

The Impact of Trust in the Government on Willingness to Disclose Personal Data in Hong Kong: The Moderating Role of COVID-19 Infection Concern in the Data Disclosure Mediation Model

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Under COVID-19, there is an increasing demand for collecting health information from citizens by the government. It is commonly argued that there is a positive relationship between trust and willingness to disclose data. This finding has rarely been tested in the context of public health emergencies—for example, during COVID-19, when governments claim that data collection is necessary. Using a web survey result conducted in Hong Kong ($N = 906$), the moderated mediation model suggested that the indirect effect of trust in the Hong Kong government on citizens' willingness to disclose personal and health data through the perceived legitimacy of the government's actions is conditionally affected by COVID-19 infection concern. The direct effect involves normative thinking in considering the social norm of whether the government is legitimate to do so. Under strict law enforcement by the government, it creates an impression that personal concerns outweigh societal benefits, which can be explained by "data egoism," which would lower the indirect effect onto the willingness to disclose personal and health data. Theoretical and practical implications of the findings are discussed.

Keywords: trust, willingness to disclose personal data, privacy, COVID-19 infection concern, Hong Kong, survey

Data are important in many activities, and whether or not an individual is willing to disclose their personal information is a critical factor in determining its accessibility. Under COVID-19, there is an increasing demand for the government to collect health information from citizens because sharing

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personal and health information can be beneficial in combating the pandemic, for instance, collecting personal and health data for contact tracing purposes. The perception of data disclosure appropriateness is highly dependent on context. Given that disclosing personal information can pose a significant risk for the individual, trust is an important construct in understanding the dynamic relationships between the parties involved.

A vast amount of survey studies has been drawing positive correlations between trust and willingness to share data (e.g., Bijlsma, van der Crujisen, & Jonker, 2022; Grosso, Castaldo, Li, & Larivière, 2020). In other words, the more trust in the data collector, the higher the willingness to share personal data. During the COVID-19 pandemic, citizens may share their data with the government out of a sense of data altruism—that is, users consider their health data would benefit the health improvement of the general public (Karampela, Ouhbi, & Isomursu, 2019). Still, survey data show 80% of people in Hong Kong were worried about privacy issues in using contact tracing applications. This raises several fundamental questions, including whether the positive relationship between trust and willingness to disclose personal data applies in a health emergency context. Would a person weigh the advantages and disadvantages in considering disclosing their data or not? Does the positive relationship between trust and willingness to disclose personal data include consideration of whether the data collector's action is appropriate?

If one does not trust the data handler but only believes in the obligation to do so as a citizen, controlling self-behavior might result (Jackson & Gau, 2016). Positive expectations only encourage trusting behavior; it is unknown if these expectations involve normative thinking of data collection legitimacy. The perceived legitimacy of action is crucial to increase the cooperation of the citizens. However, little of the past literature has attempted to understand if trust aligns with the perception of normative behavior. It is interesting to understand the legitimacy of data collectors' actions plays a mediating role.

As noted by information privacy as a contextual integrity theory, the perception of information privacy is dependent on different contexts and situations (Nissenbaum, 2004). In other words, the cooperation of the citizens in providing their data depends on the context. Recently, the COVID-19 pandemic raised a vital urge for governments worldwide to gather COVID-19 information from citizens for purposes such as contact tracing, declaring that it is an emergency. The strong emphasis by the government on addressing their appropriateness in data collection might, in turn, persuade those who distrust the government to obey because of their obligations. This enhances the legitimacy of the government's legitimacy to collect data for the common good of the mass society.

In Hong Kong, because of the SARS pandemic that happened in 2003, people are particularly aware of the pandemic outbreak. But at the same time, the government has low trust because of the political crisis that happened during the 2019 Anti-Extradition Bill Movement (Lee, Yuen, Tang, & Cheng, 2019). Eighty percent of the respondents expressed concern about privacy issues. Hence, they considered not using the LeaveHomeSafe application (*The Standard*, 2021)—a contact tracing application designed by the government in Hong Kong. The distrustful attitude toward collecting personal data can be explained by the worrying attitude of being used as a tool for the government to surveillance (Calvo, Deterding, & Ryan, 2020; Trivedi, 2021). In this case, they considered the government did not have the right of power to collect their data. As a result, many citizens were opposed to the use of the application. The minority who supported

this application was those who supported the government, in other words, the proestablishment group (HK01, 2020). Do those supportive citizens solely depend on their trust in the government?

Implementing contact tracing applications and collecting personal data by the government in a low-trust area is difficult. Nonetheless, there has been a scarcity of studies on data disclosure in a low-trust environment, the specific social and political context of Hong Kong, making it a valuable context for reexamining the relationship between trust and willingness to disclose personal data. Would strong legal punishment by the government increase concern and override data altruism? It is desirable to understand the relationship in a declared emergency situation in a place where the general trust in the government is low and examine if the indirect effect can be moderated.

