

論文の要旨  
Summary of the Dissertation

論文題目  
Dissertation Title

Behavioral research for pandemic policymaking: Focusing on activity-travel behavior and social contact decisions under the impacts of COVID-19  
(パンデミック政策のための行動 : COVID-19 の影響下における活動・交通と社会的接触の意思決定に着目して)

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The Coronavirus disease (COVID-19) is an infectious disease with a strong transmission through not only liquid particles but also smaller aerosols. Anyone can be infected with COVID-19 and become seriously ill or die at any age. Although the aggressivity and fatality of the new variant of COVID-19 is much weaker now, the number of daily new confirmed case is still high in recent waves globally. The risk of the COVID-19 pandemic is still a threat to human beings' health and safety. Meanwhile, the strictest lockdowns policy measures are no longer practical and sustainable in most countries for the issues of economies and people's well-beings. It is desirable to conduct a sensible and acceptable pandemic policymaking to seek for the balance between people's normal life and pandemic prevention. While conducting a sensible pandemic policymaking is based on the knowledge of individuals' behavioral mechanisms. To obtain that knowledge, we need to explore the individuals' behavioral mechanisms during the pandemic. Because the COVID-19 virus mainly transmitted by the social contacts among people.

Hence, this dissertation aims to provide a comprehensive behavior analysis for pandemic policymaking via exploring individuals' behavioral mechanism of activity-travel behavior and social contact, and to provide the scientific evidence for further pandemic policymaking, hoping improving the efficiency of pandemic policymaking by decreasing the risk of infection and prompting people to follow the policy.

The research content is organized as follows:

Chapter 1 introduces the background, motivation, research questions, objectives, research framework, contributions, and outline of this dissertation.

Chapter 2 presents the literature reviews of the focused research contents in this dissertation: behavioral and psychological adaptations to COVID-19, travel mode choice behavior and social contact behaviors during the COVID-19 pandemic.

Chapter 3 introduces the survey data and modeling approach that used in the methodologies of this study.

Chapter 4 provides a behavior analysis of activity-travel behavior changes during the pandemic in Japan. The life-oriented panel data of behavioral and psychological adaptations to

COVID-19 collected from April to September 2020 in Japan is used. And a dynamic structural equation model (DSEM) is developed to quantify the dynamic associations between individuals' reliability of information sources, risk perceptions, attitudes toward COVID-19 policymaking capability, attitudes toward PASS-LASTING based policies and the behavior changes over time.

Chapter 5 provides a behavior analysis of individuals' travel mode choice behaviors during the COVID-19 pandemic via the travel data in a comparative survey of activity-travel and social contact before-during COVID-19 conducted in six developed countries (Australia, United States, New Zealand, Canada, United Kingdom, Japan) in 2021. The latent impacts of risk perception at different spatial scales, trust toward governments/medical agencies' capacity to control the pandemic and the cultural orientations related to risk on individuals' travel mode choices across different travel purposes are quantified by a mixed hybrid choice model (XHCM). The unobserved heterogeneities related to pre-pandemic preparedness induced by experiencing influenza (measured by risk-concerned travel habits formed during influenza seasons before the pandemic) and during-pandemic travel attributes are reflected in the mixed logit form as well.

Chapter 6 shows the descriptive analysis of the changes of the number of social contacts before and during the COVID-19 pandemic. The social contact data for different contact settings (in activity locations and public transport vehicle) in the comparative survey of activity-travel and social contact before-during COVID-19 is used to explore the changes of social contacts in the mentioned six developed countries. The changes of the number of social contacts are obtained by calculating the total number of social contacts for all participants and the mean number of social contacts for people who have maintained their daily social contacts before and during the pandemic. The heterogeneities of social contacts across personal attributes and key activity participation attributes are revealed.

Chapter 7 provides a quantitative behavior analysis of people's joint social contact behaviors in six developed countries during the pandemic. This chapter used the same social contact data for daily activities in chapter 6. A joint copula-based model is developed to estimate people's social contact behaviors represented by the unordered choice of contact modes and ordered choice of the number of contacted persons simultaneously. The impacts of people's demographic attributes, activity participation attributes and risk-related psychological factors on social contact behaviors are quantified in the joint copula-based model. Not only people's average performance of social contact for daily activities but also the different sensitivity levels of social contact choice to influencing factors across different contact settings are estimated.

Chapter 8 provides the conclusions in this dissertation.

備考 論文の要旨はA 4判用紙を使用し、4,000字以内とする。ただし、英文の場合は1,500語以内とする。

Remark: The summary of the dissertation should be written on A4-size pages and should not exceed 4,000 Japanese characters. When written in English, it should not exceed 1,500 words.