Kong Island. For Taiwan, the top two cities with largest number of participants were New Taipei City and Taipei City. 20% of the respondents were from New Taipei City, 14.5% were from Taipei City. For Mainland, participants were from 26 provinces or municipalities. The top three areas with the largest number of participants were Guangdong, Anhui, and Jiangsu province, accounting for 7%, 6.8 %, and 6.8% of the total number respectively. Participants' gender, age, education, income, political orientation, and residential area are included in the analysis as covariates.

Measures

Media Attention

We measured media attention by asking participants how often they paid attention to information about Covid-19 through media channels including television, newspapers, websites, social media, and short video platforms. Responses were measured on a 7-point scale (1 = never; 7 = always; $M = 3.97$, $SD = 1.16$; Drew & Weaver, 1990).

Institutional Trust

We measured perceived trust in institutions' ability and benevolence in disease control and prevention on a 7-point scale ($1 =$ extremely disagree, $7 =$ extremely agree; Mayer et al., 1995; ; Huang et al. 2021). Trust in institutions' *ability* was measured by asking respondents the extent to which they agreed with the statements: (1) They are capable of performing their jobs; (2) They achieve good results; (3) Their technical skills make me confident; (4) They have much knowledge about the work that needs done; (5) They are well qualified for their jobs ($M = 4.94$, $SD = 1.29$, $\alpha = .95$). Trust in institutions' *benevolence* was measured by asking respondents the extent to which they agreed with the statements: (1) They are very concerned about my welfare; (2) They are very concerned about my needs and desires; (3) They are very concerned about what is important to me; (4) They will go out of their way to help me; (5) They would not knowingly do anything to hurt me ($M = 4.67$, $SD = 1.30$, $\alpha = .93$).

Perceived Risk

Perceived cognitive risk was measured by asking respondents the extent to which they agreed with the following statements on a 7-point scale ($1 =$ extremely disagree, $7 =$ extremely agree; Champion et al., 2008): (1) The coronavirus is almost ubiquitous and the pathogenicity is high; (2) There is a high probability of getting infected; (3) The mortality rate of Covid-19 is high; (4) I have no confidence I can avoid the negative impact of Covid-19 ($M = 4.57$, $SD = 1.13$, $\alpha = .82$).

Intention to Receive the Covid-19 Vaccine

Intention to receive the Covid-19 vaccine was measured by asking respondents the extent to which they agreed with the following statements on a 7-point scale ($1 =$ extremely disagree, $7 =$ extremely agree; Yang & Pittman, 2017): (1) I would get the vaccine sometime

soon; (2) If I were faced with the decision of whether to get the vaccine today, I would choose to get it; (3) I would get the vaccine in the future ($M = 4.44$, $SD = 1.39$, $\alpha = .85$).

Results

Data Analysis Approach

H1 was not tested in the hypothesis test as it was logically subsumed in H2 and H3. H2 and H3 predicted two serial mediation models where individuals' attention to Covid-19 information on the media influenced people's vaccination intention through institutional trust and perceived risk. The only difference is that H2 predicts a positive relationship between institutional trust and risk perception while H3 predicts a negative relationship between the two. RQ1 inquired about the difference between the ability-based dimension of institutional trust and the benevolence-based dimension of institutional trust. RQ2 asked about the differences among the three societies.

Because RQ 1 deals with the comparative strength of two dimensions of institutional trust in mediating the effect of media attention on vaccination intention, we intended to use Model 80 from Hayes' PROCESS (Hayes, 2013) to analyze the data, which allow for both dimensions to be entered as parallel mediators. Before the analysis, we checked for multicollinearity by conducting simple linear regression analyses with participants' attention to Covid-19 information on the media, trust in institutions' ability, and trust in institutions' benevolence as the independent variables and the vaccination intention as the dependent variable. The variance inflation factors (VIF) were less than 3.15, indicating multicollinearity was not a severe problem (Cohen et al., 2003). The analysis proceeded by using Model 80 from Hayes' PROCESS (Hayes, 2013). Additional control variables included participants' gender, age, education, income, residential area, and political affiliation, and the relevant results are presented in Table 1.