Using a web survey result conducted in Hong Kong ($N = 906$), this research study introduces two new variables, a mediator called perceived legitimacy of the government's actions and a moderator called COVID-19 infection concern. A moderated mediation model is presented, that the indirect effect of trust in the Hong Kong government on citizens' willingness to disclose personal data through the perceived legitimacy of the government's actions is conditionally affected by COVID-19 infection concern. This study shows that the stronger the COVID-19 infection concern, the lower the indirect effect on citizens' willingness to disclose personal data.

This study has several theoretical implications. First, this study offers insight into understanding the relationship between trust and willingness to disclose personal and health data under an important but underresearched context—public health emergencies. Second, the findings suggest that the theory of reasoned action and privacy as a contextual integrity theory can be applied to understand the factors that influence citizens' willingness to disclose personal and health data. Third, the findings of the study can have significant practical implications for governments in improving the legitimacy of their data collection practices and enhancing citizens' trust in how their personal data is handled.

The Relationship Between Trust and Willingness to Disclose Personal and Health Data

Information privacy is referred to as "the claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about them is communicated to others" (Westin, 1967, p. 7). The concerns toward information disclosure are subjective views of individuals (Campbell, 1997) and are affected by factors such as cultures and legal framework (Culnan & Bies, 2003). As Martin (2015, 2018) argued, privacy is viewed as a mutual agreement built on the relationship in exchanging information. In this case, among all the factors, trust, in particular, is vital in understanding the dynamics of the relationship, given that it is risky to do so (Grosso et al., 2020).

A considerable amount of research has been exploring the relationship between trust and willingness to share personal information (e.g., Bijlsma et al., 2022; Grosso et al., 2020). Trust—the willingness to accept susceptibility according to the positive expectation on one another based on confidence (Rousseau, Sitkin, Burt, & Camerer, 1998). Even though one has uncertainty about monitoring to control, trust raises positive expectations on another party, is crucial to decrease the risk perception, and encourages "a leap of faith" (Möllering, 2006).

Therefore, if an individual has a positive expectation of the data collector, there will be higher positive confidence in providing personal information. Indeed, multiple studies discovered a positive effect between trust and willingness to share data. In other words, the more trust in the institutions, the more willing they are to share data (e.g., Bijlsma et al., 2022; Grosso et al., 2020). However, the relationship depends on various factors. In terms of information types, Grosso et al. (2020) found that there is a positive correlation between trust in retailers and on willingness to provide personal information such as their demographic, financial, and medical data. In terms of service providers, Bijlsma et al. (2022) conducted a survey to understand customer willingness to share personal data with financial actors. Their results have shown that willingness to allow access to personal data is highest for consumers' own banks, compared with other banks, big techs, online stores, and supermarkets. Apart from trust, other factors also contribute to the higher level of willingness to share data, for example, primary beneficiary (Zhang et al., 2021), attitude toward the information (Juga, Juntunen, & Koivumäki, 2021), good level of data security, privacy, and confidentiality issues (Woldaregay et al., 2020).

As noted above, there is an increased demand for health-related data collection during the COVID-19 pandemic. Many studies have shown that citizens are willing to share their health information, which is commonly considered private, personal information. Seltzer and colleagues (2019) conducted a survey of 206 individuals and reported that they were eager to share their health data with researchers for medical study. A similar finding was also observed and influenced by factors, such as age, education, occupation, and level of digitization. It can be explained by data altruism that users considered their health data would benefit the health improvement of the general public (Karampela et al., 2019), and they considered the advantages to outweigh the risks (Anderson & Agarwal, 2011; Dinev & Hart, 2006; Papoutsis et al., 2015).

Government plays a vital role in data collection and handling. It has obligations to mediate the relationship between the data collector and the citizens (Swartz, 2003) and to determine the eligibility of the information exchanges (Prebble, 1990). Cullen and Reilly (2008) argued that the government should be seen from an organizational level, and such trust from citizens differs from the interpersonal trust. In New Zealand, data from focus groups show that respondents have a higher level of trust in sharing their information with the government than with commercial agencies (Cullen & Reilly, 2008). One of the reasons is that the government was perceived as less likely to sell personal information to third parties than commercial agencies (Cullen & Reilly, 2008). Trust in the information policies and the protection environment established by the government was found to be directly related to the willingness to share personal information (Nasser & Li, 2020). However, in terms of age group, the elderly were found to have a lower level of trust in the government in sharing personal and health information (Kim & Choi, 2019).

Many forms of personal information are collected by the government, including demographic information, for instance, name, and address, as well as health information, such as the health insurance number of the individuals. Does the positive relationship between trust in the government toward willingness to disclose personal data also apply in Hong Kong, a "hybrid-regime" (Fong, 2013) and a low governmental trust society? From the above, we can propose that under the context of the government collecting personal and health information from citizens, there is a positive relationship between trust in the government toward willingness to share personal and health information.

H1: Trust in the Hong Kong government is positively related to citizens' willingness to disclose personal and health data.

