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# **Environment-Behavior Research for Advanced Design in the Open Transformation of Urban Housing Blocks in China**

題名：中国における都市住宅ブロックのオープン化に関する環境行動デザイン研究

**By: Jiayu HUANG**

## **Summary of the present study**

China's urbanization rate has accelerated with the accompany of massive housing developments and continuous growth of urban traffic pressure. The gated housing block of a large area has been developed in this background and has become the dominant residential form in China. The wide existence of these housing blocks is deemed to have caused traffic problems such as low density and limited connectivity of road networks. Due to above situation, a guideline was released in February 2016 by China's central government to transform gated housing blocks into open patterns for addressing "obvious issues" and "urban ills". This guideline aims to make traffic networks intensive and unclog urban roads by removing bounding walls of gated housing blocks and connecting internal roads with urban roads. However, the transforming of boundary walls and internal roads have changed the physical environment of housing blocks such as the outdoor space that residents have been accustomed to and has affected environmental behaviors correspondingly. Meanwhile, after a gated housing block was reconstructed to an open, without solid barriers, such as boundary walls and gates, it is a further question how residents adjusted their territorial cognition and behaviors

(including the ways of space occupation and the attitude toward the penetration of external space by outsiders) to adapt to the different environment.

This dissertation consists of 8 chapters as following:

Chapter One presents an overall introduction of the background and status of housing blocks, including disputes and differences in the definition of research objects, and the concepts of open housing blocks and gated housing blocks are elaborated separately. In addition, this section also describes the research hypotheses, research questions, research scope, research structure, research purposes and significance of this study.

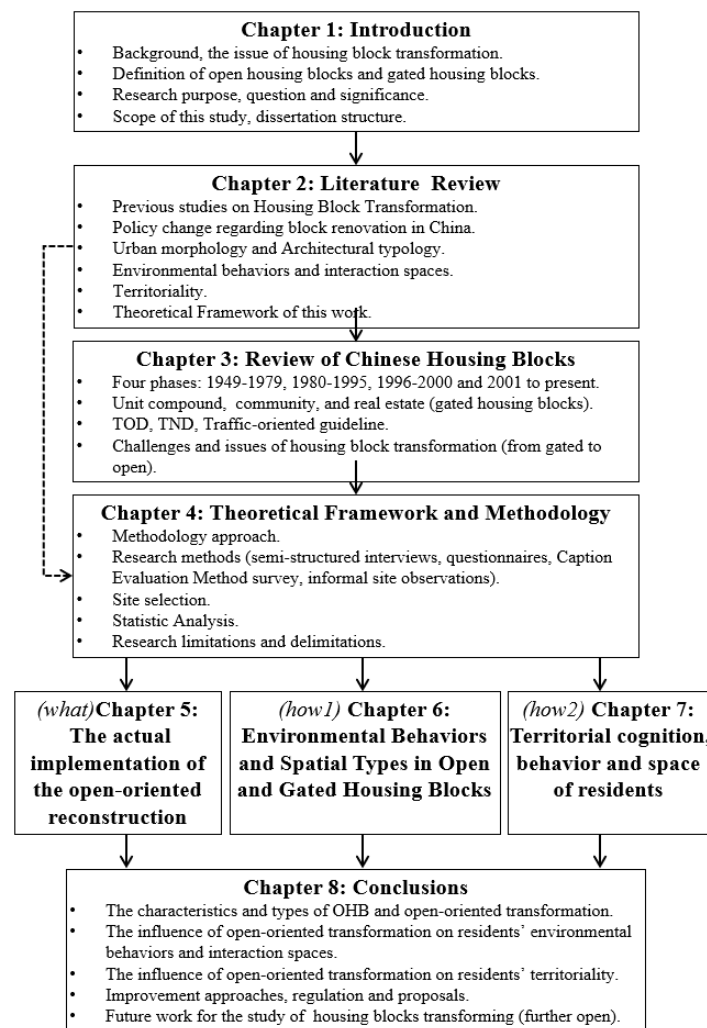


Fig.1. Structure of this thesis

Chapter Two gives a literature review from two aspects, it includes the implementation of transformation policy and literature of theoretical approaches related to typo-morphology, environmental behavior and territoriality. The first part introduces policies in detail: the first opening policy in 2016 and the further opening policy in 2018. The second part introduces existing theoretical approaches and also develops these approaches to be appropriate for this research.

