Life-Oriented Behavioral Research for Urban Policy
Chapter 1

Life-oriented Approach

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Abstract

This chapter first emphasizes the importance of understanding human behavior for urban policymaking and discusses the motivations of proposing the core approach in this book, i.e., the life-oriented approach. Second, it describes the life-oriented approach, which argues that interdependencies are essential to understand various life choices. Third, this chapter summarizes the contents of each chapter included in this book.

Keywords: life-oriented approach, cross-sectoral approach, decision-making process of public policy, human behavior, quality of life, interdependencies, life choices, inter-behavioral analysis

1. Introduction

Human activities have resulted in various changes to the land, water, and air as well as the society throughout several million years (Wolman, 1993). Such changes involve many urban issues, such as urban sprawl, excessive land use, traffic congestion and accidents, housing issues, health issues, air pollution, and wastes. Currently, more than half of human beings are living in urban areas across the whole world. People pursue happiness. Many people believe that cities provide more opportunities to them for enjoying their life than rural areas do, and living in cities makes them experience a happier life. However, such belief is not always consistent with the reality in actual life. Accordingly, urban policies need to address the above issues for not only protecting natural environment, but also improving people’s quality of life (QOL) (e.g., life satisfaction and happiness).

Various life choices (or consumption in life) affect the QOL, which has been investigated with respect to various life domains, such as residence, neighborhood, health, education, work, family life, leisure and recreation, finance, and travel behavior (e.g., Zhang and Xiong, 2015). People usually perform different life choices under various constraints (e.g., money, time, and capability), and accordingly, they have to trade off between life choices, resulting in various interdependencies. In this sense, it is not desirable to incorporate different life choices separately in policymaking. Generally, the decision-making process of public policy consists of four stages: (1) agenda formation, (2) policy adoption, (3) policy implementation, and (4) policy review (Fawcett et al., 1988). No matter how important an issue related to a specific life choice may be, if its importance cannot not be recognized at the stage of agenda formation together with other issues, policies for resolving the issue cannot be made.

Urban policy decisions usually involve stakeholders from different vertically divided sectors. To date, criticisms of unsuccessful cross-sectoral policies have been directed at the lack of better institutional governance (e.g., Stead, 2008; Cole et al., 2010). However, I would like to argue that the lack of interdisciplinary approaches, including the life-oriented approach proposed in this book, is more serious. As argued by Shafir (2013), the success or failure of public policy heavily depends on the understanding of human behavior. Policy resources are limited. Policy makers in different sectors need to know whether their sector-oriented policies improve a certain aspect of the QOL, but worsen other QOL aspects, if they do not collaborate with each other. In many case, collaboration between governmental sectors may generate synergic effects. Therefore, it is important for policy makers and other stakeholders to communicate with each other based on a common language.

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As shown in the Shafir’s (2013) book, economics, especially, behavioral economics has been the dominating discipline to provide behavioral foundation for public policy. Economics (or behavioral economics) can provide convincing behavioral evidence on the understanding of a single life choice. Unfortunately, it seems that interrelated life choices are not the interest of economists (or behavioral economists), or at least economists (or behavioral economists) have not made enough effort to develop frameworks for analysis of interrelated life choices.

Motivated by the above-mentioned practical issues and research gap in literature, this book presents the life-oriented approach, which is an interdisciplinary approach and expected to serve as a common language for supporting cross-sectoral policy decisions.

2. The Life-oriented Approach

![Fig. 1.1 An image of interdependencies across life choices.](image)

Needless to say, the life-oriented approach also argues that understanding human behavior is essential to urban policymaking. More importantly, it argues that people’s decisions on various life choices are interdependent. Such interdependencies are essential to understand human behavior. A specific life choice may result from and/or affect other life choices. Figure 1.1 conceptually illustrates this argument. Note that the life domains shown are just some examples to classify the various life choices. As stated by Zhang (2015), there are various domain-generic and domain-specific reasons for such interdependencies. Improving the QOL, meeting various life needs, and sharing household resources (e.g., income, time, and living space) are some examples of common reasons across life domains. Health concerns are a part of domain-specific reasons why residential and travel behavior and health promotion behavior may be interrelated. Environmental concerns are another example of domain-specific reasons why residential and travel behavior and in-home energy consumption behavior may not be independent of each other. Various life choices also affect QOL. Better job may allow people to earn more money, which is essential to QOL. Good habits of performing physical exercise regularly and eating healthier foods usually result in good health conditions, which are a core element of health-related QOL. To many people, living in a good house is a symbol of social status, which is also indispensable for QOL. Especially, Chapter 2 of this book presents empirical evidence on interdependencies across life domains and effects of life choices on QOL. Interdependencies across life domains revealed in Chapter 2 can be
illustrated in Figure 1.2, showing an extremely complicated pattern of interdependencies. Readers can find more evidence from both literature review and empirical studies in other chapters.

![Figure 1.2 Revealed relationships between 80+ life choice variables (Data collected in Japan in 2010)](image)

Behaviorally, the ignorance of and inability to understand a specific life choice by considering the influence of other life choices may lead to a biased estimation of that specific life choice and behavioral changes in response to policies affecting it. In this sense, understanding of a specific life choice should not be constrained by the boundary of any single discipline. The ignorance of and inability to understand interdependent life choices may result in a failure of consensus building for policy decisions. Behavioral interdependencies between life choices suggest the necessity of cross-sectoral policies for QOL improvements. The life-oriented approach aims to serve as a common decision support method for various public policies and as a platform for negotiations across sectors and stakeholders.

3. Outlines of Chapters

This book consists of 18 chapters, including this chapter. Chapters 2 ~ 18 provide an extensive review of existing studies in various disciplines and present rich insights for future research.

First, Chapter 2 provides empirical evidence on the existence of interdependencies across an extensive set of life choice variables based on data from a cross-sectional survey, a panel survey, and a life history survey implemented in Japan in 2010 and 2014. It examines the interdependencies from both static and dynamic perspectives. It further investigates relationships between QOL and life choices. Especially, evidence on cross-domain interdependencies and future expectations has long-lasting reference values.

