

A Study on the Signification of Prototype as Architectural Term in Chinese Architects' Design Theories

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1. Introduction

1.1 Background and Aim

Prototype, an idea showing something as origin, has been used as a foundation in architectural theories. Especially since the 18th century, various architects have made discussions centering around prototypes, such as Abbe Laugier and Le Corbusier. On the other hand, in the 20th century China, due to political and social unrest, only a few Chinese architects discussed the origins of architecture, and the concept of the prototype had not been formed until the 1970s.

Thanks to the reform and opening-up policy,¹⁾ Chinese architects have been able to get international thoughts after 1978 and started to explore the meaning of prototypes²⁾ as architectural terms from various aspects. Therefore, this thesis intends to clarify the signification of the prototype to sort out the identity of Chinese architecture.

1.2 Research Materials and Methodology

In order to set the criteria for selecting texts, design theories including the keyword “原型 -Prototype”³⁾ are extracted from "Architecture Journal" (建筑学报),⁴⁾ one of the most important architectural journals in China. The research example and process are shown in Fig.1. The content of the prototype mentioned by Chinese architects can be divided into **the Intention of the prototype** and **the Reference of the prototype**. The Intention of prototypes is about why architects look for prototypes for design. The reference of the prototype means the architect uses some references to illustrate prototype.

2. The Intention of the Prototype

Based on the KJ method, the results about the Intention of the prototype are mainly divided into [Architecture] and [Society]. (Fig 2)

[Architecture] means that architects use prototypes to discuss purely the content of architecture itself. It is mainly divided into Form(Fo), Function(Fu), Space(Sp), and Thought(Th). [Society] means that architects use prototypes to respond to the social voice. It is mainly divided into National Characteristic(Na), Regional Characteristic(Re), Institution(In), and Environment(En). According to the number of each content's frequency, Chinese architects are more inclined to discuss prototypes

from social perspective, especially from National Characteristic and Regional Characteristic.

3. The Reference of the Prototype

As mentioned above, Prototypes have a very diverse meaning in China. Its diversity is reflected in the variety of References. Through the KJ method, the result can be divided into 7 categories(Fig.3).

3.1 Classification of Reference

Classical Architecture <C-A> means an architecture with strict classical order. Anonymous Architecture <A-A> means buildings formed in response to the local climate and context. Modern Architecture <M-A> is a masterpiece and a new type of architecture since the modern architecture movement. Built Environment <B-E> is a group form that is buildings bind together in a certain area by a group of courtyard or hierarchy system. Culture and Spirituality <C-S> is the local customs and the medium of human spirit, such as behavior, books, and paintings. Item <I-T> means tools used by humans. Requirement <R-E> is the usage and site requirement that inspire architect. From the use frequency of each category, <C-A>, <A-A>, and <B-E> are playing an essential role in the reference of a prototype and they belong to the historical aspect.

3.2 Focus Point and Translation of Reference

In addition to classifying the References of the prototype by the property, Focus points of Reference are also examined. It can be divided into three parts (Fig.4). {Style} means they pay attention to certain factors that make the style. {Status} means they pay attention to a certain state of things. {Outline} means they pay attention to the physical form of things. Furthermore, we also analyze the relationship between References and Focus points(Fig.5). <C-A>, <A-A>, and <M-A> are all strong related to {Style}, and the most numerous is <A-A>. This means that when the reference is an architecture, we focus on the form of the element and space. Except for <I-T>, they are all related to [Status], the most of which is <B-E>. This means that the abstract organization and sense of majority references can be used as prototypes, especially <B-E>. Meantime, <I-T> and <R-E> are only related to {Outline}.