Chapter Three reviews the development process of residential areas in China and explains the distinctive characteristics of China's residential development in each phase. For example, it was influenced by the neighborhood model of the Soviet Union at the beginning of its birth, and later formed its own real estate concept in 1980, and experienced two housing system reforms at the end of the 20th century. All of the above processes are deeply related to the existing gated housing blocks and the reasons for the open transformation.

Chapter Four is about the materials and methodology. It first figures out the identification of case studies in this research through sampling and screening. After that, qualitative and quantitative research methods are introduced in detail. They consist of investigating methods and analyzing methods. For the investigation methods, Questionnaires, Semi-structured interviews, Likert scale, Visual Encounter Survey method, Behavior Mapping, Snapshot were conducted. The analyzing methods include Typo-morphology, Factor analysis, clustering analysis, etc.

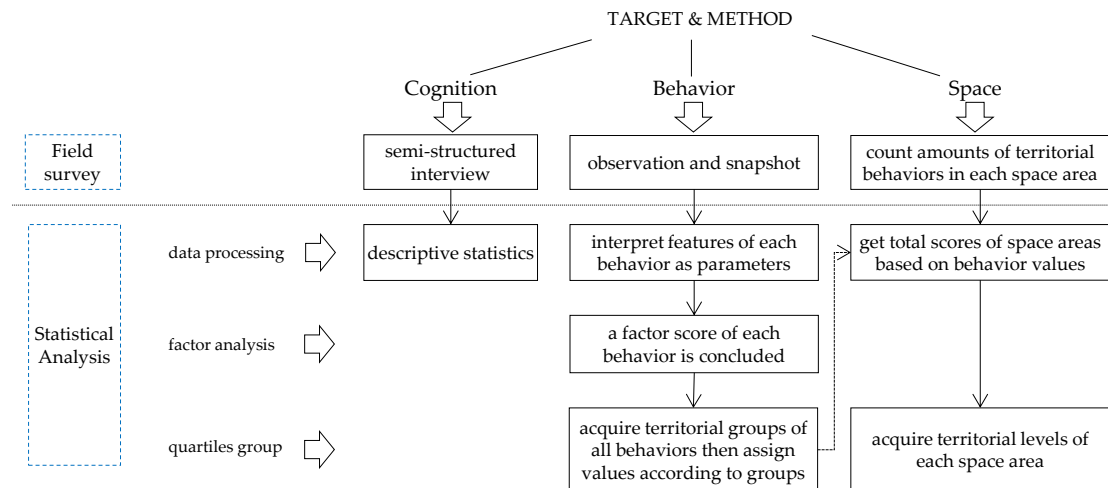


Fig.2. Analyzing Methods

Chapter Five clarifies “what the open housing block is” from the definition of a special and specific context and from the typology way. This primary question includes three branches: 1. what kind of housing blocks have been reconstructed? 2. What methods have been used to reconstruct these housing blocks? 3. For different types of housing blocks, are the types of reconstructing methods different? The answers to these questions form the main analysis part of this article, and they will be shown in sub-chapter under Chapter 5. The answers to these three sub-questions can be combined to reveal what is the OHB and its actual implementation. In the reconstructed cases that have been found, the scale, plot and building layout of these housing blocks and their relationship with cities are diverse. According to these different basic conditions, the methods of the open-reconstruction are also not completely similar. Therefore, it is necessary to analyze the types of these housing blocks and the types of reconstruction methods, and to discriminate what transformation methods were adopted/applied in different types of housing blocks. After this, to extract the commonness and typical transformation methods of each type of residential areas, in order to provide other cities

a reference for the subsequent reconstruction.

Chapter Six indicates how open housing blocks influence residents in environmental behaviors and their interaction spaces. From perspectives of spatial types and environmental behaviors, this chapter compared an open housing block (which is reconstructed from gated one) with a comparable original gated housing block. The Behavior Mapping Method was used to capture environmental behaviors in two housing blocks; factor analysis and cluster analysis were used to extract spatial characteristics and classify spatial types; and finally, differences between the open housing block and the gated housing block were shown by comparing the distribution of environmental behaviors in each space type. The results indicate that the presence or absence of the enclosing walls affects the division of space types and environmental behaviors in housing blocks.

