

7-31-2021

Voluntary Behavior Modification during a Pandemic: Perceptions and Behaviors toward COVID-19 in Japan

Firman Budianto

Research Center for Area Studies, the Indonesian Institute of Sciences, Jakarta 12710, Indonesia,
firman.budianto@lipi.go.id

Yuichi Nishikori

Graduate School of Asia-Pacific Studies, Waseda University, Tokyo 169-0051, Japan

Follow this and additional works at: <https://scholarhub.ui.ac.id/hubsasia>

Recommended Citation

Budianto, F., & Nishikori, Y. (2021). Voluntary Behavior Modification during a Pandemic: Perceptions and Behaviors toward COVID-19 in Japan. *Makara Human Behavior Studies in Asia*, 25(1), 12-22.
<https://doi.org/10.7454/hubs.asia.4140920>

This Original Article is brought to you for free and open access by UI Scholars Hub. It has been accepted for inclusion in Makara Human Behavior Studies in Asia by an authorized editor of UI Scholars Hub.

Voluntary Behavior Modification during a Pandemic: Perceptions and Behaviors toward COVID-19 in Japan

Modifikasi Perilaku Sukarela di Masa Pandemi: Persepsi dan Perilaku terhadap Pengendalian COVID-19 di Jepang

Firman Budianto^{1*} and Yuichi Nishikori²

1. Research Center for Area Studies, the Indonesian Institute of Sciences, Jakarta 12710, Indonesia

2. Graduate School of Asia-Pacific Studies, Waseda University, Tokyo 169-0051, Japan

ABSTRACT

This study examines social measures meant to stop the spread of COVID-19 in Japan, where COVID-19 control relies heavily on the voluntary compliance of citizens. We examine how the government's campaign for controlling COVID-19 is perceived by people, and how these measures influenced people's attitudes and behavior. This paper specifically discusses how people's perceptions regarding COVID-19 control measures temper orthodox understandings of behavior modification, such as perceived threats, and how it influences their attitude and behavior. Qualitative data collected from an online open-ended questionnaire was cross-sectionally analyzed. This study argues that high risk perception is actually just one of many triggers of behavior modification. That is, people responsive to risk perception had to match actual hazards to perceived real risk. Furthermore, popular sources of information on COVID-19, like news and social media, were found to substantially influence people's behavior. In particular, whether campaigns were easy to understand, whether there were societal expectations for people to follow behavior modifications, and whether people thought measures were effective at preventing COVID-19 infection had a strong impact on the adoption of behavior modification. These findings thus fill in lacuna in existing scholarship concerning the rationality behind people's decision to voluntarily adopt behavior modification measures.

ABSTRAK

Penelitian ini bertujuan untuk mengeksplorasi bagaimana kampanye pemerintah terhadap pengendalian COVID-19 dipersepsikan oleh masyarakat dan pada akhirnya mempengaruhi sikap dan perilaku mereka. Dengan memilih Jepang, negara yang pengendalian COVID-19-nya sangat bergantung pada kemauan masyarakat, sebagai studi kasus, penelitian ini mendiskusikan bagaimana persepsi masyarakat di Jepang mengenai pengendalian COVID-19 mempengaruhi pemahaman atas modifikasi perilaku yang telah ada, seperti persepsi akan ancaman; serta bagaimana persepsi masyarakat di Jepang terhadap pengendalian COVID-19 mempengaruhi sikap dan perilaku mereka. Data kualitatif yang dikumpulkan dari kuesioner terbuka daring dianalisis dan diinterpretasikan secara silang. Penelitian ini menemukan bahwa persepsi yang kuat akan risiko infeksi bukanlah merupakan satu-satunya pemicu dalam perubahan perilaku masyarakat. Lebih lanjut, respon masyarakat terhadap persepsi akan risiko infeksi muncul ketika ia dihadapkan dengan risiko nyata. Selain itu, dimensi informasi perantara ditemukan menjadi penentu dimana perilaku orang dipengaruhi oleh beberapa faktor, seperti antara lain, apakah kampanye upaya pemerintah tersebut mudah dipahami, adakah tuntutan sosial dalam masyarakat untuk mematuhi upaya pengendalian tersebut, dan penilaian seberapa efektifkah upaya tersebut. Penilaian atas efektivitas modifikasi perilaku tersebut diinternalisasi secara positif oleh sebagian besar responden. Lebih lanjut, penelitian ini menunjukkan pentingnya peran Pemerintah Jepang sebagai pembentuk norma sosial yang berkelanjutan. Temuan penelitian ini dengan demikian berkontribusi dalam studi terdahulu tentang perubahan perilaku masyarakat yang tidak secara khusus melibatkan identifikasi alasan sebab-akibat.

Original Article

*Correspondence Author:

Firman Budianto
E-mail: firman.budianto@lipi.go.id

Received: 31 May 2020

Revised: 07 September 2020

Accepted: 14 September 2020

Keyword: behavior modification, COVID-19 in Japan, risk perception, social distancing, social response to COVID

Cite this article: Budianto, F. & Nishikori, Y. (2020). Voluntary behavior modification in the times of during a pandemic: Perceptions and behaviors toward COVID-19 in Japan. *Makara Human Behavior Studies in Asia*, 25(1), 12-22.
<https://doi.org/10.7454/hubs.asia.4140920>

1. Introduction

Beginning in March 2020 and throughout April, Japan and many other industrialized nations experienced an upsurge in the number of confirmed cases of COVID-19, followed by a significant reduction in new cases beginning in the second week of May. On May 25, nearly four months after the first case of COVID-19 was confirmed on January 16, Japan rescinded the nationwide declaration of a state of emergency and gradually resumed its economic activities under “new normal” measures (World Health Organization [WHO], 2020).