Second, Chapter 3 focuses on the concept of lifestyle, which is usually defined by subjective factors (e.g., values and attitudes) and/or objective factors (including various life choices), and illustrates how this concept has been defined and analyzed in several major research disciplines. Related to the lifestyle, existing literature has often targeted ownership and usage of cars and various in-home appliances as well as residential behavior. In these two decades, information and communication technologies (ICTs) have become indispensable in many people’s daily life and shaped their lifestyles in
a different way from other technologies. In addition, many people prefer healthy lifestyles, in which not only daily activities but also non-daily activities (especially tourism) play important roles. With these considerations, Chapter 4 investigates car dependence in people’s life, where new evidence on the decline in young people’s car ownership and usage is presented based on a longitudinal dataset of household expenditure in Japan, together with descriptions about shared mobility, life-oriented studies, social exclusion, and behavioral changes. Chapter 5 examines ownership and usage of cars and various in-home appliances as well as residential location choices from the perspective of energy consumption, where an efficiency analysis is conducted for clarifying minimum energy consumption for a household, ABC factors (i.e., attitude, belief, and consciousness) and self-selection issues are emphasized, and an integrated dynamic energy consumption modeling system is introduced. Chapter 6 explores the association between ICT and people’s life in terms of lifestyles, impacts of ICT on society and long-term decisions, urban form, travel behavior, shared mobility services, and the future of cities as well as autonomous vehicles (AVs). Chapter 7 describes health-oriented behavioral research by focusing on lifestyle habits, travel behavior (commuter paradox, active travel, etc.), park use, residential environments, and urban infrastructure, where health-related QOL is captured in terms of not only physical aspects, but also mental and social aspects; the famous stage of change model and the global movement of healthy cities are introduced. Chapter 8 treats life-oriented tourism behavior research by classifying tourism behavior into the following dimensions: information search and use, the social aspect, resources, the spatial aspect, activity participation and the temporal aspect. Literature review is given with respect to each dimension, followed by review about integrated tourism behavior models, relationship between tourism behavior and other life choices, tourism and quality of life, and determinants of tourism behavior. Importance of qualitative research in the future is emphasized.

Third, several typical behavioral issues related to urban policies are targeted in Chapters 9 – 12. Chapter 9 deals with women’s labor participation, where literature review is given with respect to women’s labor participation associated with land use, transport, health, family, and leisure life as well as QOL, followed by a case study in Japan based on a recursive multiequation system. Focusing on the elderly mobility, Chapter 10 describes hierarchy of travel needs; discusses interdependencies between mobility and other life domains, mobility and well-being; argues the importance of measuring freedom to achieve and the components of mobility; and re-assesses policy goals on mobility of the elderly. Chapter 11 looks at risky behaviors in life, especially focusing on young people. It first describes risky behaviors in daily life and then review major theories (Heinrich’s domino model, problem behavior theory, social development model for representing antisocial behavior, life history theory, lifetime utility theory). It further illustrates young people’s risky driving by reviewing studies on driving tasks; risk homeostasis theory; applications of theory of planned behavior; influences of family, peers, and passengers on young people’s risky driving behavior; avoidance driving; mood during driving and driving purpose; driving and nightlife; and self-driving cars and young people. Chapter 12 examines how people adapt their life to natural disasters by taking Bangladesh as a case study area. General literature review is given with respect to adaptation behaviors in terms of intercity travel and general life adaptations, followed by descriptions about a stated preference based case studies in the context of floods and cyclones.

Fourth, several major methodological issues related to life choices are explored, including general biographical research (Chapter 13), a new modeling method to represent various mobility decisions over the life course (Chapter 14), multi-dimensional household timing decisions in daily life (Chapter 15), theories of behavioral change (Chapter 16) and an application to explore migration in association with other life choices (Chapter 17). Concretely speaking, Chapter 13 describes the concept of mobility biographies (especially focusing on habits, domains of the life course, and transitions and key events in the life course), highlights mobility socialization and linked lives, argues that the importance of context, and discusses consequences for research. Chapter 14 supports the lifetime utility theory and applies the concept of multilinear utility to capture biographical interactions between residential, car ownership, household structure, and employment/education mobilities. An operational model is derived and its effectiveness is confirmed based on data from a life history survey collected in Japan in 2010. Chapter 15 deals with time use from the perspective of timing decisions, which have been an ill-defined issue in literature. It applied the concept of timing utility to represent household timing decision model with coupling constraints, first-order sequential correlations, nonnegative timing and sequencing constraints, where activities are distinguished between shared and nonshared activities.
and both observed and unobserved interdependencies are endogenously represented. Chapter 16 highlights life trajectories and choice models and especially describes promising individual-level modeling approaches for modeling lifecycle decisions and lifecycle driven behavioral changes, including discrete choice models with lifetime utility and social dynamics, attitudinal models, technology acceptance model, norm activation model, and value belief norm theory. Even though migration behavior is targeted, in fact, Chapter 17 presents an example how to capture behavioral changes across life domains. It argues that a behavioral change in one life domain may not only result from socio-psychological factors (e.g., behavioral intention, attitude, social norm, and perceived behavioral control) related to that domain, but also occur conditional on behavioral changes in other life domains.

Finally, Chapter 18 further discusses future research directions to promote the life-oriented approach for supporting various urban policies.

4. Summary

Urban policy serves for improving people’s QOL. Both academic literature and actual policy practices suggest that such improvements rely heavily on better collaboration of different sectors. The life-oriented approach has various advantages for supporting urban policy over existing behaviorally oriented approaches. Such advantages are illustrated in each chapter. The life-oriented approach also has various unresolved research issues, which are discussed in each chapter as well. The life-oriented approach attempts to break the boundaries of various existing disciplines about human behavior research from a much broader perspective. The contents of the remaining chapters suggest that such cross-boundary efforts are not only important, but also feasible. Studies based on the life-oriented approach could be motivated by not only policy decisions, but also purely behavioral research. Policy makers may learn how to make cross-sectional policies by drawing on insights from such an interdisciplinary research, while researchers may learn how to resolve their single-discipline research issues by borrowing ideas from other disciplines in an integrated and consistent way.

This book introduces the life-oriented approach in a comprehensive and consistent way. It not only provides extensive literature review on interdependencies across various life choices in a variety of disciplines, but also presents new insights from new survey data based on new research methods. This book further illustrates inter-behavioral analysis frameworks with respect to various life domains based on case studies in different countries, along with a rich set of future research directions.