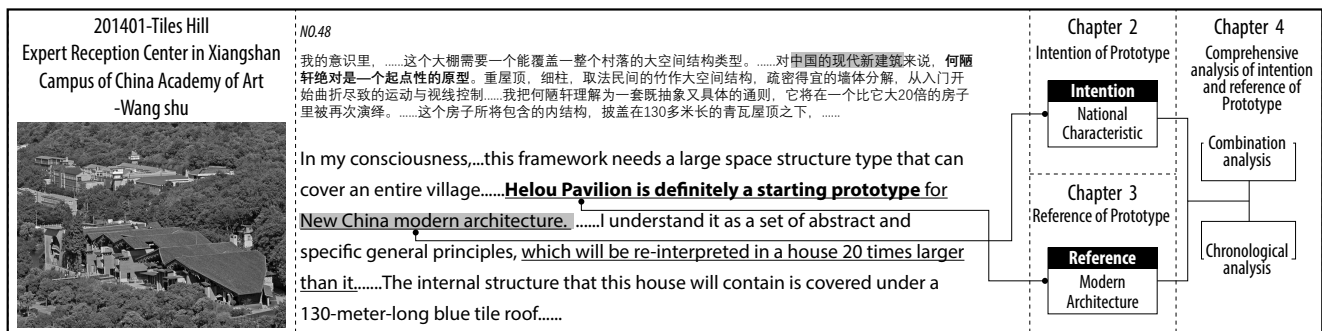


Fig.1 Example of Analysis

Category			Explanation	Example
Architecture 建築 33	Form	形態 12	The visual shape brought by the entity of the building such as appearance	53-...Using childhood toy "paper airplane" as the prototype, the horizontally spread "wings" form a stretched shape, ..., through the enclosure of "wings" and "fuselage", two public spaces are formed,
	Function	機能 5	the purpose of use and requirement, etc	11-...faced with no external feature.....The so-called "prototype" has nothing to do with the site, but only with the functional composition parameters, and has universal applicability.
	Space	空間 13	the perception bring by a three-dimensional phenomenon in the architectural entity.	5-Through the transformation and the scale manipulation of the "double-pitched hut" as Prototype, we create an indoor and outdoor space atmosphere.....
	Thought	思潮 3	Based on the viewpoints about modernism whether positive or negative	61-Glass box in the trees near the water becomes the original intention of the building, where people, architecture, and landscape become one. ...based on the classic glass box of modernism -Farnsworth Villa by Mies.
Society 社會 122	National Characteristic	國家性 45	Want to find something can represent Chinese characteristics	48.Helou Pavilion is definitely a starting prototype for New China modern architecture.....which will be re-interpreted in a house 20 times larger than it.....
	Regional Characteristic	地方性 53	Want to find something can represent regional characteristics	17-1...the local context is sorted out...Inspire each other through the regional characteristics ... the building creates new local values. The prototype is the academy architecture in Hunan, ... Yuelu Academy
	Institution	制度 9	In order to fulfilling regulations such as the Building Standard Law	15-Due to height restrictions, most of the building's usable space is below the horizon. ...,the independent courtyard was inspired by the image of Luis Barragan House and Studio is used as the architectural prototype.
	Environment	環境 15	Pay attention to Neighborhood, terroir, and nature-related content.	49-Such geomorphic features...become the geomorphic prototype for us to shape the landscape architecture...Create a building that blends with the texture of the ground and the surrounding landscape