The Japanese central government introduced the three following major initiatives to control the spread of COVID-19: (1) detecting and responding to clusters early; (2) enhancing intensive care treatment and securing the emergency medical service system and medical equipment for severely ill patients (Ventilators, ECMO, etc.); and (3) encouraging behavior modification among citizens (Ministry of Health, Labour, and Welfare [MHLW], 2020a). In particular, the Japanese government announced behavior modification initiatives as early as March 1 (MHLW, 2020b), requesting that citizens “avoid the 3 Cs”—confined spaces, crowded places, and close contact (Prime Minister of Japan and His Cabinet, 2020b).

On April 7, 2020, the central government declared a state of emergency in accordance with article 32 of the Act on Special Measures for Pandemic Influenza and New Infectious Diseases Preparedness and Response (Act No. 31 of 2012; Prime Minister of Japan and His Cabinet, 2020a). Countries such as France enacted specific confinement orders to stop community spread that were enforceable through punitive measures (Pineau & Frost, 2020). However, legal scholars have noted that in Japan, despite the declaration of a state of emergency, the state did not invoke its power to order citizens to comply with community spread prevention orders. That is, the government requested that citizens voluntarily comply with COVID-19 restrictions, but these requests were not legally mandated (Repeta, 2020). This is significant, as stopping community spread is reliant on the voluntary participation of the population to modify their behavior as requested by the government, such as complying with the 3 Cs campaign.

The adoption of such measures, however, was not always successful. In late March, crowds flocked to famous cherry blossom sightseeing locations in Tokyo (The Japan Times, 2020). Even after a single-day peak of 204 cases on April 17, people continued to frequent places such as large supermarkets in the suburbs of Tokyo (NHK, 2020). There was a case where an infected man in Aichi Prefecture defied health official’s instructions to stay home and intentionally tried to spread the virus to

others (Kyodo News, 2020). These examples demonstrate the importance of understandings people’s perceptions of and behaviors toward social measures and what motivates people in Japan to either voluntarily comply with behavioral modification measures or defy such measures.

Several research papers in behavioral studies have examined individual and collective behaviors in response to the COVID-19 pandemic. This research focuses on the effect of perceived threats of contracting COVID-19, social norms, and government regulations on people’s behavior and attitudes. In general, there are two theories that can be applied to the analysis of the relationship between social norms and people’s beliefs and behaviors during a pandemic: the theory of planned behavior (TPB) and protection motivation theory (PMT). The TPB emphasizes that individuals’ behaviors are affected by the behavioral norms of their social community (Ajzen, 2011). Moreover, Cialdini (2001) suggests that during times of uncertainty, individuals tend to look to social norms to accurately understand and effectively respond to social situations. In the context of the COVID-19 pandemic, Chan et al. (2020) argue that social situations and personal beliefs influence individuals’ decision to voluntarily comply with COVID-19 prevention measures. Whereas TPB theorizes the external factors that contribute to shaping behavior, PMT emphasizes that preventive behavior by individuals is affected by how they perceived self-efficacy (e.g., Hung et al., 2014). Besides self-efficacy, fear assessment can also affect individuals’ behavior (Pakpour & Griffiths, 2020). Moreover, Bavel et al. (2020) suggest that intense fear produces a change in behavior only when the individual predicts a change in behavior to be effective. These studies suggest that people’s behaviors and attitudes are influenced by multiple factors, including perceived threats, social norms, and government regulations.

This study aims to explore individual narratives in order to assess how social measures and public health campaigns related to COVID-19 are perceived by individuals, and how these perceptions influence public attitudes and behaviors. Previous studies have examined the effectiveness of behavioral modification strategies such as social distancing measures (Prem et al., 2020), the influence of national policies and political beliefs on social distancing measures (Painter & Qiu, 2020), and the relationship between expectation and duration in the context of social distancing measures (Briscese et al., 2020). However, these studies do not consider the relationship between such behavioral modification strategies and the rationalities expressed in individual narratives. Furthermore, whereas research on COVID-19 control measures in countries such as Vietnam (Huynh, 2020), Indonesia (Djalante et al., 2020), China (Li et al., 2020), and the United States (Adolph et al., 2020)

focuses mainly on governmental policies and community responses, this case study of Japan investigates people's perceptions of and behavior toward COVID-19 control measures on the individual level.

Our study presents the following two explorative research questions: (1) Have people in Japan adopted behavioral modification measures for COVID-19 disease control? If so, how and why have people done so? (2) How have governmental public health campaigns for COVID-19 disease control in Japan been perceived by people, and how have these perceptions influenced public attitudes and behaviors?

This study aims to contribute to scholarship on the influence of social norms and beliefs on people's attitudes and behaviors toward social measures meant to curtail the spread in COVID-19 in the context of Japan, where no compulsory measures have been implemented. This study further sheds lights on the effectiveness of COVID-19 related policies by examining public awareness and identifying mechanisms that drive voluntary compliance with behavior modification measures.

2. Methods

This study employs a qualitative approach to collect and analyze data gathered through an online questionnaire offered in both Japanese and English. The cross-sectional questionnaire used an open-ended format in order to accommodate the views and opinions of each respondent on the given topic. This approach resembles ground theory approaches. In addition to several respondent awareness questions, the questionnaire included nine questions for gathering demographic data, 36 open-ended questions, and 4 ordinal questions. Respondents in this study were required to be (1) a current resident of Japan who has been living in the country since at least May 2020 and (2) at least 20 years old. As outlined under the Personal Information Protection Law of Japan, respondents were not asked for information that would make them personally identifiable in order to ensure that our research was ethical and that the privacy of our respondents was protected. Information such as respondents' names, addresses, affiliations and contact information was not collected, and therefore, the dataset is completely anonymous. A consent statement and compulsory verification questions confirming respondents' voluntary participation in the survey as well as explicit statements regarding a respondent's ability to remove oneself from the survey at any time were placed in the beginning of the questionnaire so that respondents had to fill out these sections before proceeding to the questionnaire.

