

# Chapter 2

## Measurement and Application of Urban Memory Related to Historic Areas in Beijing

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### 2.1 Introduction

China is approaching rapid urbanization, and simultaneously, globalization is dramatically changing the unique history and traditional style in traditional Chinese cities. The diminishment and reconstruction of historic sites in China comprise a common problem, leading to the “amnesia” phenomenon over the disappearance of unique characteristics and decay of the urban cultural context. China is currently in an active stage of global social and economic transformation. As its capital, Beijing not only suffers from problems of demolition, renovation, and regeneration brought by rapid urbanization but also faces the impact of globalization, which proves to be a huge threat to the city, whose history spans more than 3000 years. Amid tough situations during the process of rapid change, Beijing’s development has brought to the fore the core issues of saving the context of urban development, protecting cultural heritage and urban characters, and dealing with new challenges of cultural preservation. All of these account for the necessity and urgency in the study of urban memory in Beijing.

Urban memory is the collective impression of the formation, change, and development of a city. In the case of Beijing, the preservation and continuation of urban memory are innovative means for protecting the ancient capital and carrying out urban regeneration. The study of the measurement and application of urban memory, based on historic areas in Beijing, aims to determine means to perpetuate

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and preserve urban memory as well as provide unique development approaches in ancient cities, such as Beijing, especially in the context of rapid urbanization.

In its literature review, this research establishes a system of measurement based on theories on historical areas and urban memory, with historical sites in Beijing as examples. The article reaches the conclusion of “what to protect” and “how to protect,” thereby offering comprehensive methods and theoretical guidance for the protection of historical areas and preservation of urban memory.

## 2.2 Literature Review

### 2.2.1 *Memory, Place, and Urban Memory*

Memory itself has a long evolution: as long as human consciousness. Memory is the mental capacity through which events are stored, preserved, and recalled in mind; it is in permanent evolution, open to the dialectic of remembering and forgetting (Nora 1989). The individual is the subject of memories, and individual memory processes are derived from social interaction. Maurice Halbwachs, the French sociologist, set the foundation for the research on the relationship between memory and society. In his 1925 landmark publication “Social Frameworks of Memory,” Halbwachs emphasizes the influence of society on individual memory (Halbwachs [1925] 1992). He was the first to propose the idea that there is memory at the collective level and used the term “collective memory” to express the social contextualization of all individual memories. In a series of studies, Halbwachs argues that every memory is carried by a specific social group limited in space and time (Confino 1997). French historian Pierre Nora, the “true heir to Halbwachs” has documented all the “places of memory” in French society and noted the passing of memory into history as akin to losing a living relation to the past. Nora’s multivolume project “Les Lieux de Mémoire” (Nora 1989) underpins further spatial takes on memory for its emphasis upon the realms and physical sites or places of modern, collective memory (Legg 2005). Along with the classic studies of Halbwachs and Nora, Olick and Robbins (1998) offer a similar argument and refer to distinct sets of mnemonic practices in various social sites, rather than to collective memory as a phenomenon. Bélanger (2002) understands collective memory as a social process, one that surpasses the understanding of memory simply as the accumulated recollections of actual historical events. Huyssen (1995: 7) mentions that humans search for and build places of memory that can provide a sense of “temporal anchoring” in a world of up-to-the-minute media saturation and information overload.

Meanwhile, thematic studies have paid attention to the relationship between collective memory and urban space. Memories are built as a city is built (Hebbert 2005), and cities serve as powerful symbols and repositories of memory (Ladd 2008). Halbwachs ([1925] 1992) set the roots for identifying the role that space plays in shaping collective memory; every collective memory unfolds within a spatial framework. Urban spaces as lived spaces shape collective imaginaries (Huyssen

2003), and the collective memory of a city participates in the actual transformation of space in the works of the collective (Rossi 1982). Le Goff (1992) identifies five distinct periods in the history of memory; he notes that city structures emerged in the second stage, following the emergence of mnemonic practices. As Casey (2004: 38) bluntly asserts, “public memory needs a place of enactment, a scene of instantiation”; public places as a component of public memory are designed to be long-lasting structures that assure continued remembrance. Hebbert (2005) focuses on streets and explains how a public space can be a locus of collective memory. Many studies on collective memory and urban space focus primarily on monumental landscapes, as monuments, memorials, and museums have proven to be fertile grounds for investigating places of memory (Till 2003; Jordan 2006; Henneberg and Clara 2004; Forest and Johnson 2002; Johnson 2002; Withers 1996). Stangl (2008) takes an alternative focus by considering the relationship between vernacular architecture and cultural memory. He argues that the vernacular and monumental are intertwined in urban space, sharing an ambiguous and fluid borderline. The distinction is significant in the analysis of how “some vernacular places become memorialized and some monumental places become vernacularized” (Stangl 2008: 251).

Recent research in different disciplines explores the political, cultural, spiritual, and socio-economic dynamics of what Crinson (2005) calls “urban memory.” This term can be regarded as an expression of collective memory shaped within a particular space and time; thus, it expresses relations between the past and the present of a particular place (Ringas et al. 2011). As Srinivas (2001: xxv) suggests, urban memory provides a “means of accessing how various strata of society and different communities construct the metropolitan world”. For Crinson and Tyrer, “modernism in architecture often seem[s] to erase memory from the city” (Crinson 2005: i); they chastise planners and developers for using memory “to aestheticize and co-opt the past into new forms of place-making” (Crinson 2005: 50). Maden and Temsiliyet (2009) follow Crinson’s theory and propose that urban memory should be considered when making a planned design. Jorden (2006) focuses on the role of memory in Berlin’s urban reconstruction and factors that influence forgetting and remembrance. Ekici (2007) views the complex relations between the urban manifestations of collective memory and contemporary architecture in Berlin. Jenks’ article on Little Tokyo in Los Angeles addresses the issues of ethnic identity, urban space, and politics of collective memory (Rose-Redwood et al. 2008). Matten (2011) addresses the issues of national and cultural identity of China by applying Pierre Nora’s approach “places of memory” (*lieux de mémoire*) to the Chinese context, and focuses on the most significant places of memory in modern and contemporary China. Blunt and Bonnerjee (2013) follows Srinivas’ argument that different groups in a city create different landscapes of memory, highlighting the ways through which members of two minority communities living in London and Toronto remember Calcutta as home. Ringas and Christopoulou (2013) apply urban computing the three constituents of urban memory, namely, place, community, and infrastructure, in Corfu and Oulu, and present a survey of applications aimed to capture, preserve, and exploit urban memory as well as maintain and strengthen urban memory.