Fig.2 Intention of Prototype

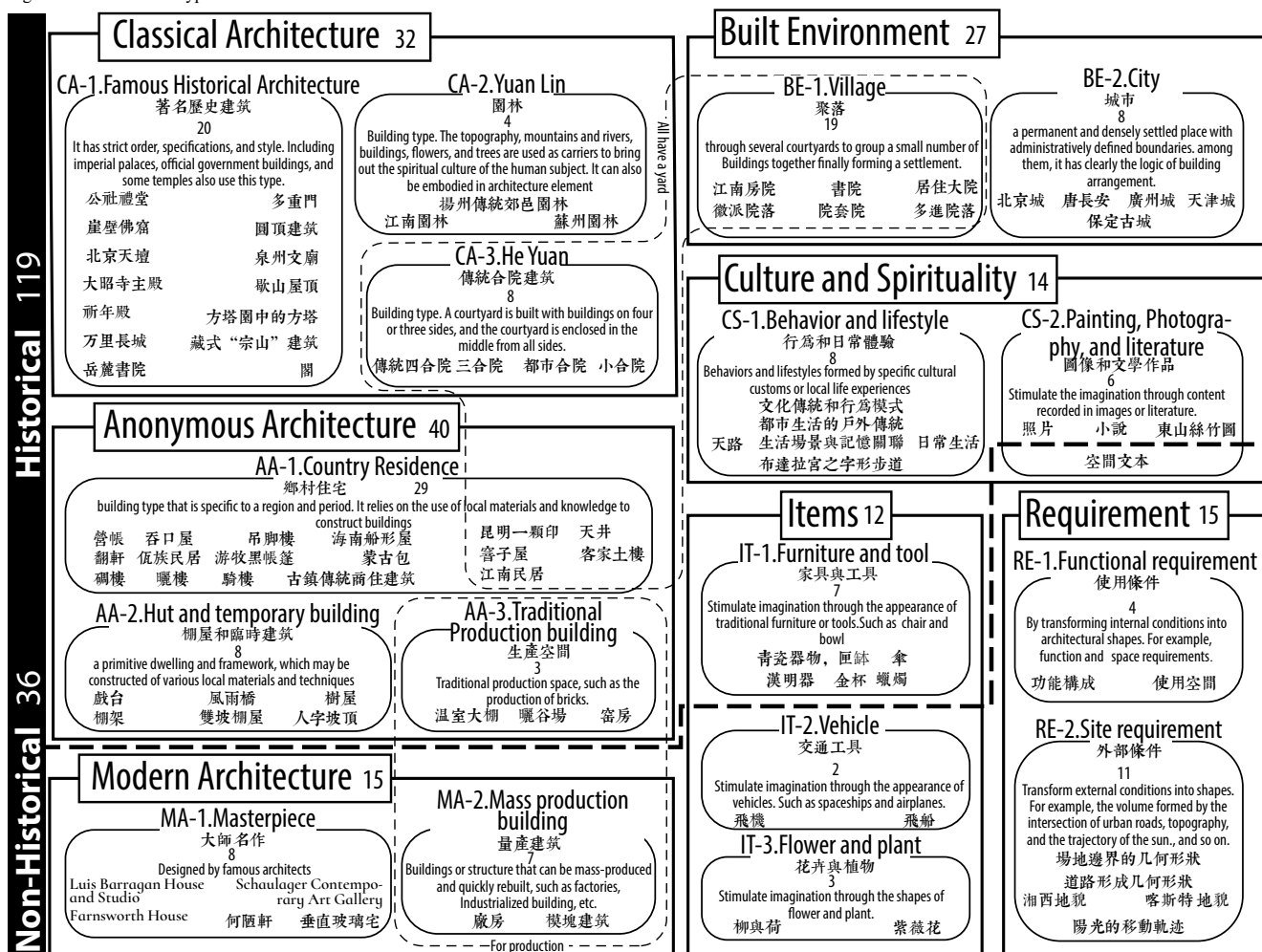


Fig.3 Reference of the prototype

Style		Status		Outline
Pay attention to certain factors that make the style, such as materials, structure, roof form, and spatial form		Pay attention to a certain state of things, such as the hierarchy organization or some abstract scenes.		Pay attention to the physical form of things, such as shape and contour.
Form of element	Form of space	Organization	Scenes	
50	27	45	18	24

Fig.4 Focus points of Reference

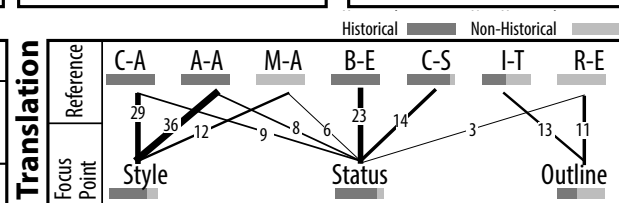


Fig.5 Translation between Reference and Focus point

In summary, the signification of the prototype not only means to reproduce a style or appearance but also to reconstruct a kind of internal organization logic or scene.

4. Comprehensive Analysis of Intention and Reference of Prototype

In this chapter, the Intention and the Reference of the prototype are combined and analyzed (Fig5). Furthermore, its chronological changes are analyzed (Fig6,7,8).