The Legitimacy of Government's Actions

This study introduces two new variables, a mediator called the legitimacy of government's actions and a moderator COVID-19 concern, to unpack the relationship between trust in government and willingness to disclose personal information. The legitimacy of the government's actions here is defined as whether the government can communicate the health data collection process to the public in a good way such that the general public understands the appropriateness of the action (Batista, da Silva, & Correa, 2017). The feeling of appropriateness is crucial since it can lead people to "feel that they ought to defer to decisions and rules, following them voluntarily out of obligation rather than out of fear of punishment or anticipation of reward" (Tyler, 2006, p. 375). It also relates to the perceptions of whether the process is biased or not (Maciejewski & Montgomery, 2016). Given that it is a public right, the government should consider the public interests in health information collection (Cui, 2019). One of the ways to enhance the perceived legitimacy is to improve the veracity—to disclose the data usage truthfully and accurately (Batista et al., 2017).

Although the concepts of trust and legitimacy are closely related and somewhat overlapping, the concept of trust differs from legitimacy, as noted by Jackson and Gau (2016). Although trust involves having positive expectations about data collection by the government, legitimacy refers to the appropriateness and rightfulness of the government's power to do so, considers whether the act is normatively acceptable, and whether citizens perceive the act as morally valid.

Trust and the duty to obey are both crucial elements of legitimacy. Jackson and Gau (2016) offered an example that when an individual decides whether a criminal justice institution is legitimate or not, "he or she must (a) believe that officials can be trusted to exercise their institutional power appropriately, and (b) feel a positive duty to obey rules and commands" (Jackson & Gau, 2016, p. 49). Trust in the institutions should be considered the basis of legitimate activities. Given that trust can help citizens cooperate with the government, adapt to the norms and actions proposed by the government, such that the government can monitor societies more efficiently. The relationship between trust and legitimacy can enhance the stability and growth potential in the long term (Moreno-Luzon, Chams-Anturi, & Escorcia-Caballero, 2018). Past works from the political science field have confirmed a positive relationship between trust and the legitimacy of actions. For example, survey findings suggested that trust in the European police is a crucial factor in altering the perceived legitimacy of police actions (Hough, Jackson, & Bradford, 2013). From the above, we can draw a hypothesis that:

H2: Trust in the Hong Kong government is positively related to the perceived legitimacy of the government's actions.

As Scott (2013) argued, legitimacy shows normative acceptance and conformity to the rules and laws, which means a high legitimacy perception shows citizens a higher willingness to conform and provide their personal data. From the above, it is logical to draw a hypothesis:

H3: The perceived legitimacy of the government's actions is positively related to citizens' willingness to disclose personal and health data.

As mentioned above, data disclosure is risky behavior, and it involves the confidence of the data collector, but would this thinking process involve the normative thinking of the appropriateness of the data collector? This implies the question of whether the trusting process involves a mediating process of thinking of the appropriateness of the action and if that action complies with the social norm. In this study, the direct effect of trust in the government on willingness to disclose personal and health behavior can be explained by the idea that people who trust the government are more likely to have a positive attitude toward disclosing their data and may perceive it as a normative behavior, resulting in a higher willingness to disclose.

Until now, no studies have examined the indirect effect of trusting processes through the appropriateness of the data collection process, so studying this variable is needed. To summarize the above, we first propose a mediation model that the trust in the Hong Kong government will indirectly influence the willingness to disclose personal and health data through the perceived legitimacy of the government's actions. The corresponding hypothesis is shown below.

H4: The perceived legitimacy of the government's actions mediates the relationship between trust in the Hong Kong government and citizens' willingness to disclose personal and health data.

COVID-19 Infection Concern

What has been explained above is the assumption that the relationship between trust and willingness to disclose personal data behavior involves normative thinking that action corresponds to the social norm. However, it cannot explain why many people in Hong Kong were hesitant to provide personal data to the government during the COVID-19 pandemic. According to the privacy as contextual integrity theory, information privacy disclosure is context dependent, defined as "compatibility with presiding norms of information appropriateness and distribution" (Nissenbaum, 2004, p. 155). In other words, individuals can have different opinions toward information privacy, depending on different contexts and situations.

This survey study was administered during the beginning of the COVID-19 pandemic, the time that data collection demand had increased. Citizen data, for example, locations, were collected (Lin, Carter, & Liu, 2021). Although these technologies might benefit from coping with the pandemic, would the COVID-19 infection concern—defined as the worriedness of an individual being infected with COVID-19—affect the data disclosure willingness? Past studies show that these technologies create the problem of health surveillance and turn into a feeling of being controlled and autonomy diminished (Calvo et al., 2020). Ultimately, it creates fear of actions to cope with the pandemic, such as COVID-19 tests (Trivedi, 2021).

The privacy concerns and adoption of COVID-19 measures are contingent on collective and individualistic cultures. People living in a collective society—South Korea had a lower level of privacy concern, and they considered higher public benefits for the measures than the American people, who have individualistic culture (Kim & Kwan, 2021).

Applying privacy as contextual integrity theory, it is worth noting that such appropriateness of the data collection process also depends on who can access the data and transmission principles (Vitak & Zimmer, 2020). Applying it in our study means citizens in Hong Kong consider disclosing their personal and health information since they regard them as appropriate to share with the government during the COVID-19 pandemic. If such information sharing is viewed as a significant benefit to society because of data altruism, would such appropriateness of the government's actions mediate citizens' trust in the government? At the same time, in Hong Kong statistics have shown that the citizens have low trust in the government.² If one has a high level of COVID-19 pandemic infection concern, will the personal infection concerns outweigh the societal benefits, overriding the appropriateness of the government's actions and, as a result, lowering one's willingness to share personal and health data?