Data was collected during the second, third, and fourth weeks of May 2020. The questionnaire was distributed nationwide via social network platforms. During the period that the survey was conducted, the state of emergency was gradually lifted. Responses were received from residents of the following eight prefectures in Japan: Kochi, Ehime, Hiroshima, Okayama, Shiga, Kyoto, Aichi, and Tokyo Metropolitan. Responses were also collected from residents of the following five large metropolitan areas that are official "designated cities" in Japan: Kobe, Kyoto, Niigata, Saitama, and the 23 Special Wards of Tokyo. Respondents were from cities of various sizes and had a variety of educational backgrounds. The ratio of Japanese to foreign respondents was one to four, and the biological sex of respondents was nearly even. The age of respondents ranged from 20 to over 70 years old. Unfortunately, only two respondents were medical professionals or those worked in the health care field.

The qualitative data was categorized and coded according to several themes. We collect 59 responses, yet only 53 responses satisfied the above two criteria and were included in this study. We followed Weiss's (1995) qualitative analysis method when categorizing narratives and identifying correlations among topics. Respondents' answers to open-ended questions were carefully analyzed and interpreted. We categorized the discussion topics presented in the following sections according to the theme code and categorization of the narratives.

3. Results and Discussion

"Avoid the 3 Cs": Japan's social distancing model

The phrase "Avoid the 3Cs" (in Japanese. "*mitsu no mitsu wo sakemashō*") was introduced by the Japanese government in early March (MHLW, 2020b) to publicize the main behavioral modification measures for preventing the spread of COVID-19. Instead of using the term "social distancing," which is widely used in other countries, the government regularly adopted the term "the 3 Cs" (Prime Minister of Japan and His Cabinet, 2020a, 2020b) to identify locations (closed spaces and crowded places) as well as behaviors (close contact) that risk exacerbating the spread of infection. The majority respondents of this study were well aware of the meaning of the 3 Cs and perceived them to be an effective measure for preventing the spread of infectious diseases. Some people referred to the three Cs with the alternative phrase "avoid the 3 denses," which refers to the original Japanese term *mitsu* meaning "dense." This simple phrase is easy to remember and understand. Some respondents interpreted the 3 Cs as a request instead of an order, with one respondent mentioning, "It's a suggestion from the government to avoid closed spaces, crowded places, and close contact in order to

prevent the spread of coronavirus” (female, masters level, student, 26-30 years old, Ehime Prefecture).

Respondents reported practicing the 3 Cs in various ways. While some respondents complied with the 3 Cs by avoiding closed spaces, crowded places, close contact (e.g., male, Ph.D. holder, job unspecified, 26-30 years old, Hiroshima Prefecture), others took additional measures, such as staying home, wearing a mask, reducing non-essential trips out of the house, and avoiding public transportation. Our respondents who declared they are practicing the 3 Cs made a specific effort to practice the 3 Cs, but did partake in some unavoidable actions, such as going to grocery stores or using public transportation. Some respondents reported following the 3 Cs by working and studying from home, while others commented that they had no choice but to commute to work. This demonstrates that an individual’s willingness to practice the 3 Cs is—to a certain degree—determined by practical limitations, such as structural factors beyond ones’ control. Furthermore, when we asked respondents how they feel about practicing the 3 Cs, some noted that although they experienced difficulty at first, they gradually became accustomed to these new behaviors. Narratives such as “It’s super difficult. It takes a lot of fun from my life.” (male, Ph.D. holder, contract employee, 31-35 years old, Tokyo Metropolitan) and “It’s tiring.” (female, masters level, student, 26-30 years old in Kyoto Prefecture) were common among respondents when discussing the 3 Cs. Indeed, this demonstrates that practice the 3 Cs involves a gradual process of adaptation in addition to sacrifice.

When we compared respondents’ understanding of the 3 Cs to their understanding of social distancing, we discovered a clear difference in responses. Respondents regarded the 3 Cs as describing particular situations and settings that they must avoid in order to *not get infected*. Social distancing, in contrast, was perceived as a measure for minimizing physical contact between people. In particular, an interesting finding of this study is that many respondents considered practicing the 3 Cs to be an instance of social distancing. That is, in the Japanese context, practicing the 3 Cs can be regarded as a form of social distancing. Therefore, this study suggests that the 3 Cs can be seen as Japan’s extended model of social distancing for two main reasons. First, the 3 Cs, as Japan’s main behavior modification measure for COVID-19 disease control, was positively perceived by the majority of respondents. Second, the 3 Cs are a social distancing measure that is unique to Japan and replaces more common social distancing campaigns adopted outside of Japan.

A state of emergency: A late but significant move

The Japanese government first declared a state of emergency in relation to the COVID-19 pandemic on April 7, 2020, for seven prefectures. The declaration was subsequently expanded to include the entire country on April 16. The declaration was made following a surge in the number of confirmed cases in late March, and was declared nearly three months after the first confirmed COVID-19 case in Japan. Therefore, it is not surprising that many respondents stated that the declaration should have been made sooner.