References

Chapter 2

Empirical Evidence of Behavioral Interdependencies across Life Choices

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Abstract

This chapter presents empirical evidence of behavioral interdependencies across more than 80 life choice variables, based on data collected from a cross-sectional survey, a panel survey, and a life history survey in Japan, respectively. Similar analyses are further conducted with respect to more than 20 indicators of life satisfaction and happiness, as a whole life and by life domain. Very complex patterns of cross-domain and within-domain interdependencies are revealed by using statistical modeling approaches. This is the first study in literature to clarify behavioral interdependencies across life choices from such a comprehensive way. Analyses also suggest a variety of research issues for promoting the life-oriented approach.

Keywords: life-oriented approach, life choices, life domain, happiness, life satisfaction, state dependence, future expectation, life history survey, panel survey, Japan

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Chapter 3

Lifestyles and Life Choices

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Abstract

This chapter focuses on lifestyles and life choices. Although there is not a formally agreed definition of it, the ‘lifestyle’ concept – derived from sociology – might be useful in life choice studies. It highlights the importance of ‘soft’ factors next to the traditional ‘hard’ factors (e.g., demographic, socioeconomic and spatial characteristics) while explaining life choices. This chapter first provides a structured overview of the ‘lifestyle’ concept in terms of definitions and measurement methods. Two broad perspectives exist: (1) a mechanistic lifestyle approach considering a behavioral typology of activity and time use patterns, and (2) a sociographic lifestyle approach focusing on a behavioral orientations – values, attitudes and preferences – and a latent factor motivating behavior patterns. The second part of this chapter reviews how the ‘lifestyle’ concept has been used in life choice studies so far. It specifically focuses on applications in the research domains of demography and family studies, geography and urban studies, and transportation. Both perspectives are used interchangeably without little evaluation of the usefulness of various formal lifestyle classification systems. Moreover, most life choice studies consider ‘lifestyles’ as static and given, and not as something dynamic that might change over time. This calls for a more longitudinal perspective on the interaction between lifestyles and life choices. Other avenues for further research include the integration with a social network and a geographical perspective.

Keywords: lifestyles, life choices, mechanistic and sociographic approaches, dynamics, interactions, sociology, demography, family studies, geography, urban studies, transportation

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Chapter 4
The Car-dependent Life

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Abstract

This chapter focuses on car dependence in people’s life. The authors first describe a new phenomenon about the decline in young people’s car ownership and usage by providing additional facts and insights based on literature review and a case study in Japan. Especially, the case study in Japan uses data from a longitudinal national household expenditure survey and confirmed that car ownership and usage decisions in Japan are more or less associated with decisions about other household expenditures. Second, recent research on shared mobility is reviewed from the perspective of smart use of cars. Third, existing studies on cars from the life-oriented consideration are described by looking at shopping behavior (both store-shopping and online shopping) and general purchasing behavior as well as electric vehicle ownership and usage. As for electric vehicles, the influence of lifestyle is explored. Fourth, car ownership and usage for an inclusive society are discussed, where low-income persons, children, and the elderly are focused on. Fifth, behavioral changes toward less dependence on car from a long-term perspective are illustrated. Finally, discussions on car dependence from the life-oriented perspective are given.

Keywords: car dependency, monetary expenditure, lifestyles, young people, shared mobility, behavioral change, inclusive society, travel time budget, positive utility of travel time

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Chapter 5

Household Energy Consumption Behavior

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Abstract

This chapter deals with not only household car ownership and usage, but also ownership and usage of in-home electric and electronic appliances from the perspective of energy consumption. Household energy consumption is an outcome of a series of life choices including end-use ownership, end-use efficiency, end-use usage, time use, expenditure allocation, residential location choice, employment choice, and household structure decisions. It is related to all life domains and also has externalities such as impacts on health. Life-oriented methodology that considers the potential interactions between household energy consumption and other life choices would be more appropriate to investigate this issue. To that end, this chapter sheds light on three fundamental questions related to household energy consumption: (1) how much is the minimum energy demand for households in the context of their life choices? (2) how do factors of attitude, belief and consciousness work on residential choice and household energy consumption? (3) how can household energy demand be actively managed by designing life choice-oriented interdisciplinary policies? In this chapter, the externality of household energy use on health is discussed as well.

Keywords: in-home and out-of-home energy consumption, integrated behavior model, energy demand management system, waste energy, re-bound effects, self-selection effects, health

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Chapter 6
ICT-dependent Life and Its Impacts on Mobility

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Abstract

The rapid development of information and communication technology (ICT) is revolutionizing people’s lives in many ways. Among their numerous impacts, ICT solutions allow for more flexibility in individuals’ schedules, and provide new alternatives for the organization of work, social and recreational activities. Several types of relationships are possible between the adoption of ICT and travel behavior, leading to the eventual complementarity with, substitution of, modification of, or neutrality with travel. Modern technologies play an important role in affecting individuals’ long- and medium-term decisions as well as numerous daily choices. The application of information and communication technologies is also behind the introduction of new shared mobility services that were barely imaginable only a few years ago. These services expand the set of travel options available to individuals. The effects of the availability and adoption of these technologies on individual behaviors are still largely unclear. They will likely cause long-lasting impacts on travel patterns, vehicle ownership, and life organization.

Keywords: information and communication technology, lifestyles, mobility, travel behavior, shared mobility services, complementarity, substitution, modification, neutrality, urban form, connected and autonomous vehicles

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Chapter 7

Health-related Life Choices

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Abstract

Health has been of growing interest for professionals in a variety of disciplines, including engineers and urban planners among many others. Urban and transport policies may be interlinked with health at many levels, directly or indirectly, because connections between life choices and health may be bidirectional. A healthy life means a balanced condition of not only physical health, but also mental and social health. However, existing studies have mainly focused on the physical health and ignored the mental and social aspects in people’s health-related quality of life (QOL). Therefore, this chapter makes a review of health behavior and health-related QOL with respect to health lifestyle habits, health promotion activities, active and non-active travel behavior (active travel refers to walking, bicycling and partially refers to use of transit systems), park usage, residential environment, and urban infrastructure. Lifestyle habits are reviewed by focusing on smoking, alcohol drinking, eating, sleeping, social contacts, and commuting, etc. Various future research issues are finally discussed.