### 2.2.2 *Elements of Urban Memory*

The elements of urban memory differ according to different scholars. Rossi (1982) bases his view on the physical form of cities, looking for urban memory not in buildings but in the voids between them: Architecture, streets, squares, and monuments (large-scale architecture) are the important content embodying urban memory. Halbwachs ([1925] 1992) has called attention to the double nature of collective memory: first, the physical, pertaining to items in the material reality, such as statues, monuments, and places in space; and second, the symbolic, or objects of spiritual significance, including intangible resources shared by a group that adheres to and is superimposed upon the physical reality. Similar to Halbwachs, Nora's (1989) conception of *lieux de mémoire* (places of memory) highlights both material sites of memory, including burial places, cathedrals, battlefields, and prisons, as well as non-material sites of celebrations, spectacles, and rituals. Zhu (2005) adds the elements of subjective experience and time to urban memory, divided into corporal (participations in action), field and scenery (ambient and mental sensation of object characters), and symbolic elements (homonym, type, and landmark that emphasize the cultural experience of subjects). Alba (2012) takes Mexico City as a case study, using Halbwachs's notion of collective memory as theoretical framework, and summarizes the factors of urban memory: time [personal (life stages) and historical (city's past)], space (city, neighborhoods, areas or specific places), and groups (family and community context; education and job trajectory).

Other multi-disciplinary studies have explored the varied influence of urban memory. Kansteiner (2002) mentions three factors of collective memory: the intellectual and cultural traditions, memory makers, and memory consumers; his work gives a temporal dimension to collective memory. Bélanger (2002) and Mowla (2004) propose the idea that products of urban memory usually favor a small minority of elites; in other words, privileged groups are typically in a better position than others to propose their memory as the predominant urban memory. Postalcy et al. (2006) has considered the experiences of both inhabitants and observers as regards their effects on urban memory; he concludes that major changes in the physical or social environment can cause discontinuities and urban memory loss. After examining 200 sites in the greater Berlin area, Jordan (2006) reports that land use, land ownership, memorial entrepreneurs, and the broader public resonance are deterministic factors in the emergence of a memorable place. Lahiri (2011) adopts a multi-sensory approach to study trans-local urban memories, finding that the sensory factors influencing urban memory encompass visual, smell, sound, and taste. Based on traditional symbols suggested by Mowla (2004), Othman (2013) proposes that the influencing factors of memory toward place making can be divided into three components: individual or group, physical (demographic, socioeconomic status, location, and scale [spatial attributes]), and social factors (geographical perspectives, place experiences).

Based on the literature review, urban memory can be divided into three elements: subjective, objective, and time elements. Among them, the subjective

elements serves as the producer of urban memory; the objective ones are the remembered memories of urban memory; and the time elements include the influential elements of urban memory.

### ***2.2.3 Historic Areas in Beijing***

Beijing is a city with a history of more than 3000 years. It has been China's capital for 850 years. The city features a well-preserved architecture system and square road network, and it was regarded as a "brilliant work of urban planning in ancient China" (Liang 1986: 51). American urban planner (Bacon 1974: 232) has described Beijing as "possibly the greatest single work of man on the face of the earth." Since its establishment under the Yuan Dynasty, the city has accumulated a wealth of cultural and historical resources.

Since the establishment of the People's Republic of China, research on historic areas in Beijing has undergone dramatic progress in theoretical innovation and practical attempt. In the 1950s, renowned architects Sicheng Liang and Zhanxiang Chen carried out a scientific planning of Beijing, claiming that "Beijing City is an entity with planning as a whole" (Liang 1986: 62), and proposed the protection of the old city. After Liang, his student Liangyong Wu continued to develop and improve the theory and practice of protecting historic areas in Beijing. Based on different theories of urban development and historic protection, combined with the situation in Beijing, Wu proposed the primary theory of "organic regeneration" in the planning and research of the Shichahai District, a historical and cultural scenic area in Beijing, which is also a conservation district of historic sites, in 1979. The theory was implemented in the successful renovation of old residences at Ju'er Hutong in 1987. Since then, many Chinese scholars have entered the field and produced varied results (Zhang 1996; Wang 1998; Fang 2000; Liu 2006). This issue has also attracted international scholars. Abramson (1998) studies the conflict between protection and development in old Beijing City from the perspective of cultural research, stressing the importance of cultural awareness. Broudehoux (2004) and Zhang (2008) analyze Beijing's urban conservation policies and suggest that such policies should be closely related to the promotion of urban growth. Abramson (2007) considers the practice of "protecting" designated historic structures by clearing the space around them. Further, he claims that the dependence on a totalizing bird's-eye view to define Beijing's overall characteristic form produces a city-wide preservation policy that is particularly ill equipped to accommodate change. Whitehand and Gu (2007) apply a type of morphological approach developed by M.R.G. Conzen to the protection of a historical area in Beijing; this endeavor emphasizes the historic-geographical environments in which historical sites, structures, and spaces exist. Heath and Tang (2010), Abramson (2001), Goldman (2003), and Stone (2008) study the development process of protection policies in Beijing, proposing appropriate strategies for protecting and regenerating Beijing's hutongs and old residences in the context of globalization.

## **2.3 Research Design and Data Collection**

### ***2.3.1 Study Sample***

The historic areas in Beijing are the most important carriers of the city's memory, the protection of which has developed from single architectural pieces to architectural clusters, from the old city to the entire city domain. The current protection policies emphasize a comprehensive vision concerning the connection of the core and outskirts of the old city. The present research will expand the scope to the entire domain of Beijing, study its historic areas as a whole, and then reflect its collectiveness as carriers of urban memory. The selection of specific historical locations is determined via initial collection, secondary screening, and case sampling. After the screening, 367 historical locations are chosen, and their basic properties, including spatial characteristics (geographic location), temporal characteristics (age), degree of heritage protection, scale and scope, and functional features, are quantified to form a basic information database. Based on this, the research uses stratified proportional sampling combined with moderate Delphi method to select sampling cases from the database. The selection of samples covers all types of spatial, temporal, and functional characters seen in the selected historical cases. The selection also considers the reflection of experts. Finally, 19 historic sites within the domain of Beijing City are confirmed as study areas (Table 2.1). The following research will take these 19 areas as examples to study the urban memory of historic areas in Beijing.

### ***2.3.2 Establishment of Measurement Scale***

Based on the literature review of urban memory, combined with studies on historic areas in Beijing, analysis of Internet resources, and on-site interviews, the research proposes a set of scales of universal significance to measure urban memory. In this sense, urban memory comprises four level-one variables (subjective elements, mainly about the memorizer; objective elements, mainly about the memory carrier; time elements; and impact elements). Further, 10 level-two and 45 level-three variables are considered (Table 2.2).