4.1 Integrated Analysis of Intention and Reference

The most proportion of Intention was occupied by National Characteristic and Regional Characteristic. Among them, <C-A> and <B-E> are the most popular reference to discuss National Characteristic. Especially, <<CA-1>> and <<BE-1>> are often used. This means that we mainly use famous historical architecture and villages formed by group courtyards to discuss it. On the other hand, <A-A> and <C-S> are the most frequently used to discuss Regional Characteristic. Among them, <<AA-1>> and <<CS-1>> are the typical reference. It means that when we discuss regional characteristics, we cited the country residences or local behaviors and lifestyles most. <M-A> is usually used in response to Institution, among which <<MA-1>> is often mentioned. <I-T> is often used to discuss the Form, and <<IT-1>> is cited the most. At the same time, <R-E> is usually used to discuss Environment and fully occupied by <<RE-2>>. This reflects the tendency to use a fixed Reference for Environment Intention.

To sum up, it is a comprehensive analysis of various References and Intentions, from which seven typical combinations can be sorted out, such as A to G.

It can be seen that the mainstream meaning of prototype understanding by Chinese architects is still related to the National and Regional characteristics, such as Type A, B, D, and E. In addition, some types reflect the meaning of prototypes about other Intentions, such as Form, Environment, and Institution. Such as Type C, F, and G.

4.2 Chronological Change of Intention

According to the contents of Fig.2, chronological changes of Intention are drawn in Fig.6.

Between 1978 and 1989, only a few architects talked about prototypes, which were related to the political and economic environment at that time. (RE) appear since the 1990s, and its ratio increased by year and keep stable after 2000. In contrast, the proportion of (Na) was relatively stable from 1990-2009 but declined after 2000. Furthermore, the ratio of [Architecture] aspects increased in the past 10 years.

To sum up, due to the rapid economic development and after China holding some international event. There are two shifts in the meaning of the prototype. First, it shifts from National Characteristics to Regional Characteristics. Second, it changes from a focus on the social aspect to the architecture aspect.

4.3 Chronological Change of Reference

According to the contents of Fig.3, chronological changes of Reference are drawn in Fig.7.