Keywords: physical health, mental health, social health, lifestyle habits, stage of change model, commuter paradox, active travel, residential environment, infrastructure, healthy city

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Chapter 8

Life-oriented Tourism Behavior Research

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Abstract

Tourism as an extension of people’s daily life is becoming prevalent in today’s society. However, understanding tourists is still a demanding and changeable task, and the preference structures and decision patterns of different tourists are complex. Research on tourism behavior can help address these issues. In recent decades, research on tourism behavior has attracted considerable attention and has become a cornerstone of tourism market strategy and action. Tourism is not a transient behavior, but is repeated over time and is interrelated with daily life. To understand tourists’ lifestyle and decision-making processes, long-term observations of tourism behavior are needed. A life-oriented approach cannot ignore tourism behavior because it is an important part of life. This chapter analyzes recent research on tourism behavior, summarizes the pertinent concepts, characteristics, determinants, and shortcomings in existing studies on tourism behavior, and suggests directions for future research.

Keywords: tourism behavior, spatial and temporal choices, social influence, integrated behavior model, generation theory, medical tourism, health, quality of life, qualitative research

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Chapter 9
Influence of Land Use and Transport Policies on Women’s Labor Participation and Life Choices

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Abstract
Across the whole world, gender inequality issues are serious, mainly because of traditional thinking about the role specification within a household. Within the context of urban policy, relevant studies are very limited. This chapter argues that women’s labor participation should be further promoted for not only achieving gender equality, but also realizing sustainable economic development. Based on an extensive literature review, a case study in Japan was conducted by considering women’s family responsibilities (especially, childcare), associated work–family conflict, time-related work–leisure conflict, and stress-related work–health conflict jointly. To examine women’s decisions on labor participation associated with other life choices, a recursive multiequation system is used. Applying such a modeling system have several advantages: (1) to identify the barriers to women’s labor participation in Japan after controlling for the effects of land use, transport, and life cycle stages; (2) to clarify the factors for women’s good quality of family life, leisure life, health life, and quality of life as a whole; and (3) to provide cross-sectoral policy implications for women’s labor participation and promotion of quality of life and work–life balance.

Keywords: women, childcare, labor participation, life choices, conflicts in life, land use, transport, family life, leisure, health, life cycle stages, quality of life, Japan, casual modeling

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Chapter 10

Mobility of the Elderly

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Abstract

This chapter briefly overviews studies on mobility of the elderly with a particular focus on its conceptualization, measurement, and evaluation. The role of mobility in the everyday life of the elderly is first explored through putting mobility discourses into a broader context. After clarifying hierarchy of travel needs, interdependencies between mobility and other life domains, and the linkage between mobility and well-being are discussed. Moreover, policy aspects related to mobility of the elderly are emphasized, aiming to draw on the potential conflicts that exist among different perspectives including social welfare, economy, and urban planning. Finally, this chapter points out the needs for conducting further cross-cutting empirical studies, establishing a clearer linkage between conceptual framework and empirical framework, developing a simple and standardized method to collectively show the importance of social aspects of transport, and exploring the potential changes in the role or position of the elderly in future.

Keywords: the elderly, mobility, achieved mobility, capability approach, hierarchy of travel needs, well-being, measure of achievement, measure of freedom to achieve, social exclusion

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Chapter 11

Risky Behaviors in Life: A Focus on Young People

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Abstract

This chapter describes risky behaviors in daily life, especially focusing on young people. Driving while intoxicated, speeding, and illegal drug use are examples of risky behaviors, which often compromise health, quality of life, or life itself. People perform some risky behaviors consciously while they do others unconsciously. This chapter first depicts some typical theories of risky behaviors, including Heinrich’s domino model, problem behavior theory, social development model, life history theory, and lifetime utility theory. Next, it illustrates young people’s risky driving by reviewing risk homeostasis theory, applications of theory of planned behavior, influences of social networks and other persons, avoidance driving, mood during driving and driving purpose, driving and nightlife, and self-driving cars. Literature review suggests that there are some common factors (not only psychological factors, but also life choices and various habits formed in daily life) affecting different types of risky behaviors, suggesting that risky behaviors tend to covary and effects of one risky behavior may spill over to influence other risky behaviors. These imply that measures to prevent a risky behavior should jointly target multiple risky behaviors based on an integrated approach over a long period.

Keywords: young people, problem behavior, social development model, life history theory, risky driving behavior, avoidance driving, self-driving cars, influences of family and peers

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Chapter 12

Adaptation of Behavior to Overcome Natural Disasters

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Abstract

This chapter deals with how people adapt their lives to natural disasters, such as flood, cyclone, extreme weather events, earthquake, and sea level rise. With the changing global climate, the disasters would appear more frequently and seriously. However, it is still uncertain where the disasters will occur nearby personal daily activity areas, and how great the impacts on human life will be. Surprisingly, literature review suggests that relevant studies are very limited, especially in the context of developing countries. Targeting Bangladesh, one of the most vulnerable countries in the world to climate and the sixth most vulnerable to floods, this chapter describes three case studies on people’s adaptation behaviors under the impacts of different flooding and cyclone scenarios in future by focusing on intercity travel behavior, job and residential location choice behavior, and tourism behavior respectively. Various findings are derived, which are useful to help identify the barriers to the adoption of adaptation measures, the roles of different stakeholders in implementing adaptation measures, and the directions of adaptation measures in the future.

Keywords: climate-related disasters, flood, cyclone, Bangladesh, adaptation behavior, residential behavior, intercity travel, tourism behavior, stated preference survey, discrete choice models

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Chapter 13

Mobility Biographies and Mobility Socialisation – New Approaches to an Old Research Field

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Abstract

This chapter investigates mobility biographies and mobility socialization, which are especially useful to capture long-term life choices. In the past decade, a research approach has been developed to better understand daily mobility by framing it in the context of individual life courses, their path dependencies and their social, economic and space-time links. This chapter briefly reviewed this approach and its origins. The concept of mobility biographies is introduced first, including a discussion of the role of routines (habits), life domains linked to mobility, and key events and transitions in the life course. A further step puts individual mobility biographies in a wider social context by referring to the concepts of socialization and linked lives. The importance of historical context for studying mobility biographies is briefly sketched. The chapter concludes with an outlook on future research.