[Table 1 near here]

Hypothesis Testing

Hong Kong

Regression analysis. The analysis on Hong Kong revealed that participants' attention to Covid-19 information on the media (independent variable) increased their trust toward the government's *ability* to handle the pandemic (Mediator 1; $b = .20$, $SE = .02$, $t = 8.98$, $p < .001$) and their trust toward the government's *benevolence* in handling the pandemic (Mediator 2; $b = .20$, $SE = .02$, $t = 9.51$, $p < .001$). Trust in the government's *ability* (Mediator 1) significantly decreased individuals' perceived personal risk of getting the disease ($b = -.08$, $SE = .02$, $t = -3.09$, $p = .002$), while trust toward the government's *benevolence* (Mediator 2) did not significantly predict individuals' perceived personal risk of getting the disease ($b = -.01$, $SE = .03$, $t = -.40$, $p = .69$). Meanwhile, media attention ($b = .14$, $SE = .02$, $t = 6.52$, $p < .001$), trust in the government's *ability* ($b = .12$, $SE = .03$, $t = 4.03$, $p = .0001$), trust in the government's *benevolence* ($b = .34$, $SE = .03$, $t = 11.13$, $p < .001$), and perceived risk ($b = .08$, $SE = .02$, $t = 3.58$, $p = .0003$) significantly predicted vaccination intention (Dependent variable; Figure 1).

[Figure 1 near here]

Indirect and total effects of media attention through ability and benevolence. The analysis revealed that the direct effect of media attention (independent variable) on vaccination intention (dependent variable) was significant, $b = .14$, $SE = .02$, $t = 6.52$, $p < .001$, 95% CI [.10, .18]. Besides, media attention (independent variable) had a significant negative *indirect* effect on vaccination intention (dependent variable) through *ability* (Mediator 1) and perceived personal risk (Mediator 2), $b = -.001$, bootstrapped $SE = .0006$, bootstrapped 95% CI [-.002, -.0002]. However, media attention (independent variable) did not have a significant indirect effect on vaccination intention (dependent variable) through *benevolence* (Mediator 2) and perceived personal risk (Mediator 2), $b = -.0002$, bootstrapped

$SE = .0005$, bootstrapped 95% CI $[-.001, .0008]$. The total effect of media attention (independent variable) on vaccination intention (dependent variable) was significant, $b = .25$, bootstrapped $SE = .02$, bootstrapped 95% CI $[.20, .29]$ (Table 2).

As such, the results from the Hong Kong dataset supported the predictions in H3, but the trust paradox was only observed for the ability dimension of institutional trust, not for the benevolence dimension.

[Table 2 near here]

Taiwan

Regression analysis. For Taiwan, the analysis did not reveal statistical significance in the overall model: Although trust towards the relevant risk management institutions was found to influence perceived personal risk of Covid-19, the effect was not further extended to participants' vaccination intention. Participants' attention to Covid-19 information on the media (independent variable) increased their trust toward the Taiwan government's *ability* to handle the pandemic (Mediator 1; $b = .14$, $SE = .02$, $t = 6.77$, $p < .001$) and their trust toward the Taiwan government's *benevolence* in handling the pandemic (Mediator 2; $b = .16$, $SE = .02$, $t = 7.87$, $p < .001$). However, in contrast to the pattern in Hong Kong, perceived trust in the government's *ability* (Mediator 1; $b = .19$, $SE = .02$, $t = 7.71$, $p < .001$) and perceived trust in the government's *benevolence* (Mediator 2; $b = .09$, $SE = .03$, $t = 3.59$, $p = .0003$) significantly *increased* individuals' perceived personal risk of getting the disease (Mediator 3). Meanwhile, media attention ($b = .18$, $SE = .02$, $t = 8.58$, $p < .001$) and perceived trust in government's benevolence ($b = .31$, $SE = .03$, $t = 10.23$, $p < .001$) significantly predicted vaccination intention (Dependent variable; Figure 2). However, perceived personal risk of getting the disease did not predict vaccination intention ($b = .04$, $SE = .02$, $t = 1.71$, $p = .09$).

[Figure 2 near here]

Indirect and total effects of media attention through ability and benevolence. The analysis revealed that the direct effect of media attention (independent variable) on vaccination intention (dependent variable) was significant, $b = .18$, $SE = .02$, $t = 8.58$, $p < .001$, 95% CI [.14, .22]. However, media attention (independent variable) did not have a significant indirect effect on vaccination intention (dependent variable) through *ability* (Mediator 1) and perceived personal risk (Mediator 3), $b = .001$, bootstrapped $SE = .0008$, bootstrapped 95% CI [-.0004, .003]. Likewise, the indirect effect of media attention (independent variable) on vaccination intention (dependent variable) through *benevolence* (Mediator 2) and perceived personal risk (Mediator 3) was also not significant, $b = .0005$, bootstrapped $SE = .0005$, bootstrapped 95% CI [-.0002, .002]. The total effect of media attention (independent variable) on vaccination intention (dependent variable) was significant, $b = .23$, bootstrapped $SE = .02$, bootstrapped 95% CI [.19, .27] (Table 3).

