

## 論文審査の要旨

博士の専攻分野の名称	博 士 ( 工 学 )	氏名	HONGXIANG DING
学位授与の要件	学位規則第 4 条第① 2 項該当		
論 文 題 目			
<p>Behavioral research for pandemic policymaking: Focusing on activity-travel behavior and social contact decisions under the impacts of COVID-19</p> <p>(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)</p>			
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〔論文審査の要旨〕			
<p>This research focuses on the impacts of COVID-19 and people's behavioral responses to the impacts. It aims at providing behaviorally sound evidence for supporting the policymaking of COVID-19 and future pandemics. Such evidence has remained unknown. To fill such a research gap, this study implemented two types of nationwide online questionnaire surveys in six developed countries, including Japan, and conducted several modeling analyses. The surveys are all based on the life-oriented approach, where the first targets monthly activity-travel behaviors between April and September 2020, only in Japan (respondents: 2643) and the second, implemented in March-May 2021, investigates both activity-travel and social contact behaviors in six developed countries before and during COVID-19 pandemic (respondents: more than 1000 in each country and 7245 in total). A dynamic structural equation model, a mixed hybrid choice model, and a copula-based integrated model were built and estimated. Factors incorporated into the modeling analyses include, (1) individual and household attributes, (2) attributes of activity, travel, and social contact behaviors, (3) triggers of behavior changes, and (4) various psychological factors. Psychological factors further include reliability of risk information, risk perceptions at different spatial scales, expertise and competence of and trust in stakeholders (government, medical agencies, etc.), cultural risk factors (hierarchists, individualists, egalitarians, fatalists), pre-pandemic preparedness, coping ability (self-efficiency, safety awareness, etc.), attitudes toward necessity and punishment (in case of violation of pandemic rules) of activity participation, attitudes</p>			

toward various COVID-19 policies (PASS: “Prepare-protect-provide”, “Avoid-adjust”, “Shift-share”, and “Substitute-stop”), LASTING: “Life needs”, “Activity participation”, “Space”, and “Time-timing”), etc. Various behavioral insights are summarized and policy implications are extensively discussed.

The dissertation consists of eight chapters: (1) “Introduction”, (2) “Literature review”, (3) “Pandemic-responsive methodologies”, (4) “Capturing temporal dynamics of behavioral and psychological adaptations to COVID-19”, (5) “Influences of preparedness and correlated cultural and psychological factors on choice behaviors in response to COVID-19: A case study on travel mode choices”, (6) “Differences of social contacts by activity settings before and during the COVID-19 pandemic and associational analysis”, (7) “Investigation of multi-faceted social contact decisions under the impacts of COVID-19: Joint analysis of contact mode choices and the number of contacted persons”, and (8) “Conclusions”.

The applicant already published the following peer-reviewed papers. Among the published papers, there are two first-authored papers and two papers in journals with an impact factor (web of science).

- 1) **Ding, H.,** & Zhang, J. (2021). Dynamic associations between temporal behavior changes caused by the COVID-19 pandemic and subjective assessments of policymaking: A case study in Japan. *Transport Policy*, 110, 58-70. (**IF=6.173**) (Chapter 4)
- 2) **Ding, H.,** Zhang, J. & Zhang, L. (2022). Psychological/cultural risk factors and influenza-induced preparedness associated the travel mode choices under the impacts of COVID-19: Analysis based on a mixed hybrid choice model. *Transport Policy*. (**IF=6.173**) (**Under review: Passed the first round of review (major revision) - Resubmitted on December 12, 2022**) (Chapter 5)
- 3) **Ding, H.,** Zhang, J., Zhang, L., & Feng, T. (2023). Social contact for daily activities during the COVID-19 pandemic in six developed countries, Book chapter for *Research Handbook on Transport and COVID-19*. Edward Elgar Publishing. (**Accepted on December 5, 2022**) (Chapter 6)
- 4) **Ding, H.,** Zhang, J. (2023). Dependence analysis of social contact behaviors under the impacts of COVID-19 based on a copula approach. *Science of the Total Environment*. (**IF=10.753**) (**Under review: Submitted on January 9, 2023**) (Chapter 7)
- 5) Zhang, J., Zhang, R., **Ding, H.,** Li, S., Liu, R., Ma, S., ... & Hayashi, Y. (2021). Effects of transport-related COVID-19 policy measures: a case study of six developed countries. *Transport Policy*, 110, 37-57. (**IF=6.173**) (for supporting Chapters 1 & 2)

With the above evidence, the applicant is judged as sufficiently qualified to be awarded the degree of “Doctor of Philosophy in Engineering”.