Following the declaration, local governments were given increased legal authority to institute necessary measures to prevent the spread of infection. Even so, authorities were still not granted the authority to arrest violators (Johnston, 2020). Indeed, the state of emergency was not equivalent to a “lockdown.” Prime Minister Shinzo Abe confirmed this when he stated, “It is not possible to implement compulsory restrictions on leaving the house that carry penalties” (Prime Minister of Japan and His Cabinet, 2020c). Despite the absence of sanctions and penalties, this study found that the declaration of a state of emergency had varied effects on respondents’ daily lives. We identified two key narratives regarding the implications of the state of emergency. The first narrative (group 1) described the declaration as having no effect on the daily lives respondents and their perceptions of COVID-19. The second narrative (group 2) described the declaration as having effects on both respondents’ daily lives and their perceptions of COVID-19. Furthermore, as observed by Wise, Zbozinek, Michelini, Hagan, and Mobbs (2020), the risk perception model identifies that the perceived risk of oneself getting infected as being one of the most important determinant of behavior modification. Thus, it is crucial to determine if the state of emergency changed the perceptions of respondents toward COVID-19, and if so, how perceptions changed.

In the first group, one respondent commented that his daily life had changed, but not because of the declaration: “Yes and not. Because I have been working from home since late February. Also, most of my favorite events, concerts, and trips have been canceled since about the same time, too. In general, it’s not the state of emergency that caused the change, but the pandemic itself that caused the change to my daily life” (male, Ph.D. level, contract employee, 31-35 years old, Tokyo Metropolitan). This respondent claimed that the pandemic had already begun affecting his daily life weeks before the declaration. This is partly because the company he works for implemented remote working very early on in the pandemic. Similar to other respondents, he further claimed that the declaration did not affect how he views COVID-19. A number of respondents expressed that they have considered COVID-19 to be serious from

the beginning. For example, one respondent stated, “No change at all. I have always considered COVID-19 to be an emergency” (female, masters level, full time housewife, 26-30 years old in Kyoto Prefecture). This study found that people whose daily lives were affected by COVID-19 at an early stage—either at work, school, or during their free time—perceived COVID-19 to be a serious issue long before the declaration of the state of emergency. Their perceptions of COVID-19 were therefore heavily influenced by how severely their lives were affected. The declaration, however, did not have an immediate impact on their views or actions related COVID-19.

The second group, in contrast, described the declaration of a state of emergency as having influenced their perceptions of COVID-19. When we asked respondents whether their perceptions of COVID-19 changed after the declaration, respondents in this group made statements such as, “Yes, I must take this matter seriously.” (male, bachelor level, full time employee, 26-30 years old, Tokyo Metropolitan), “Yes, because of the declaration of emergency, my awareness has increased.” (female, masters level, civil servant, 36-40 years old, Ehime Prefecture), and “Yes, this pandemic is serious and we have to be aware of it.” (female, Ph.D. level, unemployed, 36-40 years old, Ehime Prefecture). Such narratives demonstrate that, in contrast to the former group, the declaration has effected perceptions of COVID-19 and induced people in this group become aware of the risk presented by COVID-19. The influence of the declaration on perceptions also had implications for behavior. For example, the deceleration made people more aware of the need to maintain good hygiene, live a healthier lifestyle, wear masks, and practice the 3 Cs. Given such varied implications, this study suggests that the declaration of a state of emergency was a significant COVID-19 disease control measure despite the fact that many viewed this measure as being implemented too late. Reflecting on the findings of Wise et al. (2020) that suggest that the perception of risk was one of the triggers for people responding to and adopting behavior modification measures, even though many respondents adopted preventative measures, it is difficult to contribute these changes to the declaration. Indeed, although the declaration resulted in a heightened sense of awareness concerning the pandemic situation in Japan, only a small number of respondents (2 to 3) explicitly mentioned that the declaration caused them to perceive COVID-19 as a threat. This casts doubt on the notion that perceived threat results in behavioral modification.

The new lifestyle: The call for clear information

The “new lifestyle” (*atarashii seikatsuyōshiki*) is the latest approach to COVID-19 disease control in Japan and can be regarded as the country's COVID-19 exit

strategy. This term, used in combination with “new normal” (*aratana nichijō*), was formally introduced by Prime Minister Abe at a May 14 press conference at which the lifting of the declaration of a state of emergency was announced. At the press conference, no clear explanation of these new slogans was given. Instead, the government repeatedly emphasized the importance of refraining from visiting places covered by the 3 Cs. Due to this lack of official explanation, about half of respondents were unaware of these slogans.

Therefore, the “new lifestyle” was perceived in a variety of ways by respondents in both groups. This study identified three main narrative groups regarding perceptions of the “new lifestyle” in Japan: (1) those who put an emphasis on the *new* lifestyle itself, (2) those who see it as a form of adaptation to COVID-19, and (3) those who simply perceive it as a continuation of the 3 Cs.

The following narratives illustrate the first group's emphasis on emerging *new* lifestyles resulting from COVID-19: “[...] remote work, online classes, etc.” (male, Ph.D. level, contract employee, 31-35 years old, Tokyo Metropolitan) and “Wear a mask, keep clean, always washing hands” (female, bachelor level, student, 26-30 years old, Tokyo Prefecture). In contrast, the second group of narratives demonstrates a perspective that views the “new lifestyle” as a form of adaptation to COVID-19: “I don't know whether it is the same as the new normal which has been announced everywhere in the world now. It means that we have to get used to this condition, we have to live our life normally even though the virus is still around us.” (female, masters level, student, 26-30 years old, Ehime Prefecture) and “A new lifestyle to live with the COVID-19 around us, to keep healthy and prevent COVID-19 spread” (male, Ph.D. level, student, 26-30 years old, Kyoto Prefecture). In contrast, the third group of narratives represents the point of view that the “new lifestyle” is a continuation of the 3 Cs: “Continue normal life and practicing the 3 Cs.” (female, bachelor level, contract employee, 26-30 years old, Aichi Prefecture), “Continue practicing the 3 Cs.” (female, Tokyo Metropolitan), and “Continuing ‘avoid the three Cs’ campaign” (male, Ph.D. level, student, 26-30 years old, Kyoto Prefecture). These varied perspectives on the new lifestyle demonstrate the need for clearer information regarding Japan's COVID-19 exit strategy, as a lack of clear information can lead to uncertainty in the post-COVID world.