Keywords: mobility socialisation, mobility biography, life events, habits, learning process, linked lives, travel behaviour, path dependence, transition, context, qualitative-hermeneutic approach

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Chapter 14

Biographical Interactions over the Life Course: Car Ownership, Residential Choice, Household Structure, and Employment/Education

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Abstract

This chapter focuses on interdependent decisions on car ownership mobility, residential choice mobility, household structure mobility, and employment/education mobility over the life course. This study represents the above interdependencies based on a multilinear utility model and make an empirical study based on data from a web-based life history survey. Each of the four mobility domains is simply described as a set of episodes. Dependent variables in the model are the duration of each episode between two consecutive changes in each mobility domain. By using the multilinear utility functions, interepisode interactions within each mobility domain and interdomain interactions are simultaneously incorporated. The survey was conducted in 2010 and 1,000 households provided valid data, and may well be the first life history survey with such a large sample size and comprehensive coverage in the transportation literature. Estimation results show a competitive relationship between the duration of episodes in the same domain, while a synergistic relationship between the duration of episodes in different domains exists. Furthermore, the biographical interactions in the life course are found to be substantial, contributing almost 95% to total household utility, implying that mobility decisions are likely to be intertwined over the life course.

Keywords: biographical interactions, car ownership mobility, residential choice mobility, household structure mobility, employment/education mobility, cross-/within-domain interactions

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Chapter 15

Household Time Use Behavior Analysis: A Case Study of Multidimensional Timing Decisions

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Abstract

This chapter investigates household time use behavior by especially focusing on timing decisions on interdependent daily activities. Timing decisions on various life choices have been unsatisfactorily presented in literature. At best, such timing decisions have been presented based on survival analysis, which has various attractive statistical features, however, ignores decision-making mechanisms. This chapter argues that the utility of activity participation and trip-making behavior changes over time, and timing decisions within a given period of time interact across activities/trips and across household members. This study derives the optimal timing functions for both nonshared and shared activities/trips by different household members, where interdependencies among activities/trips over time and household’s coupling constraints are endogenously represented. The applicability of the developed model is empirically examined. Behavioral implications of analysis results are finally discussed.

Keywords: time use, timing utility, coupling constraints, intrahousehold interaction, interdependencies among activities/trips, shared activities/trips, sequential correlation, sequencing constraints

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Chapter 16
Models of Behavioral Change and Adaptation

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Abstract
This chapter explains and summarizes models of behavioral change and adaptation, which have received less application in the life choice analysis associated with urban policy. Related to various life choices, life trajectory events are major decisions with a relatively long-lasting impact, such as demographic events, job change and purchase of major resources such as a house and a car. These life trajectory events may co-vary over time and lead to dynamic changes in activity-travel repertoires. Such decision problems have hitherto been predominantly modeled in urban and transportation science using classic discrete choice models. However, because such decisions differ from daily choices, other modeling approaches may be more beneficial. The authors present discrete choice models with lifetime utility and social dynamics, attitudinal models, technology acceptance model, norm activation model, and value belief norm theory for modeling lifecycle decisions and/or lifecycle driven behavioral change.

Keywords: life trajectories, theory of innovation diffusion, lifetime utility, social dynamics, attitudinal model, technology acceptance model, norm activation model, value belief norm theory

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Chapter 17

Behavioral Changes in Migration Associated with Jobs, Residences, and Family Life

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Abstract

This chapter first explores migration-related urban issues and then illustrates migration dynamics. It further points out the limitations of existing migration theories. To overcome the shortcomings of existing theories, this chapter presents a new analysis framework for migration, where multiple life choices, including migration, are simultaneously incorporated by expanding the theory of planned behavior. To empirically confirm the applicability of the new framework, a web-based questionnaire survey about migration associated with employment, dwellings and child rearing was implemented in Japan in 2015. This is the first study to reveal such interrelated behavioral changes in multiple life domains from the perspective of decision-making process. Such a theoretical reformulation could provide more scientific insights into cross-sectoral policies of migration than existing theories.

Keywords: migration dynamics, microlevel theory, life course, mobility biographies, behavioral changes, behavioral interdependencies, theory of planned behavior, Japan

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Chapter 18
Future Perspectives of the Life-oriented Approach

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Abstract

This book has attempted to provide a general picture about the life-oriented approach by focusing on major life choices. In reality, there are so many types of life choices and it is therefore impossible to cover all of them in a single book. Here, first, this chapter makes brief discussions on research issues related to several life choices excluded from the previous chapters. Second, relevance of the life-oriented approach to cross-sectoral planning and policy as well as general public services is described. Third, future research from the perspective of making use of Big Data is illustrated. Fourth, it is discussed how to put the life-oriented approach into practice. Finally, this chapter describes future perspectives of the life-oriented approach in general, as a truly scientific system.

Keywords: interdependencies, life-oriented behavior analysis system, cross-sectoral policy, public services, Big Data & open government data, citizen participation, non-reductionism

5. Additional Remarks on Life Choice Studies

The previous chapters have provided rich insights into analyses of various life choices; however, there are still more life choices that need to be explored within the life-oriented approach. Here, I provide additional discussions on the following life choices that are also important to urban policy: residential behavior, time use, expenditure, habitual life choices, social network, and general travel behavior.

First, residential behavior involves long-term decisions (e.g., where to reside, whether to purchase a house or rent, and how long to reside), that may have long-lasting impacts on many other life choices. Residential behavior has been widely studied together with travel behavior, where residential self-selection is a core behavioral phenomenon. A dominating argument is that residential self-selection comes from two sources: attitudes and sociodemographic traits. This argument would be true if decisions were made only on residential choice and travel behavior (Zhang, 2014). In reality, residential and travel behavior are a part of people’s life choices. Accordingly, omission of information about other life choices may also result in the existence of residential self-selection and it is therefore necessary to extend the decision boundary of residential and travel behavior research. In line with such consideration, Zhang (2014) proposed a new framework to analyze residential and travel behavior research considering the influence of residential self-selection issues by treating other life choices as the third source of the self-selection, based on the life-oriented approach. Zhang (2014) further presented several promising methodologies how to represent the residential self-selection under this new framework from static and dynamic perspectives, including multiple discrete-continuous choice modeling, modeling of future expectation and other behavioral dynamics, and choice models with flexible error structures.