### ***2.3.3 Design of the Questionnaire and Investigation***

According to the previous proposed measurement scale for urban memory, the questionnaire in this study contains the following: investigation and survey of the historic areas (16 factors); evaluation survey of historic areas (16 factors); time and memory investigations (5 factors), and personal information.

Table 2.1 Sampling of selected historic areas (Source ©Authors)

Time	Core area	Function	Expansion area	Function	Outer suburbs	Function
Yuan (1206–1368) Dynasty and Earlier Ming (1368–1644) and Qing (1644–1912) Dynasties	Nan Luoguxiang	Common residence	The summer palace Babaoshan revolutionary cemetery	Royal palace Cultural-memorial site	The ming tombs	Royal tombs
	The palace museum	Royal palace			Cuandixia ancient buildings	Ancient towns and villages
	Bell and drum towers	Royal services				
	Shichahai	Common residence				
	Temple of heaven	Royal ritual site				
	Tian'an men	Cultural landmark				
	Dashilar commercials	Daily services				
	Mansion of the prince of Gong	Officials and nobles' mansions				
	City Wall in Ming Dynasty	Cultural heritage				
The Republic of China (1912–1949)	Former site of DuanQirui government	Administration and governance	Weiming Lake and Yan Yuan architectures	Education and research	Tanzhe temple	Cultural-religious site
	Chen Duxiu's former residence	Former residence of celebrities				
	Cultural palace of the nationalities	Daily services				
Modern			Modern architectures in 798 art zone	Industry and manufacturing		

**Table 2.2** Measurement scale for urban memory based on historic areas in Beijing (*Source* ©Authors)

Level-one variables	Level-two variables	Level-three variables	Five-level evaluation/ Investigation survey				
Subjective	Retaining elements	Overall evaluation	1	2	3	4	5
		Protection value	1	2	3	4	5
		Urban-style promotion	1	2	3	4	5
		Hindrance to modernization	1	2	3	4	5
		Positive effects of demolition	1	2	3	4	5
	Characteristic elements	Urban culture inheritance	1	2	3	4	5
		Important part of Beijing	1	2	3	4	5
		Important city characters	1	2	3	4	5
		Deepen understanding of the city	1	2	3	4	5
		Better understanding of traditional culture	1	2	3	4	5
		Need for renewal	1	2	3	4	5
	Renewal elements	Overall impression after renewal	1	2	3	4	5
		Embodiment of original appearance after renewal	1	2	3	4	5
		Bearing original culture after renewal	1	2	3	4	5
		Continuation of original function after renewal	1	2	3	4	5
		Urban-style promotion after renewal	1	2	3	4	5
		Positive effects of urban development after renewal	1	2	3	4	5
Objective	Static elements	Location	1	2	3	4	5
		Surroundings	1	2	3	4	5
		Building form	1	2	3	4	5
		Traditional spatial pattern	1	2	3	4	5
		Representative buildings	1	2	3	4	5
		Cultural relic	1	2	3	4	5
		Protection level	1	2	3	4	5
	Evolution elements	Change of name	1	2	3	4	5
		Change of usage	1	2	3	4	5
		Renewal planning	1	2	3	4	5
		Change of style	1	2	3	4	5
	Temporal elements	Historical celebrities and events	1	2	3	4	5
		Backgrounds and anecdotes	1	2	3	4	5
		Historical function	1	2	3	4	5
		Former name	1	2	3	4	5
		Origin of name	1	2	3	4	5

(continued)

**Table 2.2** (continued)

Level-one variables	Level-two variables	Level-three variables	Five-level evaluation/ Investigation survey
Time	Point of time	Festival activities	Investigation/Interview
		Renewal planning implementation	Investigation/Interview
		Significant events	Investigation/Interview
	Time section	Remarkable period	Investigation/Interview
		Declining period	Investigation/Interview
	Time axis	Building age	Investigation/Interview
		Dynasties survived	Investigation/Interview
Impact elements	Subjective properties	Residential time	Investigation/Interview
		Access to information	Investigation/Interview
		Degree of familiarity	Investigation/Interview
		Educational background	Investigation/Interview
		Per capita income	Investigation/Interview

The formal questionnaire survey was conducted from April 21 to May 9, 2011, including field research and Internet survey. A total of 419 questionnaires (including 103 online questionnaires) were handed out; 382 of the collected ones were valid, accounting for a 91.1 % validity ratio. By utilizing both field and online research, the survey reached a relative balance in the properties of memorizers studied. Field survey respondents were mainly the elderly in residential areas, with relatively low education and categorized under the long-term memory group; meanwhile, the online survey respondents were those able to use a computer, relatively of a younger age and with higher education, including a certain number of students. The two programs complemented each other in ensuring the diversity and balance of respondents’ backgrounds in age, education, income, living experience, access to information, and other aspects.

After the questionnaires were recovered, a statistics process of the data was carried out using Excel 2007 and SPSS 16.0 for Windows. The data processing methods include descriptive statistics, modeling calculations, and correlation analysis (Pearson).

**2.4 Measurement Methods for Urban Memory**

This section mainly measures the urban memory of historic areas in Beijing from three dimensions: subjective, objective, and time elements.

### 2.4.1 Measurement of the Subjective Elements of Urban Memory

Using a Likert scale with five grades as measurement system, the research introduces subjective evaluation values (EVs) to measure the degree of subjective memory. The memory degrees for each individual surveyed can be obtained according to Formula 2.1 Integrated EVs on the issue can be reached by adding up all the EVs on the indicator from all memorizers (the total number in N). The EV value ranges from 0 to 1: a bigger value indicates a higher evaluation level. For convenience in analysis, the EV is primarily classified as follows:  $0 \leq EV < 0.4$  is low,  $0.4 \leq EV < 0.7$  is medium, and  $0.7 \leq EV \leq 1$  is high (but these are not as stringent standards).

$$EV = \sum_{i=1}^n \frac{a_i - 1}{4n} \quad (2.1)$$

Formula 2.1: Subjective EV

In the formula,  $n$  is the number of samples of the research and  $a$  is the points given by the individuals in the sample (using 0–5 points).