Summing these altogether, we suggest that the COVID-19 infection concern plays a moderating role in the indirect effect of trust in the Hong Kong government on citizens' willingness to disclose personal data through the perceived legitimacy of the government's actions. Therefore, based on the above mediation model, a moderated mediation model is suggested with the variable COVID-19 infection concern moderating the relationship between trust in the Hong Kong government and the perceived legitimacy of the government's actions (Figure 1). The corresponding hypothesis is shown below:

H5: The indirect effect of trust in the Hong Kong government on citizens' willingness to disclose personal and health data through the perceived legitimacy of the government's actions is conditionally affected by COVID-19 infection concern. In other words, COVID-19 infection concern moderates the direct effect of trust in the Hong Kong government on the perceived legitimacy of the government's actions, which lowers the indirect effect onto the citizens' willingness to disclose personal and health data.

² According to the data retrieved from Hong Kong Public Opinion Research Institute (2022), there was 36.1% trust compared with 49.9% distrust toward the Hong Kong government at the time our survey was conducted.

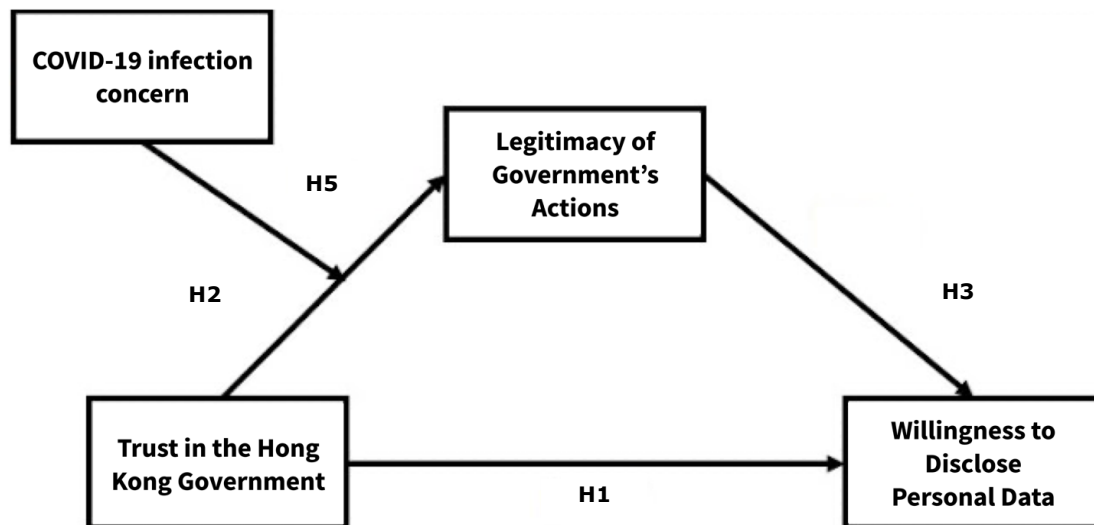


Figure 1. Proposed moderated mediation model. The indirect effect of trust in the Hong Kong government on citizens' willingness to disclose personal data through the legitimacy of the government's actions is conditionally affected by COVID-19 infection concern. Control variables are not shown in the figure here.

Method

To evaluate the research hypotheses, a survey is administered through a web survey panel company Rakuten Insight, during February 2021. The data were drawn from the *Data Security, Privacy and Innovation Capability in Asia: Case Studies Report* (Pang, Echle, Naumann, & Ho, 2022), it was a large-scale survey project conducted by Konrad-Adenauer-Stiftung, a political foundation in Germany in partnership with the National University of Singapore, aiming at comprehending the innovation and data policies in Asian places, such as South Korea, Singapore, Japan, and so on. In this research study, we selected the Hong Kong part to be the focus of analyzing among these Asian places. It is because Hong Kong was affected by the SARS pandemic in 2003 citizens in the city are particularly sensitive to pandemic control measures. As a result, citizens would be more likely to act collectively and cooperatively in response (Huang, Kwan, & Kim, 2021). However, in comparison to other collective places, Hong Kong is unique that citizens have low trust in the government following the 2019 Anti-Extradition Bill Movement (Lee et al., 2019), so despite the people's high pandemic awareness, many citizens are unwilling to share their personal and health data with the government (Lee, 2022). The distinct cultural, social, and political context that Hong Kong posits serves as important for understanding the relationships between trust in the government, willingness to provide personal and health data, and the mediating and moderating variables.

This study included the Hong Kong part of the large-scale project. The survey participants were chosen from a proprietary online panel and were matched to the Hong Kong general population as possible,

according to the census data. A total of 906 valid responses were collected. Table 1 illustrates the age composition of the study sample compared with the census data for Hong Kong as of the end of 2020.

Table 1. Age Composition of Study Sample and Hong Kong Population.