Information literacy: Expert information requires a platform.

In Japan, there was a rise in chain emails spreading inaccurate or false information about COVID-19 in February when the first few COVID-19 cases were reported in Japan and again in April. One such chain email was said to have originated from a medical

health professional deployed to Wuhan, People's Republic of China, and claimed that the COVID-19 coronavirus was susceptible to high heat (Jiji Press, 2020). Other chain email messages gave readers a false sense of security by downplaying the infectiousness of COVID-19, with some of the chain emails claiming one could "cure" coronavirus by drinking hot water. Additional chain emails in late March and April warned of an imminent "lockdown" similar to those imposed abroad, despite this being politically impossible in Japan (Diamond Online, 2020). Therefore, it is crucial to identify which respondents were receiving such false information on COVID-19 and from what sources. Second, it is important to determine if they looked for additional information from reputable sources. As Sun et al. (2013) observed, socio-demographic characteristics are key underlying variables that determine prior knowledge and health literacy. As demonstrated in Wolf et al. (2020), our findings found that those with higher health literacy were more likely to change their behaviors in response to perception of contracting COVID-19. Therefore, it is crucial to determine whether information literacy has an impact on the adoption of behavior modification.

Our study identified five major sources of information from which respondents passively obtained information on COVID-19: (1) online news media, (2) non-Japanese news media, (3) from friends and relatives, (4) workplaces and schools, and (5) social networking sites. Respondents were not receptive to information provided by primary information producers, such as, verified SNS accounts pertaining to COVID-19, or central and local government sources. However, respondents were also not receptive to information from chain emails. Information sources related to COVID-19 actively searched for by respondents mostly coincided with the sources utilized for passive dissemination of COVID-19 related information, such as, news and social media. One respondent (male, masters level, student, 20-25 years old, Tokyo Metropolitan) who possessed an elementary understanding of Japanese stated that he relied on "learning from advertisements in my home country" to learn about social distancing. The respondent confused the physical distancing, which is at the heart of the Japanese social distancing campaign, with more general social distancing campaigns found in countries outside of Japan, that is, that more closely resembles the Japanese government's objectives under the 3 Cs campaign.

Besides two respondents (female, bachelor level, full time housewife, 61-65 years old, 23 Special Wards of Tokyo; non-Japanese male, Ph.D. level, student, 26-30 years old, Kyoto City), respondents did not receive inaccurate or false information about COVID-19 via

chain email. Respondents who actively sought out primary sources of expert information, such as the WHO website and COVID-19 statistics dashboards, had a more accurate understanding of the coronavirus and the behavior modification objectives of Japanese government campaigns. One respondent (male, Ph.D. level, others, 31-35 years old, Kobe City) relied on verified SNS accounts for information and demonstrated a strong understanding of government campaigns, such as the two meter physical distancing recommendation, which is part of Japan's social distancing campaign. Many respondents who referred to multiple primary sources of information held at least a master's degree, suggesting a high accessibility threshold for primary source information.

This has two important implications. Producers of primary expert information must ensure information is being distributed via sources that are frequently utilized by the general public, as information literacy remains quite low for the majority of the population. Likewise, organizations such as schools, news media corporations, and governments must continue actively disseminating information, as these are some of the most common sources from which people utilize to find information about COVID-19.

The risk of infection: perception of risk matters

As Wise et al. (2020) suggest, the perception that one is personally at risk of being infected with COVID-19 motivates people to adopt behavior modification measures. To examine this further, we asked respondents to first identify whether they had witnessed any positive COVID-19 cases around them and whether they felt that they were likely to contract COVID-19, and if so, why. Xiao et al. (2014) found that in addition to risks such as perceived threat (called threat pathways), coping pathways—such as whether those at risk find that their actions can be preventative—are also important determinants of behavior modification.

Surprisingly, respondents did not display a perception of risk concerning contracting COVID-19. Indeed, no respondents declared thinking it was "highly likely" (scale 5 out of 5), and only two respondents selected the second highest response of "4." This could be because no respondents had witnessed a positive COVID-19 case among their immediate family or relatives, with only four respondents having declared that one of their friends or colleagues had contracted COVID-19. Nonetheless, with the exceptions of "new lifestyle," awareness of behavior modification measures was quite high and, more importantly, adoption of behavioral modification was also very high at over 90% for the 3 Cs and social distancing campaigns amongst respondents who were aware of it.

One of the respondents (male, bachelor level, full time employee, 26-30 years old, Tokyo 23 Special Wards) reported his risk of contracting COVID-19 as “4,” as his job entailed being in close physical proximity with customers. In answering why he followed social distancing guidelines, he stated, “I don't want to be infected and I have family to support. But it's difficult for me to practice social distancing, as my job involves close contact with customers.” This response highlights how people face dilemmas when attempting to reduce their risk of infection. This was also reflected in a response from another respondent (female, Ph.D. level, part time employee, 36-40 years old, Kyoto Prefecture) who declared her risk category as “3,” as she must use the train to commute to work. Both respondents practiced the behavior modification measures that were possible in their situations, such as not being in close-proximity to other people and avoiding crowded places, in order to reduce their risk of contracting COVID-19.