### 2.4.2 Measurement of the Objective Elements of Urban Memory

Using a Likert scale with five grades as measurement system, the research introduces urban memory cognitive (UMC) to measure the degree of objective memory of the city. Memory degrees for each individual surveyed are obtained according to Formula 2.2. An integrated UMC on this issue is determined by adding up all the UMCs on the indicator from all memorizers (the total number in N). For convenience in analysis, the UMC is primarily classified as follows:  $0 \leq UMC < 0.4$  is low,  $0.4 \leq UMC < 0.7$  is medium, and  $0.7 \leq UMC \leq 1$  is high (not stringent standards).

$$UMC = \sum_{i=1}^n \frac{b_i - 1}{4N} \quad (2.2)$$

Single-Choice:  $b_i = a_i$

$$\text{Multiple-Choice: } b_i = \sum_{i=1}^k \frac{2a_i}{iK} + 3 \quad UMC = 0 \text{ (Null)}$$

Formula 2.2: Objective UMC

In the above formula,  $n$  is the number of sampling,  $n = 1, 2, 3, \dots, N$ ;  $a$  is the points given by the individuals in the sample (using 0–5 points); and  $K$  is the number of multiple-choice items.

### 2.4.3 Measurement of the Time Elements of Urban Memory

Similar to the measurement of objective elements in urban memory, the UMC indicator is used to measure the time elements, as shown in Formula 2.3.

$$UMC = \sum_{i=1}^n \frac{a_i - 1}{4n} \quad (2.3)$$

Formula 2.3: Time elements in UMC

In Formula 2.3,  $n$  is the number of samples, and  $a$  is the points given by the sample.

## 2.5 Applications of the Measurement of Urban Memory

This study is mainly focused on the empirical measurement of urban memory levels in Beijing historic sites. Using SPSS to analyze the urban memory level of 19 historic areas, this research identifies five main factors related to the urban memory of the historic areas under review. According to these main factors, a cluster analysis of the 19 historic areas is conducted, thereby classifying the historic areas in Beijing into five categories. This chapter summarizes the memory type of different historic areas, as well as the influencing factors of each type, as a reference to the protection measure of different types of historic areas.

### 2.5.1 Abstraction of Main Factors in Urban Memory

Urban memory data of the 19 historic areas (including UMC and EV) from the questionnaire and data processing are imported to SPSS 19.0. Using principal component analysis, a factor analysis is carried out for the urban memory level from 38 different elements of the 19 historic sites. The first round of KMO values is greater than 0.5, which indicates data fitness with factor analysis. Using principal component analysis, and by rotating the rotary component matrix for better results, the 38 different factors are reduced to five main factors. These five factors can succinctly explain 81.744 % of the historical memory of the city.

The above analysis gives the five principal factors as regards the urban memory level of historical sites in Beijing. According to the descriptive elements of urban memory in each of the factors, they are explained as follows.

#### Main Factor 1: Objective Dynamic Memory factor

This factor mainly includes urban memory elements related to object information in historic areas. Apart from static elements, such as location, vicinity, and

architecture style, the factor also includes dynamic information on the development and change of the historic areas, such as functional evolution, style changes, previously used name, and name replacement; therefore, factors of this type are used to describe residents' memory of the objective information of historic areas, which emphasize the memory formed in the process of development and changes. Thus, this factor is called Objective Dynamic Memory.

#### **Main Factor 2: Integrated Characteristic Memory factor**

This factor is from the comprehensive point of view as a descriptive factor of the urban memory of residents, mainly on their awareness in such aspects as the protection value of a historical area as a whole, cultural elements, important features, and importance as a cultural heritage of Beijing. This awareness is based on the cultural features and completeness of historic areas in Beijing. Thus, the term Integrated Characteristic Memory factor is used.

#### **Main Factor 3: Continuous Time Memory factor**

This factor includes elements on information on the urban memory level described in three dimensions: time axis, time period, and point of time. Specifically, these factors relate to the major events, prosperity, and decay of historical areas, as well as age of the area and dynasties survived. The survey not only investigates the formation of urban memory on a certain time point but also emphasizes the continuous memory formed throughout the development history of a historic area. Thus, the term Continuous Time Memory factor is used.

#### **Main Factor 4: Lasting Retained Memory factor**

This factor mainly focuses on citizens' attitude toward a historic area based on their perception regarding an area's positive effect on Beijing's development, including whether certain areas should be demolished.

#### **Main Factor 5: Protection Renewal Memory factor**

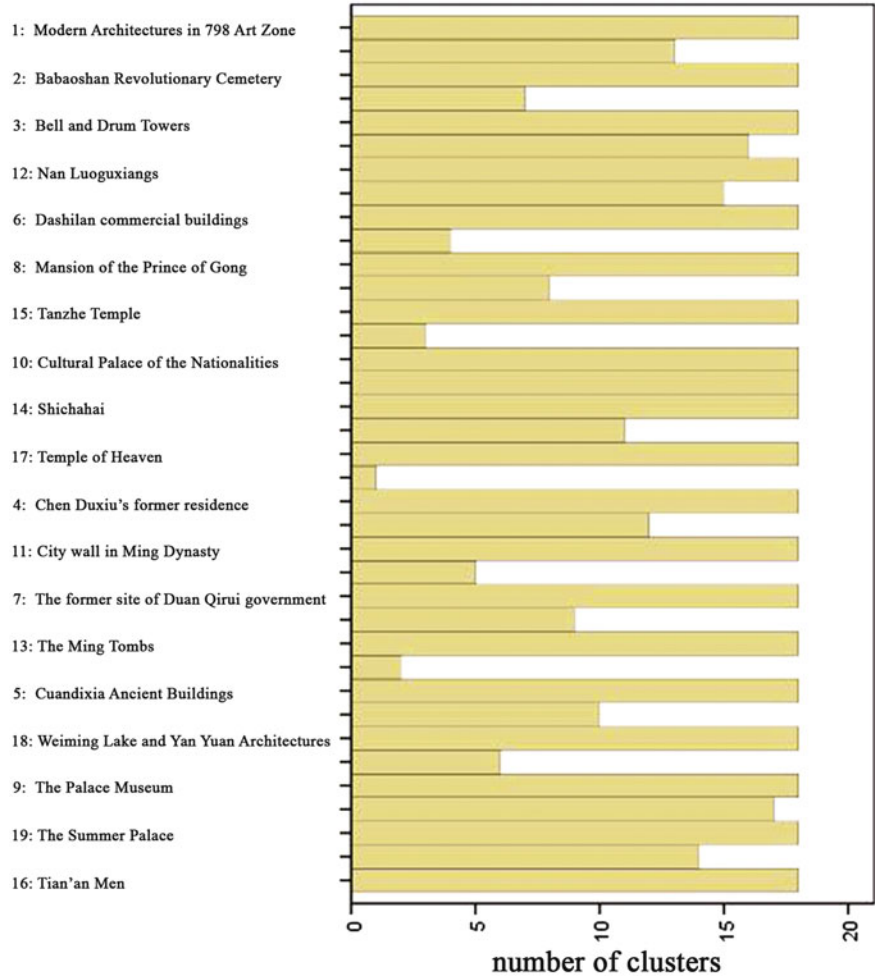
From the perspective of sustainable development of historic areas in future Beijing, this factor mainly includes the evaluation factor after the regeneration of a historic area, such as whether it reflects the original style, embraces the cultural context, continues the original function of the area, and offers a positive effect on the development of the area.