Second, even though everybody has the same amount of time per day (24 hours), per week (7 days), and per year (365 days), income levels of individuals with the same attributes are not the same. This means that the economic productivity of time use differs between individuals. Time is a kind of tradable resource in the market (e.g., housekeeping and chauffeur services). It is worth investigating what such features of time use mean for urban policy research, considering the interdependencies between activities and their connections with monetary expenditure. Unfortunately, little has been done

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with respect to joint analysis of time use and expenditure behavior (Zhang, 2009). Because money and time are resources for decisions on many other life choices, it is not unrealistic to assume that decisions on monetary expenditure and time use are associated with other life choices. There are two types of monetary expenditure: utilitarian and hedonic expenditure. Utilitarian expenditure is for problem solving and hedonic expenditure for obtaining better affective experience (or enjoyment of life). It is expected that the more expensive a purchase, the higher its dependence on other life choices. On the other hand, spending time at a certain place usually involves energy consumption. Due to limited time, people have to trade off not only between in-home activities and out-of-home activities, but also between different in-home activities. In this sense, examining household energy consumption needs to treat in-home and out-of-home activities within the same analysis framework (see Yu and Zhang, 2016), and types of in-home activities should be distinguished for the analysis of energy consumption. In line with such considerations, interestingly, a new type of energy-saving system has just been developed in Japan\(^1\). This system can automatically control lights and air conditioners in response to the resident’s activity patterns at home, which are automatically detected based on the use of various electronic appliances via the in-home network. Considering that rebound effects cannot be ignored during the deployment of such new technology (Yu and Zhang, 2016), it is worth clarifying whether such a new energy-saving system can actually reduce the overall household energy consumption. People usually spend one-third of a day sleeping, mainly at home. As sleeping time is a core indicator of a healthy lifestyle, health behavior and energy consumption behavior might be interrelated as a consequence of time use. Furthermore, there is a so-called solitude issue related to those young people who dislike face-to-face communication with others\(^2\). In recent years, people have been able to communicate with others via social media such as Facebook and LINE, without leaving home. This trend is especially prevalent among young people. Positively speaking, social media have dramatically improved people’s lives. However, the above solitude issue is surely a serious social issue, which needs more research.

Third, in reality, some daily activities are habitual (e.g., Gärling and Axhausen, 2003; Wood and Neal, 2009). People may perform different habitual behaviors over a different length of time. For example, employed persons usually commute daily on weekdays; people may go shopping mainly on weekends; tourists may repeat their overseas travel annually or over several years. It is necessary to clarify how to represent time-use behavior involving habits. If two or more habits are behaviorally connected, their representation will become even more challenging. For this purpose, the time window for their representation should be clarified, because once the time window is extended, some habitual behaviors may be no longer habitual. A habitual activity may constrain participation in other daily activities. Once the living environment is changed, the habitual activity may become nonhabitual, consequently resulting in a changing interdependence structure among activities. In line with such considerations, long-term observation of various life choices is required. There are some time use related policies; for example, flexible working hours, flexible work contracts, and telework. Changes in time use patterns may have various impacts on people’s daily life, not just the time spent on other activities. For example, in the case of telework, it may also lead to the reconsideration of residential functions and even the location of residence. Furthermore, people may participate in some activities more frequently in specific seasons. For example, people may enjoy more physical activities during spring and fall than during summer and winter. During spring and fall, more people may like to take a bicycle than during summer and winter. These seasonal activities may affect people’s time use patterns in different ways.

Fourth, people live in a networked society. People’s social networks are formed with a reflection of interpersonal bonds (e.g., Easterbrook and Vignoles, 2013), needs in life (e.g., Lin et al., 2014; Tetreault et al., 2014), personality and attachment styles (e.g., Yaakobi and Goldenberg, 2014), etc. Various studies on social networks have been done in link with subjective well-being (e.g., Pinquart and Sorensen, 2000; Cheng et al., 2009; Huxhold et al., 2013), lifestyles (e.g., Baghaei et al., 2011; Sandra et al., 2011), residential choice (e.g., Magdol, 2000; Viry, 2012; Oishi et al., 2013), travel behavior (e.g., Schönfelder and Axhausen, 2003; Larsen et al., 2006; Kowald et al., 2013), health (e.g., Li and Zhang, 2015; Mohnen et al., 2015; Rook, 2015), time use (e.g., Moore et al., 2013; Chang and Hsiao, 2014).


tourism (e.g., Larsen et al., 2007; Kim and Tussyadiah, 2013) and so on. For example, in case of travel behavior research, one fundamental question is how to understand the associations between social networks, interrelated life choices, and daily activity-travel behavior. Social networks may mold various life choices and the resulting daily activity-travel behavior on one hand, while participating in various life activities allows people to get to know new members living in different locations on the other. Additionally, better accessibility supported by transport network and services may help people to form new social networks, which may provide them with more opportunities and enlarge their choice sets for enjoying a better life. However, such an effect may not appear soon and should be therefore captured over a longer period. In recent years, social networking via the Internet has become much more popular than ever before, which brings in more complexities. Better understanding of social networks needs more detailed information about people's social connections; however, such survey effort inevitably causes serious privacy issues. To avoid privacy issues, Big Data of social networking should be cleverly utilized based on innovative data fusion techniques. Furthermore, it might be worth exploring joint optimization of urban service networks and social networks, considering the social dimension of sustainable urban development.

