

書院造とパリのアパートマンの空間構成手法に関する比較研究

-スペースシンタックス理論を用いた分析-

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A Comparative Study on the Spatial Composition of
Japanese *Shoin-zukuri* and the Paris *Appartement*
—through the analysis method of Space Syntax Theory—

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1 Research goal

The interior spaces of the different dwelling forms, the Parisian *Appartement* and the Japanese *Shoin-zukuri*, share a common spatial configuration of "room passing through". In modern general dwelling, each room is basically accessed via a corridor, so there are few opportunities to experience this type of space in daily life. It is interesting to note that in the plan configuration of the *Appartement*, the axiality that arises when passing through each room and the circulation line coexist, while in the *Shoin-zukuri*, the circulation line and the "inwardness (*Oku*)" that is unique to our country coexist. In this dissertation, we will discuss the changes in the plans of these two types of dwellings with different historical backgrounds and social environments from the perspective of architectural morphology, which focuses on the existence of autonomous structures in the changes in plan configurations through a different perspective from that of historical architectural study. The background of this research is that the actual state of renovation of historical *Appartement* that are still lived in today is not widely introduced, and that there is not enough academic basis for considering the reevaluation of the *Shoin-zukuri* as a living space. The positioning and process of the study are as follows.

Hypothesis Formulation

The following hypotheses were set up for the houses with passage spaces, represented by *Appartements* and *Shoin-zukuri*.

- (1) The presence of a sense of inwardness (*Oku*) in the reception space.
- (2) Transformation of the flow line and circulation in the house according to the period.

(3) Separation of public and private spaces by visible areas.

Purpose of the Research

The purpose of this research is to verify the validity of the hypothesis by analyzing the plan of a dwelling with a passage space using the Space Syntax Theory.

Analysis Method

To verify these hypotheses, we use the Space Syntax Theory, which was developed at Bartlett University College London and is a well-established method for analyzing flow lines, to visualize the flow lines and visible areas in a dwelling, referring to the way rooms are used in previous researches. Specifically, a comparative analysis was conducted by visualizing the daily flow lines within the residence and the visible area from the "entrance" to the "high class salon in the back" or "high hierarchical room with *Tokonoma*" in parallel. Furthermore, the background of the common spatial characteristics of the two completely different spaces, the *Appartement* and the *Shoin-zukuri*, and the unique characteristics of each space were discussed.

Object of Analysis

In France, the aristocratic dwelling style that developed in the 17th and 18th centuries was transformed into the *Appartement*, the residential style of the bourgeoisie, in the late 19th century after the French Revolution and after the great remodeling of Paris by Haussmann. The structure of the room from the entrance to the salon in the back, as seen in the châteaux of the aristocracy, was inherited by later *Appartements*, and has become one of the distinctive features of the space. In modern times, this traditional dwelling plan has been further subdivided and used as a dwelling for ordinary Parisians. Since there are abundant data on the plan in the archives of Paris, the Parisian *Appartement* was chosen as one of the objects of analysis.

On the other hand, the *Shoin-zukuri* is a medieval Japanese dwelling style, which underwent a major change in the 14th century with the transition from an aristocratic to a samurai-centered society. In the *Shoin-zukuri*, the reception space became independent from the living space, and a characteristic change in space emerged with the approach to the *Jodan* (or *Ichi no ma*), and as the period progressed, a variety of dwelling plan patterns became apparent. In many existing examples, the original location and function have changed through relocation, remodeling, and reconstruction, but the basic spatial composition has not been lost today. In the past, Japanese residences also followed the *Shoin-zukuri* style, but today it is no longer the mainstream. Since there are many surviving examples, the Japanese *Shoin-zukuri*

was chosen as the second object of analysis.

The interior spaces of the Parisian *Appartement* and the Japanese *Shoin-zukuri* were analyzed using precise floor plan data obtained from a case study of 16 *Appartements* conducted while living in Paris and 104 examples of *Shoin-zukuri* in Japan. Through a precise comparative analysis of both dwelling forms, we were able to discover rules of spatial deformation that could be said to be rather universal, unaffected by social conditions or historical background.

Verification of Hypotheses

Based on the Space Syntax theory, we verified our hypotheses and obtained the following findings.

(1) The presence of a sense of inwardness (*Oku*) in the reception space.

→In the case of the *Appartement*, the inwardness (*Oku*) of the space is a circulation feature, while in the case of the *Shoin-zukuri*, the inwardness (*Oku*) of the space has an end point with an *Tokonoma* (alcove) or a *Chōdaigamae* (decorative doorway) in front of it.

(2) Transformation of the flow line and circulation in the dwelling according to the period

→In the case of the *Appartement*, the circulation was observed in the reception space, while in the case of the *Shoin-zukuri*, the circulation was observed in the living space.