Chapter Seven introduces how open housing blocks influence residents in territoriality. Residents have territorial cognition with different hierarchies and conduct corresponding behaviors in the outdoor space of housing blocks through sharing space and facilities. This mechanism stems from human needs and might be influenced by physical environmental elements. To understand this effect, especially after a guideline for transforming existing gated housing blocks was enacted in China, this chapter compared the territoriality of open and gated housing blocks from the view of cognition, behavior, and space through combined methods. Interview, snapshot, and observation were conducted to capture the situation of these three dimensions, then they were evaluated and grouped by factor analysis and quartiles. Obtained results in the open

housing block were found to be inferior to that in the gated case. The conclusion was drawn based on the above that there are remarkable differences between open and gated housing blocks on the intensity of residents' territorial cognition, the level and quantity of their territorial behaviors, and the distribution as well as continuity of the territorial space.

Chapter Eight summarizes the conclusions of this study, re-examines the significance of the research, gives proposals on the strategy of open transformation, and discusses the issues involved in further opening transformation in the future. This paper reviews the definition of the open housing block, analyzes its spatial types and summarizes the existing open transformation methods. After knowing what is OHB, this paper further discusses and summarizes its impact on residents. After this, come up with an integrated proposal on the strategy of open transformation to improve residents' environmental behaviors.

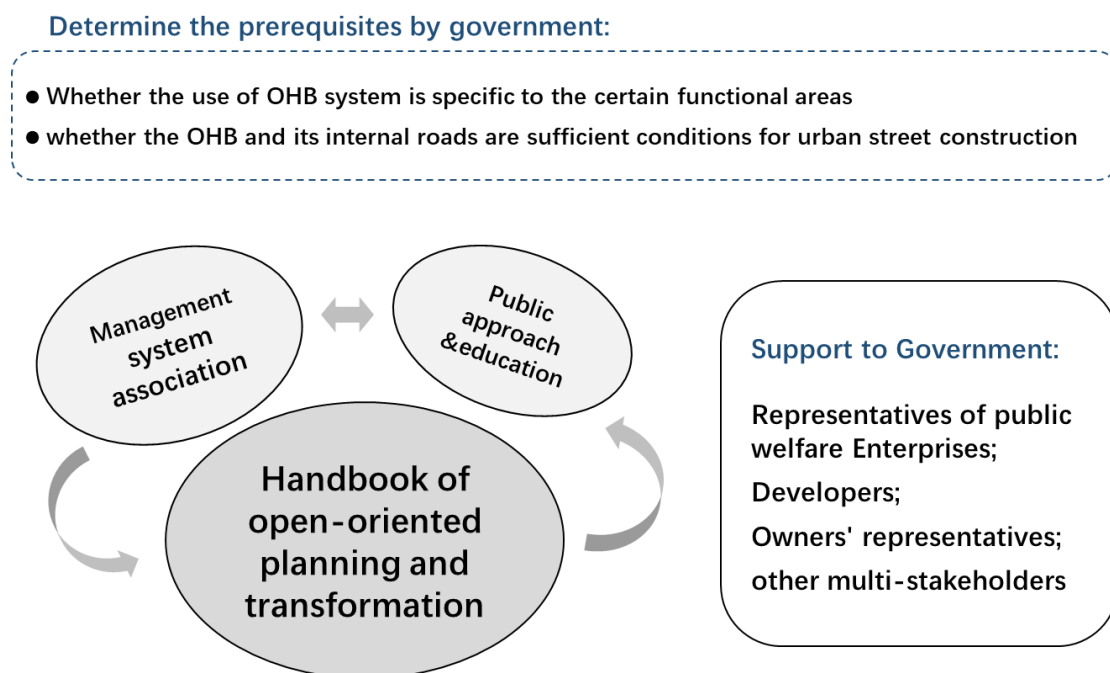


Fig.3. Recommendations and Proposals of Open housing blocks

1) proposal for the design and planning: according to the diverse situation about scale, plot and building layout of target housing blocks and their relationship with cities, develops appropriate methods of open-reconstruction for different types. 2) proposal for management: the organic coordination of planning measures and safety management should be considered comprehensively in open housing blocks, and the management of public space should also pay attention to its accessibility and availability. 3) proposal for public approach and education for residents: cooperation between government and social organizations to create communication channels of OHB system policy to promote policies and relevant information to people. In fact, the process of promotion and transformation of open housing blocks in China didn't pay enough attention to residents' opinions and participation, while the cognition and demands of residents are precisely the keys to promoting and improving the transformation. After a traffic-oriented guideline changed residents' familiar living space, how could they expanding their attributes outward and interacting with outdoor space as well as maintain or improve living sustainability in a more open environment are questions worthy of our consideration.