Last but not the least, travel behavior should be reexamined from the viewpoint of life considerations. For this, trip-making behavior can be classified into two types: one is made reluctantly and the other willingly. In the former case, a trip maker has to be patient with the trip (e.g., commuting) and sometimes he/she may do something (e.g., reading, listening to music, and surfing the Internet) to relieve boredom (i.e., multitasking during travel). In the latter case, the trip maker may feel excited at the thought of participating in the subsequent activities (e.g., leisure and/or tourism activities) or may feel the travel is helpful because he/she can make use of the travel time to prepare for the subsequent activity (e.g., a business meeting). The willingness of trip making may also result from the liking of travel. The utility of trip making in the former case should be at least nonpositive and in the latter case at least nonnegative. In summary, positive utility derived from travel may result from three sources: travel liking, multitasking during travel, and expectation of activity participation after travel. Recently, studies of subjective well-being in the context of trip making have been attracting ever-increasing attention from travel behavior researchers. In particular, considering that the ideal travel time of many people is not zero (e.g., Redmond and Mokhtarian, 2001), the preferred distance from home to each type of daily facility has been under-researched. More studies are required, especially for specifying the proper size of a city and further realizing the transformation to sustainable urban forms. Life choices affect travel mode choices while on the other, there are more travel mode choice variables influencing other life choices. The activity-based approach is a powerful tool for understanding travel behavior, but the effects of daily travel behavior on life choices are greatly under-researched. Thus, the accumulative effects of daily travel behavior on various life choices from a long-term perspective should be examined, considering the long-term nature of transportation planning. Furthermore, more life choice variables should be introduced to the travel behavior research framework. However, the paradigm shift from the activity-based approach to the life-oriented approach does not simply suggest extending the decision boundary. Rather, it suggests a new way of thinking about transportation planning and policy with better consensus building. The availability of transport access to various facilities and locations is essential to people's life. In line with this consideration, it is important to promote further the study of social exclusion (e.g., Stanley and Vella-Brodrick, 2009; Stanley et al., 2011) in the context of transportation. For this purpose, the life-oriented approach could provide a new type of “compass” to guide social exclusion studies by paying more attention to various life domains with respect to different population groups in various contexts (e.g., aging society, depopulated areas, and natural disasters).

6. Relevance to Cross-sectoral Policymaking

The life-oriented approach may serve well for integrated planning and policies. For example, integrated land use and transportation planning needs a better understanding of people's decisions on activity participation at different locations and the resulting travel behavior. Healthy city planning should focus on improving not only people's lifestyle habits, but also their living environment that can facilitate their participation in more outdoor physical activities and social contacts with others. Low-carbon urban planning highly relies on how much people will live a low-carbon life in terms of transit-oriented and
non-motorized travel behavior, residential behavior, energy consumption behavior, and eating behavior, etc. Inclusive transport policy needs to eliminate various exclusions, such as physical exclusion, geographical exclusion, economic exclusion, time-based exclusion, fear-based exclusion, and space exclusion (Church et al., 2000), which may prevent some people’s access to various services for supporting their daily lives. Incorporating various interdependencies in life choices may not only allow the above examples of integrated planning and policies to be made in a more accurate way, but also enhance their effectiveness to improve people’s quality of life in a better way, than ignoring the interdependencies as done in independent planning and policies. In case of transportation planning, the activity-based approach (e.g., Axhausen and Gärling, 1992; Algers et al., 2005), arguing that travel is a derived demand from activity participation, has been proved to be superior to the traditional trip-based approach. Barton (2009) stated that modern planning was invented in response to inhumane living conditions in the 19th century cities; however, in the last century the connection was lost and argued that land use planning should aim to the improvement of health and well-being. In line with this argument, Barton (2009) concluded, based on extensive literature review, that health and well-being is affected by physical activity, active travel, recreational activity, and diet, which may be further influenced by land use planning at the neighborhood level. Barton further concluded that health is closely tied with economic sustainability (in terms of jobs and income), social sustainability (in terms of the reduction of inequality, building inclusive and supportive communities), and environmental sustainability.

Fig. 18.1. A conceptual illustration of the life-oriented behavior analysis system

Considering the complexity of various interdependent life choices and the importance of reflecting them into urban policymaking, it may be worth developing a kind of life-oriented behavior analysis system (e.g., Figure 18.1). Conceptually, the system may consist of (1) database of life choices, (2) behavioral modeling modules, and (3) policy modules. The life-oriented approach requires more data than existing single discipline. Innovative survey methods should be developed by trading off between respondents’ answering burdens and rich information that is required to represent various interdependencies across life choices. In this regard, it is necessary to package various life choices and conduct each packaged survey separately. Meanwhile, existing data (especially Big Data) related to various life choices should be cleverly applied to supplement the use of the surveys required by the life-oriented approach. The above database (1) contain various life choices surveys conducted at the individual and household level, Big Data, and supply-side data of various urban services. The modeling
modules cover behavioral models with respect to various life choices by explicitly incorporating the cause-effect associations connected by various inputs and outputs. The policy module includes policy evaluation, implementation, and monitoring. The evaluation should focus on not only QOL but also various externalities caused by people’s life choices (the externalities may also influence QOL), the implementation covers laws, economic measures, technological development, and enlightenment and so on, and the monitoring should pay more attention to behavioral changes in various life domains.

7. Relevance to General Public Services

Globally, people are continuing to migrate to cities. Governments, firms and other organizations provide various services to them. All these stakeholders usually claim that they aim to improve people’s quality of life (QOL); however, their claims often hold within their own territories, reflecting their own interests and benefits. In many cases, different stakeholders understand people’s QOL and its associations with various life choices differently. Governments have taken up many responsibilities, such as insuring public safety, guaranteeing essential infrastructures, promoting economic development, protecting the environment, and providing services to each individual citizen with respect to various life domains (e.g., residence, job, education, health, leisure and recreation, and travel). Different public services are usually accessible at different departments, partially because of specialty and efficiency of service provision. A particular public service may be associated with two or more life choices, while a particular life choice may need supports from two or more public services. In this sense, integration of and collaboration among public services are not a choice, but a “must” from a citizen’s point of view. In other words, public services must be citizen-centered. This argument is consistent with that of the life-oriented approach, which aims to support various policy decisions involving interdependent life choices.

For example, One-Stop-Government, the integration of public services from a citizen’s point of view, is a solution to realize citizen-centered public service provision (e.g., Wimmer, 2002; Kunstelj and Vintar, 2010). Under the one-stop paradigm, all of a citizen’s business can be completed in a single contact, either face to face or via other means (e.g., phone, fax, Internet). To make the one-stop scheme possible, Tambouris and Spanos (2002) proposed an architecture for integrated public service delivery based on life events in the context of e-government, where service is handled by front-office, mid-office, and back-office in a sequential way. They discussed how such an architecture could service for one-stop government not only within one public authority, but also across all public authorities. They further identified three areas that need technical innovations: central portal (a central access point to information and services), service integration (for creating and invoking composite services), and service coordination (to locate all essential information for service provision). Composite service refers to the workflow, inputs, and outputs of all elementary and basic services that are required to fulfill one life event.