Age Group	Population (%)	Sample (%)
20–29	10.9	17.7
30–39	15.2	24.4
40–49	15.7	23.2
50–59	16.2	19.4
60–69	14.7	12.1
70–79	7.3	3.2

Measurement

Independent Variable: Trust in the Hong Kong government

To measure trust in the Hong Kong government, respondents were requested to indicate their trustfulness toward the Hong Kong government, under a 4-point scale, ranging from 1 = not at all to 4 = very much ($M = 2.0$, $SD = 0.93$).

Dependent Variable: Citizen's Willingness to Disclose Personal and Health Data

To measure citizen's willingness to disclose personal and health data, respondents were requested to indicate their willingness to share the following information (1) "Your demographic data (e.g., your name, your address)," and (2) "Your medical records (e.g., X-rays, CT scans)," using the following question, under a 4-point scale, ranging from 1 = very unwilling to 4 = very willing to disclose: "When you perform tasks online, some portals might want to collect data from you to provide better services. Please indicate your willingness to disclose the following information" (Roose & Pang, 2021, p. 37). These two items were averaged to form the index for citizens' willingness to disclose personal and health data ($M = 1.99$, $SD = 0.76$, Cronbach's $\alpha = .70$).

Mediating Variable: Perceived Legitimacy of Government's Actions

To measure the perceived legitimacy of the government's actions, respondents were asked to indicate their agreement with the following two statements, under a 4-point scale, ranging from 1 = strongly disagree to 4 = strongly agree: (1) "In the context of coronavirus/COVID-19, it is legitimate for governments to automatically retrieve personal data;" and (2) "In the context of coronavirus/COVID-19, governments should have full access to data from private companies, for example, GPS location, mall's surveillance, banking transactions, etc." (Roose & Pang, 2021, pp. 60–61). These two items were averaged to form the index for perceived legitimacy of the government's actions ($M = 2.17$, $SD = 0.88$, Cronbach's $\alpha = .81$).

Moderating Variable: COVID-19 Infection Concern

To measure the COVID-19 infection concern of the citizens, respondents were asked to indicate their levels of worriedness toward the following question, under a 5-point scale, ranging from 1 = not at all to 5 = extremely: "How worried are you that COVID-19 will infect you?" ($M = 3.4$, $SD = 1.13$).

Control Variables

Apart from the variables listed above, several demographic variables were controlled in the analysis, including age ($M = 43.64$, $SD = 13.78$), gender (male = 50.2%) and education ($M = 3.95$, $SD = 1.576$, 4 = associate's degree). Out of 906 responses, 57.17% of the respondents have possessed at least university level (include master's or doctoral degrees here).

Analysis

To explore the moderated mediated association, the PROCESS macro for SPSS (Hayes, 2013) was applied. First, PROCESS macro model 4 with 10,000 bootstrap samples and 95% confidence intervals (CIs) was used to understand the mediated effect of the perceived legitimacy of the government's actions on the relationship between trust in the Hong Kong government and citizens' willingness to disclose personal data. Second, PROCESS macro model 7 with 10,000 bootstrap samples and 95% CIs was used to understand the conditional indirect effect of trust in the Hong Kong government on citizens' willingness to disclose personal data through the legitimacy of government actions is conditionally affected by COVID-19 infection concern. The statistical significance is obtained when the lower-bound and upper-bound CIs do not include zero.

Results

This section reports the findings and results from the mediation and moderated mediation models. First, H1 states that trust in the Hong Kong government is positively related to citizens' willingness to disclose personal data, and results show that H1 was supported ($B = .1067$, standard error [SE] = $.0355$, $p < .01$). H2 states that trust in the Hong Kong government is positively related to the perceived legitimacy of the government's actions ($B = .6308$, $SE = .024$, $p < .01$); therefore, H2 was supported. H3 states that the perceived legitimacy of the government's actions is positively related to citizens' willingness to disclose personal data. Results also support H3 ($B = .1859$, $SE = .037$, $p < .01$).

Next, to test H4, results from the mediation analysis from PROCESS macro model 4 demonstrated that the perceived legitimacy of the government's actions mediates the relationship between trust in the Hong Kong government and citizens' willingness to disclose personal data. The unstandardized coefficient for the trust in the Hong Kong government on the perceived legitimacy of the government's actions on citizens' willingness to disclose personal data was $.2240$ ($SE = .0269$, 95% $CI = .1713$ to $.2767$) without the mediator, whereas it was reduced to $.1067$ ($SE = .0355$, 95% $CI = .0371$ to $.1764$). Therefore, the mediation model H4 was supported.