A nuanced picture arises when one looks at respondents who declared that they perceived it to be “highly unlikely” (2) that they would contract COVID-19. A respondent (male, masters level, student, 20-25 years old, Tokyo 23 Special Wards) who, despite knowing had a friend or colleague who tested positive for COVID-19, declared that he was very unlikely to contract COVID-19. His stated reason was: “I have been self-isolating for several weeks.” Another respondent (female, masters level, student, 26-30 years old, Ehime Prefecture) who declared that she was “very unlikely” to contract COVID-19, stated, “Currently, I have limited contact with everyone and am practicing physical distancing.” Yet, this respondent reported still following the 3 Cs campaign “because it helps prevent the spread of the virus and the possibility of getting infected.” A different respondent (female, bachelor level, housewife, 61-65 years old, Tokyo 23 Special Wards) who also declared that she was “very unlikely” to contract COVID-19 because she was taking efforts to increase her own immunity, still practiced social distancing as she did not want to contract COVID-19.

This study presents three significant findings regarding perception of the risk of infection. First, perception of risk of contracting COVID-19 was not necessarily driven by objective assessments, such as positive COVID-19 cases around a respondent. Instead, risk perception was heavily influenced by whether respondents themselves were partaking in specific activities that would increase their exposure to COVID-19. Secondly, respondents who modified their behavior were confident that they had a lower risk of contracting COVID-19, thus indicating that they truly believed behavior modification to be effective against contracting COVID-19. Thirdly,

regardless of the perception of risk of contracting COVID-19, most respondents adopted at least one of the behavior modifications requested by Japanese government campaigns. Whereas Xiao et al. (2014) found that an interaction of threat pathways of “expected” severity from catching the disease, intrinsic rewards of the risky action, and coping pathways of self-efficacy of preventative measures were all found to be significant determinants of behavior modification, this study found that coping pathways such as self-efficacy to be the most important, with the other two not being as salient or not present in respondent data. This could be a result of the timing of the survey, as the consequences of COVID-19 were still unfolding.

Disease control: invoking both individual and social responsibility is crucial. More analysis is needed to determine why some respondents adopted behavior modification even when they were not worried about contracting COVID-19. Some studies have identified reasons other than risk perception to explain why people modify their behavior. One such explanation highlights individual personality characteristics such as extroversion and conscientiousness (Carvalho et al., 2020). However, this does not explain the motivations of people who perceive a low level of risk yet engage in behavior modification. Cooperation from this group is crucial to the success of behavior modification campaigns, as they can sometimes occupy the largest portion of the population, as was the case in this study.

To better understand this group, we identified four major groups of people: (1) those who perceive a high risk of getting infected and are adopting behavior modification measures, (2) those who perceive a high risk but are not adopting behavior modification measures, (3) those who perceive a low risk but are adopting behavior modification measures, and finally (4) those who perceive a low risk and are not adopting behavior modification measures. Looking closer at group (3), we identified two further sub-groups: those who adopt behavior modification measures out of individual responsibility and those who adopt behavior modification measures out of social responsibility.

A respondent (male, in Tokyo 23 Special Wards) from the first sub-group identified *wanting to not get infected* as a reason for adopting the 3 Cs. A respondent from the second sub-group (female, masters level, housewife, 26-30 years old, Kyoto city) stated, “It's something I can do to contribute to flattening the curve and stopping the spread of the infection.” Another respondent (male, masters level, self-employed, 51-55 years old, Okayama Prefecture) from the second sub-group stated that he adopted behavior modification measures because he interpreted social distancing guidelines as instructions

that all citizens should follow out of a sense of social responsibility. However, this distinction does not mean that respondents from the first sub-group did not consider their social responsibility. Indeed, in response to the question of what do you think about someone who does not practice the 3 Cs, one respondent (female, high school level, self-employed, over 70 years old, Tokyo 23 Special Wards) stated that such an action was self-centered, indicating that respondents in the first sub-group also considered social responsibility when adopting behavioral changes. This agrees with Bavel et al.'s (2020) assertion that it is necessary to promote examples of acceptable social behavior. In the Japanese case, because respondents displayed a high presumption of efficacy, it was unclear from the survey results whether respondents willingly internalized new norms without considerable external pressure because of the effectiveness of key actors in disseminating information, or if there is a different reason for this internalization. For example, it could be that the gap between pre-existing norms and new norms introduced during the Covid-19 pandemic was minimal, and therefore, the thresholds for adopting mass behavioral change was lower in Japan.

Across the spectrum of risk perception levels, both individual and social responsibility were found in similar frequency as reasons for adopting behavior modification. Although there were cases of respondents who perceived a *low level of risk and did not adopt behavior modification* (group 4), reasons for not observing behavior modification were not due to a lack of individual or social responsibility but rather unavoidable circumstances. This is demonstrated in the response of one respondent (male, Ph.D. level, student, 31-35 years old, Shiga Prefecture) who stated, "Sometimes I need to meet more than two people." This suggests that willingness to practice the 3 Cs is not independent from structural limitations, as discussed in the previous section.

4. Conclusion

This study discussed how the Japanese government's behavior modification measures were perceived by people and how they actually influenced behavior. This study found that respondents willingly adopted behavioral modification measures for COVID-19 disease control regardless of their level of perception of infection risk. Respondents' decisions to adopt social measures were further influenced by respondents' perception of information concerning such measures. This study finds that what seemed to matter more was whether campaigns were easy to understand, whether there were societal expectations for people to follow behavior modification measures,

and whether people thought said measures were effective at preventing COVID-19 infection.

The 3 Cs campaign, which this study regards as Japan's model of social distancing, was positively perceived as an effective measure for preventing the spread of coronavirus. The simplicity of the 3 Cs helped raise people's awareness and understanding of the measure itself. This demonstrates that it is extremely crucial for information producers, including governments, to ensure that information is clear, minimizes misinterpretation, and is disseminated through popular channels and platforms.