As such, the data from Taiwan were consistent with H1 but not consistent with H2 or H3. Individuals' institutional trust was found to influence perceived risk of Covid-19 but it did not further influence intention to receive the Covid-19 vaccine.

[Table 3 near here]

Mainland China

Regression analysis. The analysis on Mainland China revealed the statistical significance of the individual paths and the overall model, but the direction of the effects was inconsistent with a trust paradox. Specifically, participants' attention to Covid-19 information on the media (independent variable) increased their trust toward Mainland China's government's *ability* to handle the pandemic (Mediator 1; $b = .22$, $SE = .01$, $t = 18.09$, $p < .001$) and their trust toward Mainland China's government's *benevolence* in handling the pandemic (Mediator 2; $b = .28$, $SE = .01$, $t = 23.01$, $p < .001$). Trust in government's

benevolence (Mediator 2) significantly *increased* individuals' perceived personal risk of getting Covid-19 (Mediator 3; $b = .23$, $SE = .03$, $t = 6.61$, $p < .001$). However, trust in government's *ability* (Mediator 1) did not predict individuals' perceived personal risk of getting the disease (Mediator 3; $b = -.05$, $SE = .04$, $t = -1.56$, $p = .12$). Meanwhile, media attention ($b = .19$, $SE = .01$, $t = 14.55$, $p < .001$), trust in government's *ability* ($b = .26$, $SE = .02$, $t = 10.72$, $p < .001$), trust in government's *benevolence* ($b = .30$, $SE = .02$, $t = 12.49$, $p < .001$), and perceived risk ($b = .09$, $SE = .01$, $t = 7.13$, $p < .001$) significantly predicted vaccination intention (dependent variable; Figure 3).

[Figure 3 near here]

Indirect and total effects of media attention through ability and benevolence. The analysis revealed that the direct effect of media attention (independent variable) on vaccination intention (dependent variable) was significant, $b = .19$, $SE = .01$, $t = 14.55$, $p < .001$, 95% CI [.16, .21]. However, media attention (independent variable) did not have a significant indirect effect on vaccination intention (dependent variable) through *ability* (Mediator 1) and perceived personal risk (Mediator 3), $b = -.001$, bootstrapped $SE = .0007$, bootstrapped 95% CI [-.002, .0002]. Although media attention (independent variable) had a significant indirect effect on vaccination intention (dependent variable) through *benevolence* (Mediator 2) and perceived personal risk (Mediator 3), $b = .005$, bootstrapped $SE = .001$, bootstrapped 95% CI [.003, .008], the effect was positive rather than negative, which is inconsistent with the pattern of a trust paradox. The total effect of media attention (independent variable) on vaccination intention (dependent variable) was significant, $b = .34$, bootstrapped $SE = .01$, bootstrapped 95% CI [.31, .37] (Table 4).

Thus, the data from Mainland China were partially consistent with H2, in that only benevolence dimension of institutional trust was found to increase individuals' perceived risk

of getting Covid-19 and their intention to receive the Covid-19 vaccine. The data were not consistent with H3, in that the data pattern did not reflect the trust paradox.

[Table 4 near here]

Discussion

Through lens of social amplification of risk framework (SARF; Kaspersen et al., 1988), this research examined the amplifying effects of media and trust toward risk management institutions in the risk perception and risk management process. In particular, this study investigated the paradoxical role of institutional trust in risk perception—where greater trust toward risk management institutions may increase or decrease people’s intention to manage risk at a personal level—and how different dimensions of institutional trust played a role in the process. The contrasting effects found in Taiwan, Hong Kong, and Mainland China both supported and extended the research on SARF as well as highlighted important future research directions on the potential moderators for the trust paradox.

Amplifications by Institutional Trust and Media

In all three societies, individuals’ risk perception was found to be influenced by their attention to media information and their trust toward the relevant risk management institutions, providing support to the SARF. Specifically, in Hong Kong and Mainland China, people’s attention to Covid-19 information was found to positively influence their trust toward the relevant risk management institutions in mitigating the risk, which further influenced their risk perception and risk management behavior. In Taiwan, however, media attention was only found to influence institutional trust, which further influenced people’s risk perception; the effect, however, was not extended to their intention to get vaccinated, which could be attributed to the fact that vaccines were still not available in Taiwan at the time of the data collection (Taiwan Centers of Disease and Control, 2021).