Finally, to test the moderated mediation model H5, which states that the indirect effect of trust in the Hong Kong government on citizens' willingness to disclose personal data through the perceived legitimacy of the government's actions is conditionally affected by COVID-19 infection concern. In other words, COVID-19 infection concern moderates the direct effect of trust in the Hong Kong government on the perceived legitimacy of the government's actions, which lowers the indirect effect onto the citizens' willingness to disclose personal data ($B = -.0079$, $SE = .0044$, 95% $CI = -.0174$ to $-.0002$). As a result, the moderated mediation model H5 was supported (Figure 1). Table 2 reports varying degrees of conditional indirect effects of trust in the Hong Kong government on citizens' willingness to disclose personal data depending on the level of COVID-19 infection concern. The moderated mediation effect is significant at low, middle, and high, given the bootstrap 95% confidence interval did not include zero. According to Table 2, the indirect effect was stronger at the low level than the middle level and had the comparatively lowest indirect effect when the COVID-19 infection concern level was at the highest. In other words, the stronger the COVID-19 infection concern, the lower the indirect effect on citizens' willingness to disclose personal data. Therefore, H5 was supported. The moderation effect of the model is plotted in Figure 2 highlights the direct effect of the trust in the Hong Kong government on perceived legitimacy of the government's actions as a function of COVID-19 infection concern.

Table 2. Conditional Indirect Effects of Trust in the Hong Kong Government on Citizen's Willingness to Disclose Personal Data Depending on the Level of COVID-19 Infection Concern.

Moderator		Model: Trust in the Hong Kong government on citizen's willingness to disclose personal data, mediated by perceived legitimacy of the government's actions		
COVID-19 infection concern	Effect	SE	Bootstrap 95% CI	
			LL	UL
Low	.1283	.0286	.0730	.1853
Middle	.1126	.0251	.0643	.1625
High	.1047	.0244	.0590	.1549

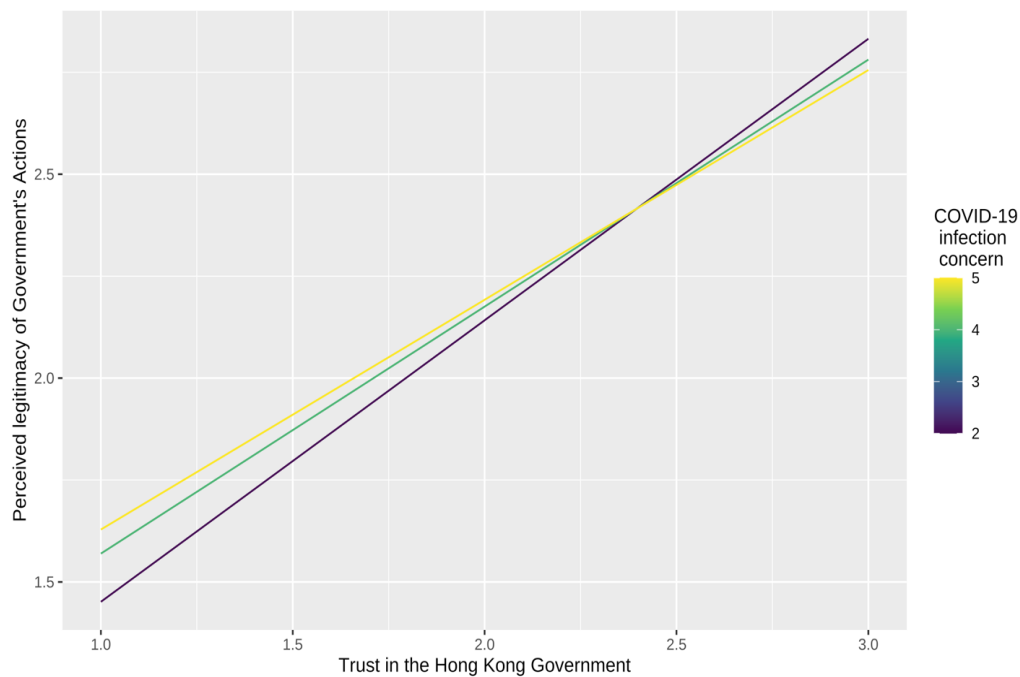


Figure 2. A visual representation of the direct effect of the trust in the Hong Kong government on perceived legitimacy of government's actions as a function of COVID-19 infection concern.

Discussion

This study unpacks the relationship between trust in the government and willingness to disclose personal and health data by including a mediator called the perceived legitimacy of the government's actions. Also, COVID-19 infection concern was included as a moderator. This study showed that the stronger the COVID-19 infection concern, the lower the indirect effect on citizens' willingness to disclose personal and health data.

Consistent with prior research (e.g., Bijlsma et al., 2022; Grosso et al., 2020), trust in the data collector was found to have a positive effect on willingness to disclose personal and health data. However, this study found a weaker positive relationship compared with previous findings. It might relate to the low trust of citizens in the government in Hong Kong (Hong Kong Public Opinion Research Institute, 2022). This study extends the findings to a non-Western context, a hybrid regime—Hong Kong. In Hong Kong, there are two polarized political ideologies, the prodemocratic camp and the proestablishment camp. The survey data were collected shortly after the large-scale protest, the Anti-Extradition Bill Movement 2019, which was a protest in response to the Hong Kong government about the extradition bill amendment. The heated controversies brought by the protest led to a low social atmosphere in Hong Kong. The political polarization has further extended to family settings, with political disagreements among family members having a negative impact on intrafamily communication (Kobayashi & Tse, 2022). At the time we did the survey, protest tactics were still taking place, like political consumerism (Lee et al., 2019). These implications of

political divide and sociopolitical tension may help to explain the low mean score of trust in the government reported in Hong Kong. It supports Lee's (2022) argument that despite a lack of major outbreaks throughout the year, public opinions of the administration remained overwhelmingly unfavorable.