This study found the declaration of a state of emergency to have played a significant role in impelling people to adopt behavior modification measures and recognize their importance. The declaration, which had both psychological and behavioral implications, shaped people's behavior by raising people's awareness of COVID-19 and changing people's perception of the risk of infection. This perception change, coupled with a sense of individual and social responsibility, contributed to shaping behavior changes. Moreover, as this study has suggested, individual and social responsibility are correlated, meaning that the adoption of behavior modification measures in Japan occurred at the intersection of both senses of responsibility.

For respondents who perceived a low level of risk, it was found that government campaigns were crucial for instilling a sense of individual and social responsibility and motivating individuals to adopt behavior modification measures. As discussed earlier, explicit announcements such as the declaration of a state of emergency helped create an atmosphere that normalized a new mode of behaviors.

With the exception of a small minority of respondents with advanced degrees, information literacy was found to be low for many respondents regardless of demographic characteristics. Information created by primary information producers and expert information on COVID-19 often suffered from low searchability. Thus, primary information producers must increase outreach effectiveness via information dissemination intermediaries that are commonly used by the general public, such as news organizations and educational institutions.

High risk perception was found to be one of multiple triggers for behavior modification, not the only trigger (i.e. sometimes independent). Moreover, we found that as a cause of behavior modification, high risk perception was multi-staged. People who perceived a high degree of risk had to match actual hazards to perceived real risk. Those who adopted behavior

modification without perceiving a high level of risk did so as a precautionary measure, contingent on the belief that behavior modification was effective for preventing infection. The former, given its responsiveness to actual hazards, is more akin to crisis management, and the latter, given its proactive stance, is more akin to risk management. This dynamic resulted in a broad adoption of behavior modification by nearly all respondents. Given these findings, this study contributes to discussions on voluntary behavioral change in the context of behavioral modification measures. However, due the limited data collected and used, this study suggests that further studies be conducted using other data collection methods, such as in-depth interviews and longitudinal observation.

Regarding perceptions of Japan's multiple social distancing campaigns, the majority respondents adopted the measures requested by the government regardless of whether respondents viewed the implementation of these campaigns favorably or unfavorably. Likewise, the effects of threat perception and social norm mechanisms on the adoption of social distancing measures were tempered. Respondents rationalized their behavior modifications by stating that it is what one must do to stay safe or that it is what one ought to do, with almost no mention of feeling compelled by a third party (not including information received or sought out by respondents themselves). Thus, when attempting to induce behavioral modification, exposure to information via campaigns and the direct internalization of said information by respondents themselves seemed to be the most decisive factor. Given these findings, this paper recommends that other researchers operationalize and quantify the impact of informational exposure on behavioral modification and look into other intermediary causes, such as the level of trust in information from government sources.

Acknowledgement

The authors would like to express their sincere gratitude to all our respondents across Japan for participating in this study. We declare that there was no external funding associated with this research, including sources such as the authors' affiliations or other third-party organizations.

References

- Adolph, C., Amano, K., Bang-Jensen, B., Fullman, N., & Wilkerson, J. (2021). Pandemic politics: Timing state-level social distancing responses to COVID-19. *J Health Polit Policy Law*, 46(2), 211-233. <https://doi.org/10.1215/03616878-8802162>
- Ajzen, I. (2011). *Attitudes, personality and behavior*. McGraw-Hill/Open University Press. <https://doi.org/10.1101/2020.03.30.20046326>
- Bavel, J. J. Van, Baicker, K., Boggio, P. S., Capraro, V., Cichocka, A., Cikara, M., ... Willer, R. (2020). Using social and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour*, 4, 460-471. <https://doi.org/10.1038/s41562-020-0884-z>
- Briscese, G., Lacetera, N., Macis, M., & Tonin, M. (2020). *Compliance with COVID-19 Social-Distancing Measures in Italy: The Role of Expectations and Duration* (No. IZA Discussion Papers 13092). <http://hdl.handle.net/10419/216404>.
- Carvalho, L. de F., Pianowski, G., & Gonçalves, A. P. (2020). Personality differences and COVID-19: are extroversion and conscientiousness personality traits associated with engagement with containment measures? *Trends in Psychiatry and Psychotherapy*, 42. <https://doi.org/10.1590/2237-6089-2020-0029>
- Chan, D. K. C., Zhang, C.-Q., & Weman-Josefsson, K. (2020). Why people failed to adhere to COVID-19 preventive behaviors? Perspectives from an integrated behavior change model. *Infection Control & Hospital Epidemiology*, 1-2. <https://doi.org/10.1017/ice.2020.245>
- Cialdini, R. B. (2001). *Influence: Science and Practice* (4th ed.). Allyn & Bacon.
- Diamond Online. (2020, April 10). Korona wazawai de yahari detekuru nise jōhō, dema, chēmēru, akushitsu sagi... (False information, hoaxes, chain mails, malicious scams that also appear in Corona). *Diamond Online*. <https://diamond.jp/articles/-/234195>
- Djalante, R., Lassa, J., Setiamarga, D., Sudjatma, A., Indrawan, M., Haryanto, B., ... Warsilah, H. (2020). Review and analysis of current responses to COVID-19 in Indonesia: Period of January to March 2020. *Progress in Disaster Science*, 6, 100091. <https://doi.org/10.1016/j.pdisas.2020.100091>
- Hung, W.-S., Hu, S. C., Hsu, Y.-C., Chen, K.-L., Chen, K.-H., Yu, M.-C., & Chen, K.-T. (2014). Factors affecting the use of anti-malaria preventive measures among Taiwan immigrants returning to malaria-endemic regions. *Travel Medicine and Infectious Disease*, 12, 370-377. <https://doi.org/10.1016/j.tmaid.2013.07.001>
- Huynh, T. L. D. (2020). The COVID-19 containment in Vietnam: What are we doing? *Journal of Global Health*, 10. <https://doi.org/10.7189/jogh.10.010338>