Firstly, The proportions of architecture (<C-A>,

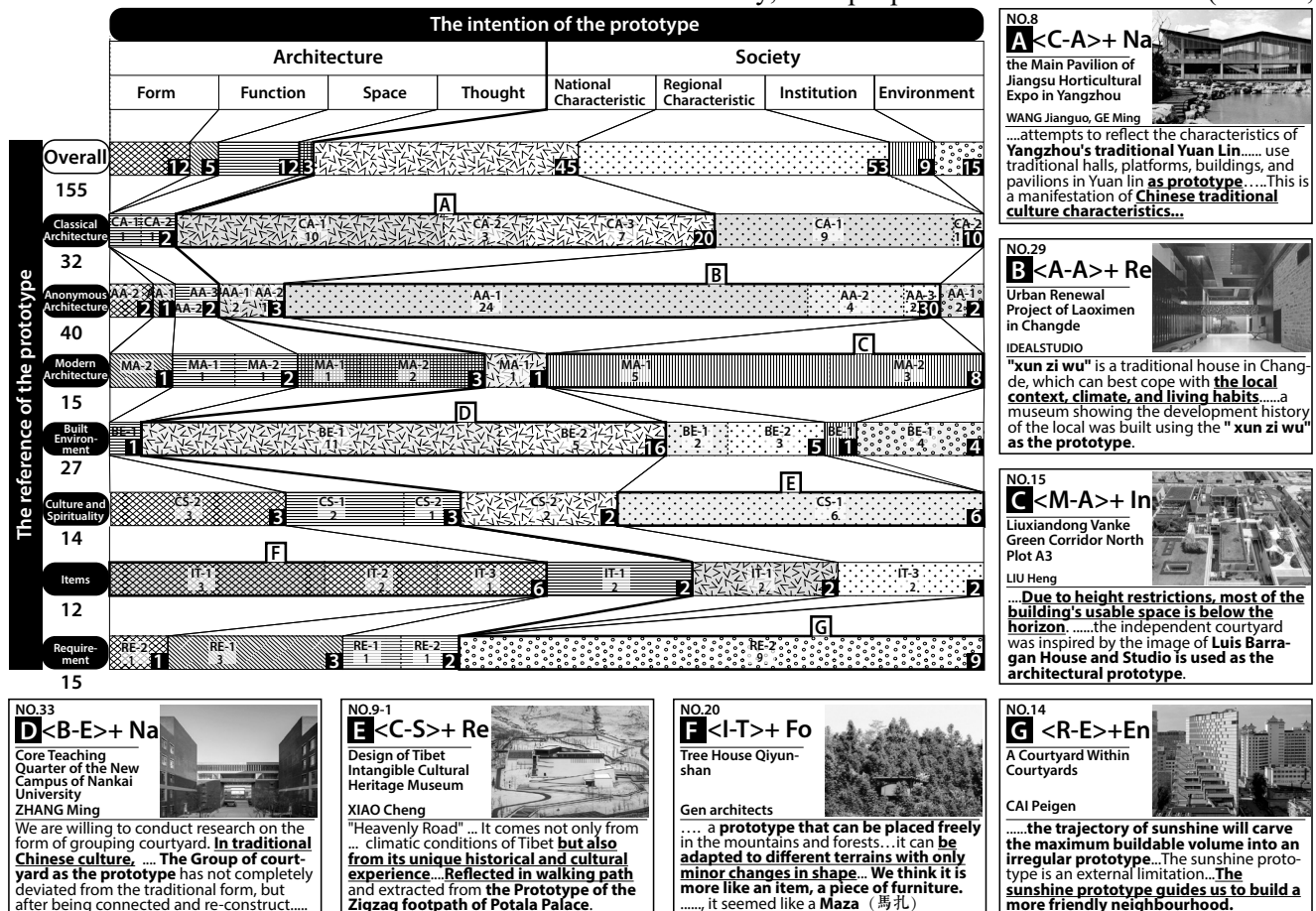


Fig.5 The relationship between Intention and Reference

<A-A>, <M-A>) gradually increased. <A-A> as Reference of prototypes appear from the 1990s. <M-A> occur since 2000, and its ratio has risen sharply after 2010. This means architecture as a Reference of prototypes is still mainstream in China. Secondly, <C-A>, <B-E>, and <R-E> have always been used as prototypes. Among them, The percentage of <C-A> decreased from 2010. <B-E> is roughly the same after 1999, showing some stability. <R-E> increased from 2000. Tertiary, Chinese architects have gradually begun to use [non-historical] as a reference for prototypes in large numbers in the last two decades. It has been reflected in <M-A>, <I-T>, and <R-E>. This reflects the pluralistic thinking of Chinese architects about the meaning of prototypes. In summary, Chinese architects' thinking about the meaning of prototype is also reflected in the change of Reference. This is reflected in two part. On the one hand, Reference have become diverse. For example, <A-A>, <M-A>, <C-S> and <I-T> have emerged. On the other hand, the ratio of each Reference is constantly changing. For example, ratio of <C-A> shift to <M-A> and <A-A>.

4.4 Chronological Change of Seven Type

According to the contents of Fig.5, chronological changes of seven typical combinations are drawn in Fig.7.

Types A, B, and C are using architecture(<C-A>, <A-A>, <M-A>)as the reference of prototypes, and their proportions are decreasing since 2010. However, the proportion of architecture as reference is increasing in terms of the chronological change of reference (Fig.7). This illustrates, on the one hand, the intention of the Chinese architect was a dramatic shifted from society to architecture in the last decade (Fig. 6) and, on the other hand, they explore non-architecture as a Reference. Type A and D appeared in the 70s and were the first two types used as prototypes. Type A decreased sharply since 2000, while the ratio of D

remained stable. This means Type D still represents the direction of thinking about the prototype. Type C and G appeared after 2000. It reflects the demands of the new zeitgeist about the influence of pragmatism on architecture. Type B, E and F emerged in the 1990s. Because of the emergence of C and G, their ratios decreased in 2000 but increased after 2010. These new types of fluctuations prove that Chinese architects are constantly exploring and revising their thinking during this period. In general, A, B and D are the mainstream prototypes. The appearance of B, E, and F implies a change of attitude because a group of young architects who studied in the 1980s began to become the backbone of the architecture field after 2000. Meantime, Chinese architects began to enter a period of exploration of prototype pluralism by breaking away from a fixed collocation about the Intentions and Reference of the prototype.