### ***2.5.2 Classification of Historic Areas in Beijing Based on Urban Memory Measurement***

According to the results of the principal factor analysis, the research uses Objective Dynamic Memory, Integrated Characteristic Memory, Continuous Time Memory, Lasting Retained Memory, and Protection Renewal Memory factors as the five

main factors to describe the urban memory level in historic areas in Beijing. Subsequently, further study is conducted on the classification of urban memory features carried by historic areas. The method of classification is based on SPSS 19.0 classification software, taking the scores in five main factors of 19 historical areas as the fundamental matrix, with hierarchical clustering method, group average method, and cosine and Z-score transformation standardized method. The 19 historic areas are classified into five categories according to the vertical icicle diagram (Fig. 2.1) and cluster dendrogram (Fig. 2.2) drawn from the results of the analysis.

The average points of each historic area category is obtained based on the factor analysis scores for the five main factors of each historic area, as shown in Table 2.3.



**Fig. 2.1** Factors in a cluster vertical icicle diagram (Source ©Authors)

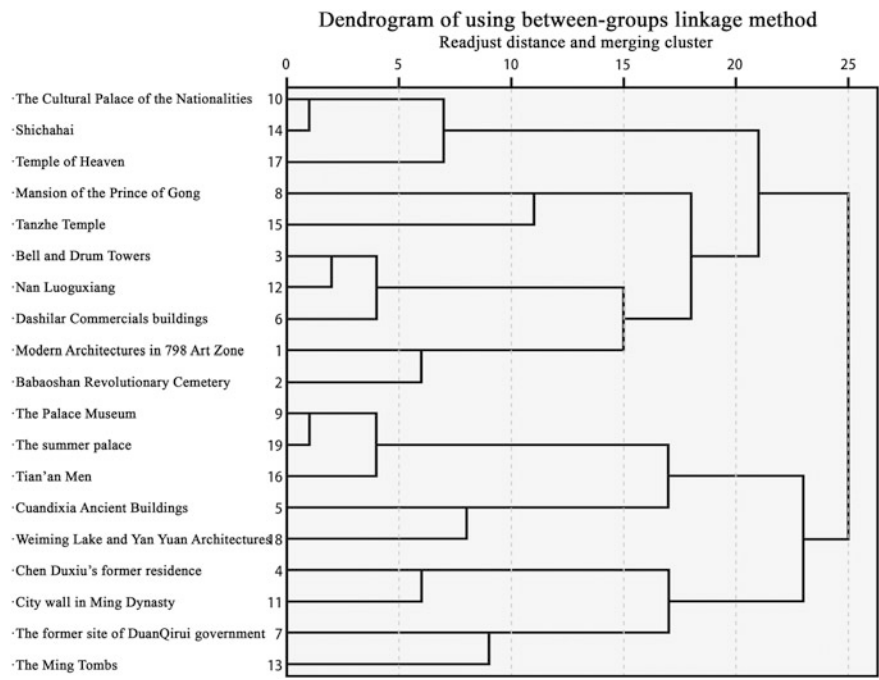


Fig. 2.2 Factors in a cluster analysis dendrogram (Source ©Authors)

After the scores of historic sites from five categories are obtained, the dataset needs to be standardized to determine the factor characteristics (as shown in Table 2.4). The values in the standardized factor scores average sheet are designated as high, medium, and low as follows:  $1.5398 \geq X * ij > 0.8$  is high,  $0.8000 \geq X * ij > -0.8000$  is medium, and  $-0.8 \geq X * ij \geq -1.5807$  is low. This scale helps simplify the expression of the various factors on the features of diffident historic areas.

### 2.5.3 Summary of the Classification of Historic Areas in Beijing

Based on the factor-cluster analysis of historic areas in Beijing, the rules on the urban memory level in the five categories of historic areas can be concluded. Using Pearson’s correlation analysis, the research analyzes the influence elements on these historic areas to provide bases for the protection and renewal of historic areas.

**Table 2.3** Scores for the five main factors of historic areas in Beijing (Source ©Authors)

Categories	Historic areas	Objective dynamic	Integrated characteristic	Continuous time	Lasting retained	Protection renewal
I Objective dynamic memory factor	Cultural palace of the nationalities	0.65652	-0.69978	-1.07525	0.20385	-2.66136
	Shichahai	0.45636	-0.35992	-0.39522	0.18373	-0.68899
	Temple of heaven	0.90955	-0.00384	-0.95404	-0.98573	-0.72881
	Average	0.6741	-0.3545	-0.8082	-0.1994	-1.3597
	Mansion of the prince of Gong	0.26732	0.27128	-0.36513	-0.03416	0.07211
II Integrated characteristic memory factor	Tanzhe temple	-1.83616	2.10908	-1.9016	-0.05788	0.97729
	Average	-0.7844	1.1902	-1.1334	-0.0460	0.5247
	Modern architectures in 798 art zone	-0.41248	-1.61375	-0.57075	1.45087	0.83233
III Continuous time memory factor	Babaoshan revolutionary cemetery	0.02311	-0.84654	-1.26121	0.55782	-0.12869
	Bell and drum towers	0.18322	0.72553	-0.30763	1.04112	0.33276
	Dashilar commercials	1.05236	0.07331	-0.21331	1.27409	0.53903
	Nan Luoguxiang	0.17068	0.29341	0.12993	1.33914	0.57454
	Average	0.2034	-0.2736	-0.4446	1.1326	0.4300
	Cuandixia ancient buildings	-0.23667	-1.99886	-0.49957	-2.51267	1.63142
	The palace museum	0.79614	0.98499	0.9979	-0.20573	0.60173
IV Lasting retained memory factor	Tian'an men	0.01252	0.81538	0.87111	-0.26428	0.62984
	Weiming lake and Yan Yuan architectures	1.03552	-0.28259	0.24952	-0.68273	0.79813
	The summer palace	1.28949	0.5028	1.05316	-0.09888	0.33464
	Average	0.5794	0.0043	0.5344	-0.7529	0.7992
	Chen Duxiu's former residence	-2.28931	-0.55756	0.92498	0.07517	-0.21109
V Protection renewal memory factor	The former site of the DuanQirui government	-1.46605	0.46844	0.15302	-0.7967	-1.45855
	City wall in ming dynasty	-0.91721	-1.04065	2.25073	0.84532	-0.47503
	The ming tombs	0.30508	1.15924	0.91337	-1.33239	-0.9713
	Average	-1.0919	0.0074	1.0605	-0.3022	-0.7790