- Jiji Press. (2020, May 24). Korona-ka ni demawaru chēnmēru ni ki o tsukete (Be careful of chain mails that appear in Corona). *Jiji Press*. <https://www.jiji.com/jc/article?k=2020052100680&g=soc>
- Johnston, E. (2020, April 8). What changes under Japan's state of emergency declaration? *The Japan Times*. <https://www.japantimes.co.jp/news/2020/04/08/national/politics-diplomacy/japan-changes-under-state-of-emergency/#.XtDfjW5uJsc%0D>
- Kyodo News. (2020). Infected man in Japan who wanted to "spread virus" dies. *Kyodo News*. Retrieved from <https://www.japantimes.co.jp/news/2020/03/18/national/infected-man-japan-wanted-spread-virus-dies/>
- Li, S., Wang, Y., Xue, J., Zhao, N., & Zhu, T. (2020). The impact of COVID-19 epidemic declaration on psychological consequences: A study on active Weibo users. *International Journal of Environmental Research and Public Health*, *17*, 2032. <https://doi.org/10.3390/ijerph17062032>
- Ministry of Health, Labour, and Welfare (MHLW). (2020a). About Coronavirus Disease 2019 (COVID-19). https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/newpage_00032.html%0D
- Ministry of Health, Labour, and Welfare (MHLW). (2020b). Shingata koronairusu no shūdan kansen o fusegu tame ni (To prevent the outbreak of Novel Coronavirus). <https://www.mhlw.go.jp/content/10900000/000601720.pdf>
- NHK. (2020). Tonai jūtakugai no sūpā ya kōen hitode herazu biggudēta bunseki (Big data analysis shows no reduction of crowd in supermarket and local park in Tokyo Metropolitan residential area). *NHK*. <https://www3.nhk.or.jp/news/html/20200504/k10012417481000.html>
- Painter, M., & Qiu, T. (2020). Political Beliefs affect Compliance with COVID-19 Social Distancing Orders. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3569098>
- Pakpour, A. H., & Griffiths, M. D. (2020). The fear of COVID-19 and its role in preventive behaviors. *Journal of Concurrent Disorders*, *2*, 5863.
- Pineau, E., & Frost, L. (2020). France toughens lockdown penalties as coronavirus kills medic. *Reuters*. <https://www.reuters.com/article/us-health-coronavirus-france-doctors/france-toughens-lockdown-penalties-as-coronavirus-kills-medic-idUSKBN2190L0>
- Prem, K., Liu, Y., Russell, T. W., Kucharski, A. J., Eggo, R. M., Davies, N., ... Hellewell, J. (2020). The effect of control strategies to reduce social mixing on outcomes of the COVID-19 epidemic in Wuhan, China: a modelling study. *The Lancet Public Health*, *5*, e261–e270. [https://doi.org/10.1016/S2468-2667\(20\)30073-6](https://doi.org/10.1016/S2468-2667(20)30073-6)
- Prime Minister of Japan and His Cabinet. (2020a). Press Conference by the Prime Minister Regarding the Declaration of a State of Emergency (April 7, 2020). http://japan.kantei.go.jp/98_abe/statement/202004/_00001.html
- Prime Minister of Japan and His Cabinet. (2020b). Press Conference by the Prime Minister regarding the Novel Coronavirus (March 28, 2020). http://japan.kantei.go.jp/98_abe/statement/202003/_00002.html
- Prime Minister of Japan and His Cabinet. (2020c). Press Conference by the Prime Minister regarding the Novel Coronavirus (May 25, 2020). http://japan.kantei.go.jp/98_abe/statement/202005/_00003.html
- Repeta, L. (2020). The coronavirus and Japan's Constitution. *The Japan Times*. <https://www.japantimes.co.jp/opinion/2020/04/14/commentary/japan-commentary/coronavirus-japans-constitution/#.XsQH9G5uLop>
- Sun, X., Shi, Y., Zeng, Q., Wang, Y., Du, W., Wei, N., ... Chang, C. (2013). Determinants of health literacy and health behavior regarding infectious respiratory diseases: a pathway model. *BMC Public Health*, *13*, 261. <https://doi.org/10.1186/1471-2458-13-261>
- The Japan Times. (2020, March 21). Why is Japan still a coronavirus outlier? *The Japan Times*. <https://www.japantimes.co.jp/opinion/2020/03/21/commentary/japan-commentary/japan-still-coronavirus-outlier/#.Xsa1p25uKCh>
- World Health Organization [WHO]. (2020). Novel Coronavirus - Japan (ex-China). <https://www.who.int/csr/don/16-january-2020-novel-coronavirus-japan-ex-china/en/>
- Wise, T., Zbozinek, T., Michelini, G., Hagan, C., & Mobbs, D. (2020). Changes in risk perception and protective behavior during the first week of the COVID-19 pandemic in the United States. <https://doi.org/10.31234/osf.io/dz428>

Wolf, M. S., Serper, M., Opsasnick, L., O'Connor, R. M., Curtis, L. M., Benavente, J. Y., ... Bailey, S. C. (2020). Awareness, attitudes, and actions related to COVID-19 among adults with chronic conditions at the onset of the U.S. Outbreak. *Annals of Internal Medicine*, M20-1239. <https://doi.org/10.7326/M20-1239>

Xiao, H., Li, S., Chen, X., Yu, B., Gao, M., Yan, H., & Okafor, C. N. (2014). Protection motivation theory in predicting intention to engage in protective behaviors against schistosomiasis among middle school students in rural China. *PLoS Neglected Tropical Diseases*, 8, e3246. <https://doi.org/10.1371/journal.pntd.0003246>