In Hong Kong, the government adopted a comprehensive approach focused on border restrictions, social distancing and closure of schools, extensive contact tracing (including in-depth interviews of infected individuals), and location disclosure to identify exposure sites as part of controlling the spread of COVID-19 (Huang et al., 2021). However, because of the sociopolitical tension, the evaluation of pandemic control measures was seen as more "politicized" rather than solely focused on disease control. Prior research has shown that this "politicization" has a negative effect on expert communication. When a health expert agrees with the COVID-19 policies posed by the government, it can lower their perceived trustworthiness (Yuen, 2023). In such circumstances, citizens in Hong Kong may not have had enough confidence to provide personal information to the government, especially when they were aware that the data may be sent to a third party, such as Mainland China. This led to the situation where the Hongkongese preferred writing down their venue visits on paper rather than using the contact tracing application such as LeaveHomeSafe, which used GPS tracking and Bluetooth on mobile phones (Huang et al., 2021). This research supports Huang et al. (2021) argument that contact tracing in Hong Kong, based on sensitive location data, has a relatively low acceptance rate compared with South Korea and the United States. This study provides empirical evidence to further contribute to the idea that gaining public trust and ensuring a sense of appropriateness are vital for the effective implementation of any location-based application under emergency situations.

This study introduced the perceived legitimacy of the government's actions as the mediator of the model. It helps us understand the perceived appropriateness of the government to collect personal and health information data from the citizens is affected by the level of trust, which in turn affects the level of willingness to disclose personal and health data under the context of COVID-19. It also reflects whether the government is perceived as having considerable enough public interests to collect the data and thus bring significant social benefits. This study has documented a positive relationship between trust and the perceived legitimacy of the government's actions, consistent with the previous findings (Hough et al., 2013). It confirms that trust in the government is the prerequisite to providing the basis of the government's perceived legitimacy in collecting data. It can be explained by the theory of reasoned action (Fishbein, 1980), that people's behavior is determined by their attitudes toward the behavior and their subjective norms. It can be used to predict and comprehend various behaviors, including consumer, environmental, and health-related behaviors. In this case, trust in the government may directly influence individuals' willingness to disclose data, as individuals may believe that doing so will lead to positive outcomes for themselves or for society as a whole. However, the theory also suggests that the perceived legitimacy of the government's action or normality of appropriateness of disclosing data may also play a role in this behavior. In the context of COVID-19, individuals are more likely to disclose data if they find that it is the socially responsible thing to do.

In addition, this study also examines the moderator—COVID-19 infection concern. The COVID-19 pandemic has been declared a health emergency, and governments rely strongly on technologies to enhance timely communication and control (Leclercq-Vandelannoitte & Aroles, 2020). It addresses the legitimacy

behind the actions because of data altruism—the consideration of the whole common good for the society outweighs the negative consequences.

However, results from the moderated mediation model show that the indirect effect is counterintuitive, that the high COVID-19 infection concern hinders the indirect effect of trust in the government on citizens' willingness to disclose personal data. It further leads to the concept that opposites to data altruism, called data egoism—suggests that individuals are primarily motivated by their own interests when it comes to data sharing. However, even if individuals are motivated by their own interests, they still need to accept COVID-19 policies because they may believe that COVID-19 directly affects their own health. To further explain this, we need to delve deeper into sociopolitical factors. In this case, the society in Hong Kong has developed a norm of fearing strict law enforcement, where being identified as a COVID-19 carrier could have severe consequences. This fear may reduce the willingness to disclose personal data, especially when individuals do not perceive any benefits from sharing their data or are concerned about the potential risks or negative outcomes of data sharing. The decision of whether to engage in data sharing or not, weighing the costs and benefits, can also be explained by the social exchange theory (Cropanzano & Mitchell, 2005). In the context of tight law enforcement during the COVID-19 pandemic in Hong Kong, one might weigh whether the perceived personal consequences of disclosing data (e.g., fear of being identified as infected) outweigh the societal benefits (e.g., contribution to data for public health purposes).

Given that, one's perceptions of the legitimacy of the actions are drawn on people's perception of their obligations and commitment as a citizen rather than the fear of penalty or reward endorsement (Tyler, 2006). A possible reason is a concern about the consequences of being infected, particularly in tight law enforcement of the COVID-19 measures in low-trust societies such as Hong Kong. If citizens are found to be positive toward COVID-19 after disclosing their health data, those in close contact might be affected. The fear of punishment might address the reason for the moderator—the tight law enforcement, in particular under the low-trust atmosphere, gives citizens a feeling of health surveillance, and thus, they hesitate to disclose their data. Since the fear of punishment is not raised from the voluntary thought of commitment as a citizen, instead, they are forced to do so. Leclercq-Vandelannoitte and Aroles (2020) argued that the concept of "control societies" is becoming normalized during the pandemic crisis; this study demonstrates that the problem of health surveillance leads to the feeling of being controlled and a question of the legitimacy of the government's actions, which in turn, fear to provide the data would not fully achieve the aim of contact tracing and fight with the pandemic.