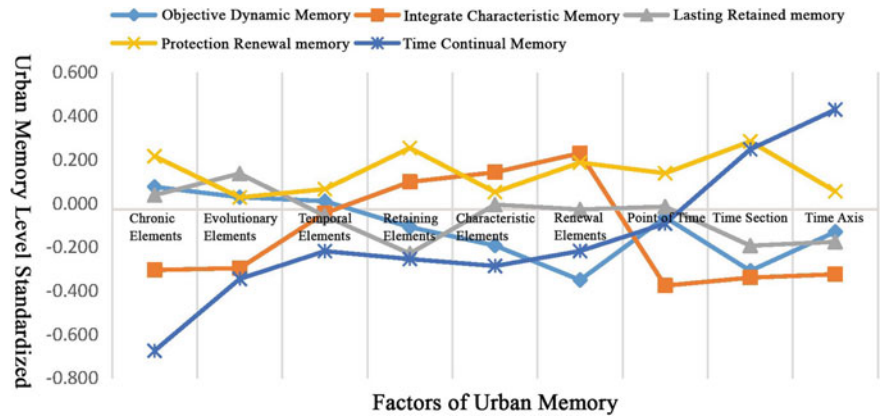
**Table 2.4** Highest and lowest scores for the five main factors of historic areas in Beijing (standardized) (Source ©Authors)

Categories	Objective dynamic 1	Integrated characteristic 2	Continuous time 3	Lasting retained 4	Protection renewal 5
I	<u>1.216184</u> (high)	0.187527 (medium)	-0.26613 (medium)	0.342657 (medium)	<u>-0.81768</u> (low)
II	-0.77638 (medium)	<u>1.310429</u> (high)	<u>-1.14516</u> (low)	0.003979 (medium)	0.607131 (medium)
III	-0.00989 (medium)	-0.77318 (medium)	<u>-1.0468</u> (low)	<u>1.477113</u> (high)	0.352756 (medium)
IV	0.555644 (medium)	-0.36649 (medium)	0.483523 (medium)	<u>-1.58071</u> (low)	<u>0.908029</u> (high)
V	<u>-1.04633</u> (low)	0.274414 (medium)	<u>1.53979</u> (high)	-0.09747 (medium)	-0.6704 (medium)

2.5.3.1 Summaries on the Rules on the Urban Memory Level in the Five Categories of Historic Areas

The rules on the urban memory level in the five categories of historic areas are as follows: memory of Preserving Elements, Characteristic Elements, Renewal Elements, Static Elements, Evolutionary Elements, Temporal Elements, and memory upon Point of Time, Time Section, and Time Axis (Fig. 2.3). The specific rules for these memories are shown in Table 2.5 (using standardized data on urban memory level).

Through the above summary of urban memory levels in historic areas under five categories, the different characteristics in the urban memory of Beijing can be obtained. For each category, different strategies for future protection and specific aspects for continuing urban memory can be proposed according to the different elements of urban memory considered as high, low, or medium. The applicable rules for nine main elements are compared, which yields the following features:



**Fig. 2.3** Comparison of rules on the urban memory level of historic areas under five categories (Source ©Authors)

**Table 2.5** Rules on the urban memory in five categories of historic areas in nine main elements (*Source* ©Authors)

Categories	Static elements	Evolutionary elements	Temporal elements	Retaining elements	Characteristic elements	Renewal elements	Point of time	Time section	Time axis
Objective dynamic	0.077	0.030	0.011	-0.108	-0.192	-0.350	-0.062	-0.308	-0.130
Integrated characteristic	-0.304	-0.296	-0.043	0.100	0.143	0.231	-0.376	-0.339	-0.324
Lasting retained	0.039	0.137	-0.056	-0.229	-0.004	-0.027	-0.014	-0.192	-0.175
Protection renewal	0.217	0.029	0.066	0.255	0.053	0.188	0.139	0.285	0.057
Continuous time	-0.674	-0.344	-0.218	-0.254	-0.285	-0.217	-0.091	0.249	0.431

(1) **Overall rule**

From the perspective of the overall level of urban memory, the Protection Renewal Memory factor ranks the highest, with scores generally higher compared with other types of historical districts. The Objective Dynamic Memory and Lasting Retained Memory factors rank the lowest, garnering negative scores in certain items.

(2) **Balanced rule**

From the perspective of even distribution of urban memory scores among different elements, Protection Renewal Memory and Lasting Retained Memory factors are relatively balanced in distribution with little fluctuation. Meanwhile, the factors of Objective Dynamic Memory, Integrated Characteristic Memory, and Continuous Time Memory are not evenly distributed. For example, the Continuous Time Memory factor of historic areas ranks the highest (0.431) in the elements of Time Axis but lowest in Static, Evolutionary, and Temporal Elements ( $-0.674$ ,  $-0.344$ , and  $-0.218$ , respectively).

(3) **Rules for each element**

**Objective Elements:** A distinct difference is seen in the high and low points in the urban memory level of five categories of historic areas. The Continuous Time Memory and Integrate Characteristic Memory factors score low in the three sub-elements of Objective elements ( $[-0.674, -0.344, -0.218]$  and  $[-0.304, -0.296, -0.043]$ , respectively); the other three categories are higher on the Objective Element Memory level, mostly larger than 0. Objective Dynamic Memory factor scores are 0.077, 0.030, and 0.011, whereas Protection Renewal Memory factor scores are 0.217, 0.029, and 0.066.

**Subjective Elements:** Among the scores for all five categories of historic sites in three sub-elements of the Subjective Elements, Integrated Characteristic Memory (0.100, 0.143, 0.231) and Protection Renewal Memory factors (0.255, 0.053, 0.188) score the highest. Meanwhile, Continuous Time Memory factor scores the lowest ( $-0.254, -0.285, -0.217$ ).

**Time Elements:** Three sub-elements of the Time Element of urban memory show a significant level of difference. Continuous Time Memory ( $-0.091, 0.249, 0.431$ ) and Protection Renewal Memory factors (0.139, 0.285, 0.057) have the highest scores. The overall characteristics memory shows negative scores ( $-0.376, -0.339, -0.324$ ), and the other two also score low, with negative values between  $-0.014$  and  $-0.308$ .

### 2.5.3.2 Analysis of Influence Factors on Urban Memory in Five Categories of Historic Areas

The analysis of historic areas in five categories on memory related to Preserving, Characteristic, Renewal, Static, Evolutionary, and Temporal Elements, as well as

memory at a Point of Time, Time Section, and Time Axis, is combined with the residents’ attribute information. This process generates the relevant influential factors toward the major urban memory for different types of historic areas.