(3) Separation of public and private spaces by visible areas

→In the case of the *Appartement*, the visibility of the reception space is high and the visibility of the living space is low. In the case of *Shoin-zukuri*, the visibility of living space tends to be high, and the visibility of reception space is low. (This was especially true for samurai *Shoin*, and this tendency was also observed in *Minka*.)

As a result of these comparative analyses, we were able to provide a theoretical basis for some of the conditions that a sustainable and adaptable architectural space should have in order to be livable even in the modern age. It is also hoped that the findings will serve as a theoretical basis for future renovations and conversions.

2 Summary of the chapters

This study consists of six chapters.

In Chapter 1, the historical background of the development of the *Appartement* and *Shoin-zukuri* is introduced and the apparent similarities between the two are discussed. The purpose of this chapter is to identify the precise points of focus for both types of spaces, and

to back up the historical background for the factors that led to the differences and transformations of each phase's form, which will be discussed in later chapters. It describes the characteristics of the *Appartement* and *Shoin-zukuri* spaces, and details literature reviews.

In Chapter 2, the floor plan of the *Appartement* and *Shoin-zukuri* will be databased and identify the function of each room from the literature. The use of tools for visualizing “flow lines” and “visible areas” using Space Syntax and the reading of the analysis results are also introduced. In addition, the method of Agent Analysis as a method of plan analysis of *Shoin-zukuri* is detailed.

In Chapter 3, we analyzed the plan of representative *Appartement* from each period of the 18th-19th centuries using Space Syntax to visualize the “flow lines” and “visible areas”. Each *Appartement* is divided into three phases in chronological order of construction: the first phase "before the French Revolution," the second phase "after the French Revolution ~ before Haussmann's remodeling of Paris," and the third phase "after Haussmann's remodeling of Paris." The usage of each room and its changes during each phase are also investigated to record the development process of the plan.

As an analysis process using Space Syntax, the following processes were conducted: 1) conversion to plan data and understanding of spatial functions, 2) visualization of “flow lines” using agent tools, and 3) visualization of “visible areas” using visibility graph analysis (VGA), and the results of the agent analysis and the VGA analysis were superimposed. The case study analysis is conducted by overlaying the results of the VGA analysis with the results of the agent analysis. In the *Appartement*, the service flow lines were arranged in parallel with the main movement lines, and the *Antichambre* (anteroom), played the role of connecting each room, making it clear that a semi-lattice structure was constructed throughout. This is one of the reasons why this plan structural form continues to be used to this day.

In Chapter 4, we conducted a plan analysis of the interior space using Space Syntax to visualize the “flow lines” and “visible areas”, mainly for *Shoin-zukuri* from the Muromachi to Edo periods. Each *Shoin-zukuri* is divided into three phases in chronological order of construction: Early Period 1, Momoyama/Kan'ei Period 2, and Post-Meireki Period 3. Next, as an analysis process using Space Syntax, 1) conversion to plan data and understanding of spatial functions, 2) visualization of “flow lines” using agent tools, and 3) visualization of visible areas using visibility graph analysis (VGA) were conducted, and finally, a case study analysis is conducted by superimposing the results of the agent analysis and the VGA analysis.

In the *Shoin-zukuri*, it became clear that a circular flow line on the semi-lattice can be seen in the daily living area, but that the inwardness of the axis structure is intended toward the more prestigious rooms. It is highly interesting to note the presence of a hybrid plan structural form in a seemingly simple plan configuration.

In Chapter 5, based on the visualization data in Chapters 3 and 4, the patterns of development of the plans of the *Appartement* and *Shoin-zukuri* are discussed as a typology, and the relationship of action from a social and cultural perspective is discussed. The major points of discussion in this chapter are (1) the inwardness (*Oku*) of the reception space and its experiential effects (by means of *Enfilade* or continuation space), (2) the change in shape of flow lines and circulation, (3) the separation of public and private space by visible areas, and (4) the sustainability and adaptability of the space. By comparing these four points, the spatial conditions of sustainability and the principle of plan change in the period classification were clarified.

In Chapter 6, based on the discussion in Chapter 5, the characteristics of the *Appartement* and *Shoin-zukuri* spaces were further investigated. First, the basic conditions for the spatial form to have sustainability and adaptability and the separation of public and private space are clarified with a diagram showing the location of the inwardness and circulation. Second, the relationship between the circulation lines and the *Antichambre*, and the characteristics of the *Antichambre* in the *Appartement* were clarified, and the function and the characteristics of *Chōdaigamae* and the arrangement of *Zashiki* in *Shoin-zukuri* were also clarified.