Ability- and Benevolence-based Institutional Trust as Mechanisms of Risk Perception

Another significant finding from the study is that the two dimensions of institutional trust, namely ability-based and benevolence-based trust, exert different effects in different societal contexts. Specifically, the *ability* dimension of institutional trust was found to mediate the effect of media attention on risk perception and vaccination intention in Hong Kong, while in Mainland China, it was the *benevolence* dimension of institutional trust that mediated the effect of media attention on risk perception and risk management behaviors. In Taiwan, both dimensions of institutional trust significantly influenced people's risk perception, although the effect was not extended to vaccination intention, perhaps due to reasons discussed above.

These differential results across the three societies are consistent with the previous literature, which revealed inconsistent findings about the relative importance of ability-based institutional trust and benevolence-based institutional trust in influencing risk perception (Colquitt et al., 2007; Ho et al., 2020). Overall, the results suggest that the role of institutional trust on risk perception and risk management may be context-dependent rather than universal. In Hong Kong, people's risk assessment and risk management behaviors hinge more upon their belief about the relevant institutions' ability to handle the risk, while in Mainland China, individuals' beliefs about whether the institutions work in their interest plays a more central role in shaping people's perception of risk. In Taiwan, individuals' risk perceptions were influenced by both their assessment of risk management institutions' ability and benevolence.

Several contextual reasons might explain the differential results across the societies. Mainland China has an authoritative political regime that is characterized by centralized control of social affairs (J. Liu, 2014), which may have lent Mainland China an advantage in implementing social distancing and at-home quarantine policies (Ang, 2020). This may have led to a universally high perception of institutional *ability* among the Chinese residents, thereby decreasing variance in the perceived ability in the dataset and, therefore, the

influence of institutional *ability* on the Chinese public's risk perception. At the same time, the existence of conspiracy theories—although heavily censored by the government—speak of the public's mistrust toward the Chinese official institutions for concealing information from the public (Nie, 2020). This could have made benevolence-based, rather than ability-based, institutional trust a more central determinant for personal risk perception and risk management behavior: While the government may be universally perceived as competent, it was the perception that the government was working for the citizens' benefit that led to a greater vaccination intention. In contrast, the Hong Kong government has always been faulted by the public for following the footsteps of the central Beijing government too closely (Hartley & Jarvis, 2020). This might explain why the public's assessment of the institutions' ability in handling the pandemic played a more central role in influencing their assessment of personal risk and their intention to receive the vaccine. Out of the three societies, Taiwan is the only one that implements universal suffrage (Kwan, 2016). The embrace of democracy might have put the government and the relevant institutions more in the spotlight for public scrutiny, making both their capability to control the pandemic and their goodwill in working for the public significant determinants of the public's risk perception.

Post hoc Analysis Explicating the Trust Paradox and Differences across Societies

A more fascinating finding from the study is that, among the three societies, institutional trust was found to exert contrasting effects on risk perception and risk management behaviors. In Hong Kong, the results surfaced a *negative* relationship between institutional trust—albeit only the ability dimension of it—and people's intention to take the Covid-19 vaccine. In Taiwan and Mainland China, however, greater institutional trust led to *greater*, rather than less, perceived personal risk for getting the disease. In China, the positive effect of institutional trust was further extended to intention to receive the Covid-19 vaccine.

We conducted a *post hoc* analysis to better understand why the trust paradox was only observed in Hong Kong but not in the other two societies. Previous literature recognizes that one reason for the occurrence of the trust paradox is that greater trust in institutions could create a sense of security and thereby decrease the perceived necessity for taking preventive measures at an individual level (Colquitt et al., 2012; Han et al., 2017; Renn & Levine, 1991). This explanation implies that in order for the trust paradox to occur, individuals in a society must (1) consider institutions to be relatively important risk management agents in addition to citizens themselves and (2) be relatively satisfied with the institutions' performances so as to develop a sufficient level of security. We conducted two one-way ANOVAs to understand how the individuals in the three societies perceive the institutions' responsibility in handling the risk and their satisfaction with the relative institutions' performance¹. The results showed that Hong Kong participants had the highest level of perceived government responsibility ($M = 4.42$, $SD = .93$), compared with Taiwan ($M = 4.16$, $SD = 1.01$) and Mainland China ($M = 3.52$, $SD = 1.76$, $F(2, 9572) = 410.37$, $p < .001$). However, *inconsistent* with the explanation offered by the previous literature, Hong Kong participants were found to have the *lowest* level of satisfaction with institutions' risk management performance ($M = 3.85$, $SD = 1.41$), compared with Taiwan ($M = 4.83$, $SD = 1.14$) and Mainland China ($M = 5.58$, $SD = .88$) participants, $F(2, 9572) = 1834.06$, $p < .001$.