5. Conclusion

In this study, the content of the prototype is divided into 8 intentions of the prototype and 7 references of the prototype. By analyzing the architects' intentions, Chinese architects are more concerned with a social aspect. And by analyzing another part, they use different References to explore the meaning of prototypes. It is reflected not only in the variety of references but also in its focus points. Through combination and chronological trends analysis of these two sections, prototypes as an architectural term have taken on a very diverse meaning in China under a dual function of economic growth and the hosting of several national events. This is reflected not only in the richness and transformation of the Intentions and Reference of prototypes, but also in its various combination.

- Notes:
 1) China's reform and Opening-up policy refer to the program of economic reforms termed "Socialism with Chinese characteristics" and "socialist market economy" in the People's Republic of China (PRC).
 2) "原型 -Prototype" in Xinhua Dictionary means the original type or model of a thing.
 3) Both "Archetype" and "Prototype" are translated as "原型" in China.
 4) 155 texts related to "原型" from 1978 till 2020 are selected as research material.

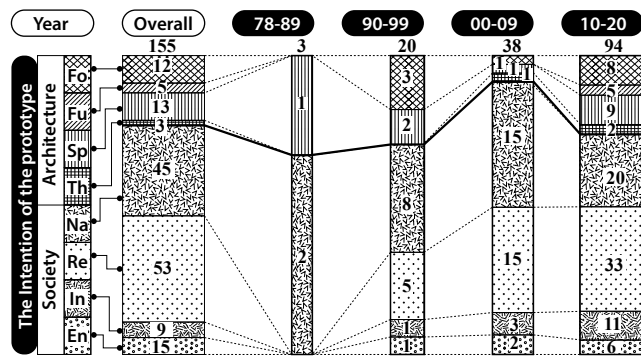


Fig.6 Chronological change of Intention

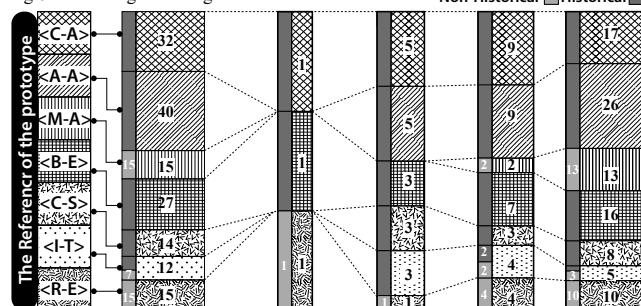


Fig.7 Chronological change of Reference

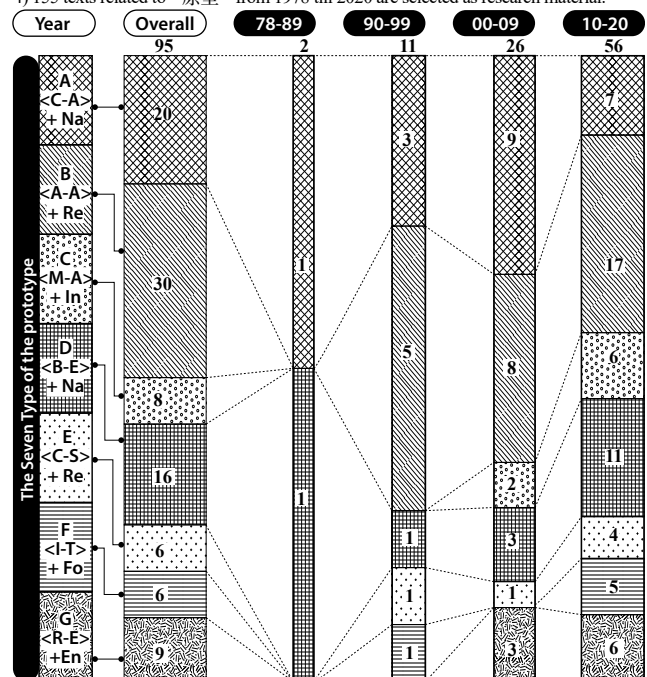


Fig.8 Chronological change of Seven Type