This study also imposes practical implications. This study has shown that the more legitimate perceived the data collection process, the more willing people are to disclose their personal data. Given that disclosing personal information is risky, despite a high level of trust, a justification of the data collector on the reason why it is appropriate to collect the data are needed. This variable is crucial to help citizens cooperate with the government to retrieve automatically and fully access personal data. On the contrary, once the government does not explain their appropriateness in the data collection process in a good way, it might affect citizens' willingness to disclose their data, particularly affecting the contact tracing process. Although constantly updating the legislation to address the privacy concern is needed to enhance the trusting beliefs toward the government (Lin et al., 2021), it is suggested that improving transparency of the data collection rationale behind might address the legitimacy of the data collection. Batista et al. (2017) and Maciejewski and Montgomery (2016)

have mentioned several strategies, for instance, communicating to the public better and persuading the public the process is not biased to enhance its legitimacy. de Fine Licht, Naurin, Esaiasson, and Gilljam (2014) suggested that transparent decision making, by justifying the rationale of the decision behind the closed door, promotes legitimacy. In the European Union, a significant step forward has been taken with the establishment of the Data Governance Act about data altruism. This act encourages individuals and companies to voluntarily share data in specific sectors such as health, environment, agriculture, and more, with the aim of improving research and services. By providing guidelines that data collectors must adhere to and emphasizing the importance of obtaining consent from individuals, the act hopes to enhance data trust. The more facts are disclosed, the more truth can be known, such that the "black box" can be as open as possible (Ananny & Crawford, 2018). Although transparency does not always imply more trust in the data controller, given that different people can have different perceived confidence in the system and the data being disclosed (Schnackenberg & Tomlinson, 2016), the more transparent the process can be disclosed, the public can understand more if the process is biased or not. Therefore, transparent writing of the data usage by the government can enhance their perceived legitimacy. It is worth noting that the level of transparency needs not to be fully transparent, a careful justification inside the black box is recommended instead (de Fine Licht et al., 2014). Clearly indicating the use of data collection and addressing the significant concerns of the public raised, for example, if the collected data will be shared with third parties, including Mainland China, in the Personal Information Collection Statement, is one of the ways to improve the perceived legitimacy, eventually willingness to disclose personal data can be enhanced.

This study cannot be concluded without mentioning the limitations. First, the moderated mediation introduced COVID-19 infection concern as a moderating variable to address the emergency of the data collection situation. However, this variable is only applicable to the COVID-19 period, which means the moderated mediation might not be able to generalize to other contexts. Still, this research provokes thought on extending the relationship between trust and data disclosure behavior during an emergency context. Future research should continue to understand the data disclosure behavior in other emergency situations. Second, caution is needed when interpreting the findings. Given that some variables in the two models are observed variables rather than latent variables, this study used PROCESS macro rather than Structural Equation Modeling. PROCESS macro is based on OLS regression, and the indirect and direct effects are most likely biased (Hayes, Montoya, & Rockwood, 2017). Still, some of the variables in the mediation model that lack a latent variable measurement are indeed a limitation of this study.³

In conclusion, this study introduces the perceived legitimacy of the government's actions as a mediating factor altering the relationship between trust in the Hong Kong government and willingness to disclose personal and health data. This study also examines the moderating role of COVID-19 infection concern, and results from the moderated mediation model show that the stronger the COVID-19 infection concern by the citizen, the lower the indirect effect on citizens' willingness to disclose personal data. The study implies that the direct effect of trust in the government enhances their willingness to disclose their

³ It is worth noting that in the case of moderated mediation, the accurate estimation of interactions between latent variables remains extremely contentious, and there are numerous approaches available that have different assumptions. Although different methods can yield different findings and are prone to assumptions, it is difficult to evaluate whether the obtained interaction estimates are reasonable (Haynes et al., 2017).

personal and health data, involves normative thinking in considering the social norm of whether the government is appropriate to do so, which can be explained by the theory of reasoned action. On the other hand, this study extends privacy as a contextual integrity theory, that the indirect effect can be moderated under an emergency situation. However, under strict law enforcement by the government, it creates an impression that personal consequences outweighs the mass society benefits—explained by data egoism, which would lower the indirect effect onto the willingness to disclose personal and health data.

This study has profound implications, as it goes beyond previous research that solely focused on the positive relationship between trust in data collectors and willingness to disclose data. It emphasizes the importance of considering the perception of the appropriateness of data collection, especially during health emergencies where data collection is argued to be “necessary.” This research highlights the need to also take sociopolitical conditions into consideration when it comes to data disclosure. Even individuals with high levels of trust in the government may question the necessity of data collection because of fears of the personal consequences of being categorized as infected, which leads to a reduced indirect effect onto the willingness to disclose personal and health data. The results of this study provide valuable insights for policy makers who are designing health policies with the goal of increasing compliance with data collection efforts. Enhancing transparency and demonstrating legitimacy are key factors that should be considered in future policy design.

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