¹ We measured institutional responsibility by asking participants how much they thought the risk management institutions should bear the responsibility for the consequences of the epidemic on a 7-point scale ($1 =$ no responsibility; $7 =$ all the responsibility). For Hong Kong and Taiwan, the institutions included central government, local government, experts, and medical staffs; for Mainland, the perceived responsibility of central and local governments were not measured ($M = 4.02$, $SD = 1.38$, $\alpha_{\text{Hong Kong}} = .50$, $\alpha_{\text{Taiwan}} = .81$, $\alpha_{\text{Mainland China}} = .90$; Fu et al. 2021). We measured perceived satisfaction by asking participants how much they were satisfied with the handling of Covid-19 by the risk management institutions on a 7-point scale ($1 =$ strongly disagree, $7 =$ strongly agree): (1) Their measures are timely; (2) Their measures are proactive; (3) They do full research before taking measures; (4) They consider the interests of many parties before taking measures; (5) They consider the possible negative impact on people when dealing with Covid-19 ($M = 4.77$, $SD = 1.36$, $\alpha = .95$; Huang, 2008).

These results suggest that other reasons might account for the negative relationship between institutional trust and individuals' risk perception and risk management behaviors in Hong Kong. Being the most dissatisfied with a major risk management agent's performance, the Hong Kong public might have perceived a greater *personal* responsibility in handling the risk, which could explain the negative relationship between institutional trust and personal risk perception. In other words, the negative relationship between institutional trust and risk management behavior in Hong Kong is triggered by low, rather than high, satisfaction with the institutions' performance. This is different from how the previous literature interpreted the trust paradox observed in Singapore, which, as suggested by the authors, was triggered by high, rather than, low, satisfaction with the institution's performance and the sense of security it created (Wong & Jensen, 2020).

Yet another explanation for the differential results among the three societies, as suggested by the previous research (Ye & Lyu, 2020), is how the three governments approached the risk management of Covid-19. Among the three societies, Taiwan and mainland China took more of a defensive pessimistic approach to risk management regarding the Covid-19 pandemic, promoting the severity of the risk and urging the public to take risk management actions at individual levels (Yu & Li, 2020), while the media in Hong Kong focused more on the conflicts between the government's mandatory policies, local business, and the public's convenience in daily life (Yuen et al., 2021). This might explain why the public's perceptions of the risk level were positively related to their trust in the risk management institutions in Taiwan and mainland China, but a negative relationship between the two was observed in Hong Kong. It is, therefore, important for future research to take into consideration the specific messages advocated by the relevant risk management institutions when examining the relationship between institutional trust and risk management.

At a practical level, the nuances in how individuals assess personal risks cast implications on policymaking in the three societies. Notably, in an authoritarian society where there exists a constant struggle between individual freedom and government control (e.g., mainland China), the findings suggest that to raise individuals' personal assessment of risk and increase engagement with risk management behaviors, it is critical for the government and relevant institutions to demonstrate a sense of goodwill in their risk management policies, since it is the government's *benevolence* in risk management, rather than its *ability*, that played a major role in its citizens' risk perception. In societies where individuals are culturally more comfortable with the idea of assessing the government's performance, such as Taiwan and Hong Kong, the government needs to raise the public's perception of its *competence* in risk management, such as by adjusting the risk management policies in a timely fashion and clearly presenting the achievements of the risk management measures in communications with the public. The findings from Hong Kong further suggest that, in addition to demonstrating competence, it is also important for the government to promote a sense of personal responsibility in risk management, in order to avoid the trust paradox where a higher trust in relevant institutions' performances decreases assessed personal risk and risk management behaviors.

Overall, our results suggest that the relationship between institutional trust and risk perception in different societies may be explained by vastly different, context-specific reasons, rather than being uniformly triggered by the public's latency in risk management due to a high trust in the risk management institutions. The findings point to the need for further theorization on how the perceived responsibility of various risk management agents and the level of satisfaction with their performance *conjointly* influence risk perception and risk management at an individual level. The findings illustrate that societies with different political systems and government-citizen relationships may benefit from using different

approaches in risk management policy-making and in communicating the policies to the public.

Limitations and Future Direction

Several limitations of the present research should be addressed in future research. First, although the research surfaced societal differences in the role of institutional trust, the interpretation of the differences is based on post-hoc analysis. It is worthwhile for future research to simultaneously measure individuals' designation of risk management in responsibilities to institutions and to individuals to investigate their roles in causing the trust paradox. Second, the findings from the research are based on cross-sectional observational data, which does not rule out potential alternative models or extraneous variables that account for the effects. Future research should consider manipulating both dimensions of institutional trust to establish its causal relationship with risk perception and risk management behavior.

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