(1) **Type I, Historic Areas with Objective Dynamic Memory**

According to the cluster analysis results, the most salient features (including static, evolutionary, and temporal elements) of historic areas with Object Dynamic Memory are chosen for the analysis of the influential factors (as shown in Table 2.6). The main factors influencing Objective Dynamic Memory is the residents’ access to information related to a historical area, where the static elements and information access correlate at the 0.05 level of significance (bilateral), whereas evolutionary elements and information access are significantly related at the 0.01 level (bilateral). These findings indicate that information from life experiences supports the formation of Objective Dynamic Memory.

(2) **Type II, Historic Areas with Integrated Characteristic Memory**

For historic areas with Integrated Characteristic Memory, the most salient features (including the historical cultural elements, important characteristics, and understanding of Beijing’s culture) are chosen to analyze the influential factors (as shown in Table 2.7). The main factors influencing urban memory in these historic areas are the age structure of the population, which significantly correlates at the 0.05 level (bilateral) with a Pearson’s correlation coefficient of 0.276, in other words, the older the residents, the more profound their Integrated Characteristic Memory.

**Table 2.6** Analysis of influencing factors on urban memory of historic areas with objective dynamic memory

Objective dynamic memory		Age	Duration of residence in Beijing	Degree of familiarity	Access to information	Education background	Per capita income
Static elements	Pearson correlation	−0.059	0.145	0.032	<b>0.302</b> (*)	0.197	0.092
	Significance (bilateral)	0.677	0.304	0.824	0.030	0.161	0.515
	N	52	52	52	52	52	52
Evolutionary elements	Pearson correlation	−0.102	0.052	0.192	<b>0.367</b> (**)	−0.002	−0.013
	Significance (bilateral)	0.473	0.715	0.173	0.007	0.987	0.927
	N	52	52	52	52	52	52
Temporal elements	Pearson correlation	−0.155	−0.087	−0.014	0.226	0.119	0.050
	Significance (bilateral)	0.274	0.541	0.922	0.107	0.400	0.727
	N	52	52	52	52	52	52

\* significant of the correlation coefficient  
\*\* extremely significant of the correlation coefficient

**Table 2.7** Analysis of influencing factors in urban memory of historic areas with integrated characteristic memory (Source ©Authors)

Integrated characteristic memory	Age	Duration of residence in Beijing	Degree of familiarity	Access to information	Education background	Per capita income
Pearson correlation	0.276 (*)	0.166	0.177	0.049	−0.027	−0.172
Significance (bilateral)	0.047	0.241	0.208	0.732	0.849	0.223
N	52	52	52	52	52	52

\* significant of the correlation coefficient

(3) **Type III: Historical Area with Lasting Retained Memory**

For historic areas with Lasting Retained Memory, the most salient features (including whether to retain areas, influence of demolition, and necessity of reconstruction) are chosen to analyze the influential factors (as shown in Table 2.8). The main factors influencing the urban memory in these historic areas are mainly the age structure of the residents, which significantly correlates at the 0.05 level (bilateral) with a Pearson’s correlation coefficient of 0.314; that is, the older the residents, the more profound the Lasting Retained Memory.

(4) **Type IV: Historical Area with Protection Renewal Memory**

For historic areas with Protection Renewal Memory, the most salient features (including whether renovations reflect the original appearance, whether the original culture is preserved, and whether the original function is preserved) are chosen to analyze the influential factors (as shown in Table 2.9). The main factors influencing the urban memory in these historic areas are the level of education and average income of residents, which significantly correlate negatively at the 0.1 and 0.05 levels (bilateral) with a Pearson’s correlation coefficient of −0.357 and −0.296, respectively. In other words, low education and average income levels produce less awareness in memory continuity of protected and renewed historic areas.

(5) **Type V: Historical Area with Continuous Time Memory**

For historic areas with Continuous Time Memory, the most salient features (including point of time, time section, and time axis) are chosen for the analysis of influential factors (as shown in Table 2.10). The influencing main

**Table 2.8** Analysis of influencing factor in urban memory of historic areas with Lasting Retained Memory (Source ©Authors)

Lasting retained memory	Age	Duration of residence in Beijing	Degree of familiarity	Access to information	Education background	Per capita income
Pearson correlation	0.314 (*)	0.157	0.014	0.039	0.052	−0.104
Significance (bilateral)	0.024	0.266	0.922	0.782	0.715	0.465
N	52	52	52	52	52	52

\* significant of the correlation coefficient

**Table 2.9** Analysis of influencing factor in urban memory of historic areas with protection renewal memory (Source ©Authors)

Protection renewal memory	Age	Duration of residence in Beijing	Degree of familiarity	Access to information	Education background	Per capita income
Pearson correlation	0.081	−0.027	0.177	0.232	<b>−0.357 (**)</b>	<b>−0.296 (*)</b>
Significance (bilateral)	0.570	0.847	0.208	0.097	0.009	0.033
N	52	52	52	52	52	52

\* significant of the correlation coefficient  
\*\* extremely significant of the correlation coefficient

factors are the level of education and familiarity with Beijing, which significantly correlate negatively at the 0.1 and 0.05 level (bilateral), that is, the more the residents are familiar with Beijing, the higher the understanding of the historic area and urban memory level.

**2.5.4 Discussion of Protection and Renewal Strategies of Historic Areas in Beijing**

Based on the analysis of rules for the urban memory related to historic areas in Beijing, as well as the classification of historic areas and analysis of influential factors, the article concludes that existing information on research in historic areas serve as guide to the protection and renewal strategy of historic areas in Beijing (Table 2.11).