Consumer’s point of view is indispensable to the provision of any service. Even though studies on services can be traced back to the era of Adam Smith, service science, formally advocated by Innovate America in 2004, attaches the most importance to the value co-creation between consumers and service providers (Maglio et al., 2010). Service science argues the necessity of paradigm shift from goods-dominant logic to service-dominant logic, where the former looks at economic exchange in terms of the production and distribution of units of output, while the latter suggests that market exchange is the process of parties using their specialized knowledge for mutual service provision benefits, i.e., value co-creation. Service science also claims that it aims to improve people’s QOL and consumer modeling is at its core. In this sense, the life-oriented approach is consistent with the idea of service science. Different from private services, public services need to pay more attention to social welfare of the whole society. Therefore, future research should figure out how to make use of the life-oriented approach to realize various value co-creations during the process of public services provision.

8. More General Perspectives

The life-oriented approach deals with behavioral research for urban policy. Considering behavioral complexities involved in the life-oriented approach, it is necessary to conduct more studies by directly
focusing on various urban issues, rather than just treating behaviors themselves. To understand life choices for urban policy, clearly, it is not a wise idea to focus on a specific discipline, for example, economics, psychology, or sociology. It is not a realistic choice, either, to develop a unified theory that can accommodate various interrelated life choices within the same modeling framework. Nevertheless, theoretical studies should be further promoted for scientifically guiding our understanding about various life choices. Society is sometimes too complex for models. For this reason, more qualitative research is required to derive some useful theories. Meanwhile, it is still worth applying various statistical approaches and simulation models to capture the complicated interdependencies involved in various life choices. More studies on the life-oriented approach should be implemented by exploring how to cultivate it as a new major behavioral research stream for supporting more general public policy decisions. Dialogue among researchers from various disciplines should be further promoted.

Use of open government data
Data collection is a troublesome task in promoting studies on the life-oriented approach, because it needs respondents to answer many questions about their life choices, some of which may be sensitive to privacy issues. To understand why people make a particular choice in their life, questionnaire surveys are still a powerful tool. As stated by Alexopoulos et al. (2014), governments are one of the largest producers and collectors of data in many different domains. Recently, a number of open government data movements sprung up around the world, with transparency, data reuse, and participatory governance as three major reasons (Ubaldi, 2013; Attard et al. 2015). Examples of open government data include education, employment, industrial information, health, housing, transport and infrastructure, energy and environment, meteorological/weather information, geospatial information, crime and justice, government accountability and democracy, governmental budget, and public administration, etc. Currently, there are more than 30 countries with open data portal sites. Research on how to make use of open government data based on the idea of the life-oriented approach should not be neglected.

Relevance to understanding of citizen participation
Democratic public policymaking requires citizen participation (or public involvement), which ideally needs to represent the whole population. However, there are various constraints to citizen participation. Tonn and Petrich (1998) summarized five constraints in the United States: work-related, consumerisms, social capital, personal, and built environment constraints. Work places major constraints on the amount and quality of people’s discretionary time and attention. Consumerism as a lifestyle (e.g. time spent watching television, shopping, and engaging in entertainment activities) takes time away from community pursuits and also requires time and effort to produce sufficient income to maintain the lifestyle. Social capital is a prerequisite for citizenship; however, population mobility, time pressure, lack of leadership, and economic stratification lead to decline in social capital. Many people fear public speaking because of enormous pressures to conform, threat of psychological harm, and their intuitive feeling about social tendencies towards intolerance. Built environment refer to land use, building designs, and transportation systems. The loss of great good places and the retreat of people to their homes only exacerbates difficulties in building social capital. Car- rather than people-oriented land uses may discourage people to participate in community activities because of longer travel time. Constraints related to work, lifestyle, and built environment are closely related to individual time use of both activity and travel, and social networking. To overcome any constraint may require a concerted effort to simultaneously overcome several constraints. Coglianese (2006) further revealed that the more significant barriers to citizen participation are cognitive and motivational, even with more sustained efforts to create user-friendly tools for participation. Ravensbergen and VanderPlaat (2009) argued that poverty is a serious barrier to citizen participation of low-income people, and Irvin and Stansbury (2004) stated that one ideal condition for enhanced citizen participation is that citizens have enough income to attend meetings without harming their ability to provide for their families. The life-oriented approach has potential to contribute to a better understanding of citizen participation for value co-creation between public service providers and citizens. Relevant studies should be promoted in the future. If

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citizens can voluntarily engage in citizen participation, achieve a sustainable society will not be a dream.

Toward a truly scientific system
There are many disciplines dealing with human behavior. As argued by Thomas S. Kuhn (1962), any discipline may face a crisis of paradigm shift when abnormal events that it cannot address come to accumulate. Such a crisis has motivated the proposal of the life-oriented approach. As argued by the famous psychologist Kantor (1958), scientific systems must aspire toward validity, significance, and comprehensiveness (Fryling and Hayes, 2010). Validity refers to internal consistency or lack of contradiction. Significance describes the relationship of an individual scientific system to others. When an individual scientific system shares the meta-assumptions of others, it is considered significant. Validity is a prerequisite for significant interactions with other scientific systems, but validity itself does not assure significance. Comprehensiveness means an adequate account of all of the events that fall within the scope of the scientific system. Importantly, comprehensiveness is only valued when it is construed within a system that is both valid and significant. From the validity viewpoint, the authors of this book have shown that there are complicated and diverse “chicken-and-egg” interdependencies across life choices, suggesting the necessity of treating multiple life choices within a unified analysis framework. The life-oriented approach can serve as such a unified framework. Considering interdependencies across life choices meets the requirements of significance and comprehensiveness. Reductionism has been widely adopted in various scientific research treating complex systems. Life choices are such a complex system. Reductionism decomposes a complex system into elements and assumes that as long as characteristics of each element can be revealed, the whole system can be understood (e.g., Sawyer, 2002). However, because of interdependencies across life choices, it is not desirable to treat different life choices separately. In other words, reductionism has its serious limitations in representing interdependent life choices. Therefore, it is necessary to promote studies on the life-oriented approach based on the idea of non-reductionism (e.g., Sawyer, 2002) that treats interdependent decisions as one cohesive unit of analysis. Studies based on non-reductionism may contribute to develop the life-oriented approach as a truly scientific system.

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