**Table 2.10** Analysis of influencing factor in urban memory of historic areas with continuous time memory (Source ©Authors)

Continuous Time memory		Age	Duration of residence in Beijing	Degree of familiarity	Access to information	Education background	Per capita income
Point of time	Pearson correlation	−0.133	−0.020	<b>0.303 (*)</b>	0.139	0.235	0.151
	Significance (bilateral)	0.347	0.887	0.029	0.326	0.093	0.286
	N	52	52	52	52	52	52
Time section	Pearson correlation	0.031	0.135	<b>0.307 (*)</b>	0.101	0.103	0.087
	Significance (bilateral)	0.829	0.340	0.027	0.474	0.469	0.539
	N	52	52	52	52	52	52
Time axis	Pearson correlation	−0.157	0.161	0.099	0.111	<b>0.275 (*)</b>	0.176
	Significance (bilateral)	0.268	0.254	0.486	0.434	0.049	0.213
	N	52	52	52	52	52	52

\* significant of the correlation coefficient

**Table 2.11** Summary of features of and influential factors on urban memory of historic areas in Beijing (Source ©Authors)

Type		Features of urban memory		Influential factors	Typical area
		Strongest	Weakest		
I	Objective dynamic memory	Static elements	Renewal evaluation	Access to information	Shichahai
		Evolutionary elements	Time section		
		Temporal elements	Time axis		
II	Integrated characteristic memory	Characteristic elements	Objective elements	Age structure	Tanzhe temple
		Renewal elements	Time elements		
III	Lasting retained memory factor	Static elements	Subjective Elements Time elements	Age structure	Nan Luoguxiang
		Evolutionary elements			
		Temporal elements			
IV	Protection renewal memory	Static elements	Evolutionary elements	Education Income	Weiming lake and Yan Yuan
		Preserving elements	Characteristic elements		
		Time section	Time axis		
V	Continuous time memory	Static elements	Point of time	Education Familiarity	City wall in ming Dynasty
		Evolutionary elements	Time section		
		Temporal elements	Time axis		

Based on the summary of the characteristics of historic areas, different strategies for the continued, specific, and differential protection schemes in the renewal and regeneration of historic areas are chosen, according to the strongest and weakest features and other influential factors at the urban memory level. In the following part, three out of the five categories of historic areas are discussed in detail:

(1) **Type I, Historic Areas with Objective Dynamic Memory**

**Memory Features:** The Objective Dynamic Memory (Static, Evolutionary, and Temporal Elements) are the leading factors in the preservation of urban memory.

**Protection Strategy:** Focus on the protection of Objective Dynamic Memory, especially protecting weak memory elements, such as time section and time axis, and innovation for differentiated conservation strategies with respect to residents’ access to information.

**Fig. 2.4** Coordination between modern enterprises and the original cultural atmosphere (Source ©Authors)



**Protection Example:** The Shichahai Historical and Cultural Protection Area (Figs. 2.4 and 2.5).

**Continuing Protection:** Controlling and protecting features in the overall style of historic areas; coordinating between modern businesses and the original cultural atmosphere.

**Specific Protection:** Combining the new and existing functional features in Shichahai; planning special festival activities; continuing the original cultural context; carrying out the “Cool Summer,” “Water Village in the North,” “Former residence of celebrities,” and other themed festival activities; and based on existing function, carrying out themed festival activities, such as “Music Bar” and “Creative Culture”.

**Differential Protection:** Increasing people’s experience by organizing festival activities; improving the interpretation system related with object information and time clues within the historical area to enhance the experiences of residents from their own perspective.

**Fig. 2.5** Shichahai ice stadium (Source ©Authors)



## (2) Type II, Historic Areas with Integrated Characteristic Memory

**Memory features:** Integrated Characteristic Memory components (memory of Characteristic and Renewal Elements) as the leading factors in the preservation of urban memory.

**Protection strategy:** Preserving Integrated Characteristic Memory, especially protecting weak memory elements, such as Objective and Time Elements; carrying out differentiated protection based on residents' age structure.

**Protection example:** The Tanzhe Temple.

**Continuing Protection:** Protecting and maintaining the overall features and important cultural factors within the historic area to continue the citizens' consensus of Tanzhe Temple as a carrier of urban memory in Beijing.

**Specific Protection:** Paying special attention to the weak memory elements, such as object and time factors, and controlling the overall style of Tanzhe Temple; through heritage interpretation, enhancing people's recognition of Objective Elements, including Static, Evolutionary, and Temporal Elements, as well as the recognition of major events on point of time, time period, and time axis, such as the overall architectural style and built age (Mandarin: Xi Jin), development (relationship with Buddhism, historical events "Suppression of Buddhism," important characters in history [place where Kublai Khan's daughter got married]).

**Differential Protection:** Protection and renovation should pay attention to a balance between the preferences among people from different age groups.

## (3) Type III: Historical Area with Lasting Retained Memory

**Memory features:** Lasting Retained Memory and Objective Dynamic Memory in good condition (which should be preserved and have positive influence on the urban style of Beijing) as the leading factors in the preservation of urban memory.

**Protection Strategy:** Maintain the Integrated Characteristic Memory of the preserved historic area; protect weak memory elements, such as subjective evaluation and time elements; carry out differentiated protection based on residents' age structure.

**Protection Example:** Historical Area of Nan Luoguxiang (Figs. 2.6 and 2.7).

**Continuing Protection:** Continuing the characteristics of the overall style in the Nan Luoguxiang historical area; strengthening the public's retained synchronic cognition of Nan Luoguxiang and memory of Beijing culture carried by objects.

**Fig. 2.6** Nan Luoguxiang memorial archway (Source ©Authors)



**Fig. 2.7** Chinese scholar tree and traditional architecture  
(Source ©Authors)



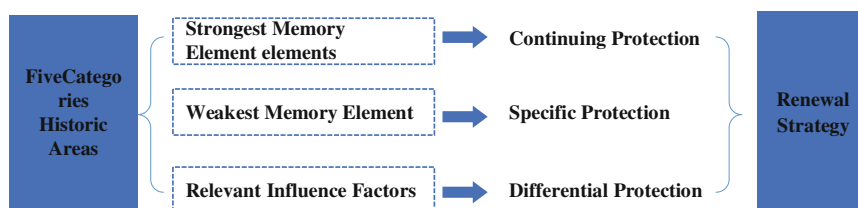
**Specific Protection:** According to the weak memory features of subjective evaluation and time elements, through heritage interpretation, enhance the overall character of the area and important elements, as well as improve the interpretation and popularity of information and major events of time points, time period, and time axis. For example, the “fish skeleton” layout of streets and lanes in Nan Luoguxiang, functions in history “Market in the Back,” story about its name (before Qing Dynasty called Luo Guoxiang, also known as the Wugong Xiang).

**Differential Protection:** Combine the new characteristic into business functions; protection and renewal should pay attention to balance the preferences of people from different age groups.

## 2.6 Conclusion and Discussion

In the context of globalization and rapid urbanization in China, how do we protect and preserve the rich memory of urban historic areas in fast-changing cities? What are the factors influencing the continuity of urban memory features? What are the elements comprising urban memory, and how can their relative importance be determined? Finally, how can these theories be applied to the maintenance and development of urban memory? This study uses a selection of 367 historic areas within the domain of Beijing in a basic database and 19 typical areas as samples, and then establishes the framework of measurement and application of urban memory of historic areas in Beijing to form a comprehensive method and theoretic guidelines for the preservation of historic areas and continuity of urban memory. The study has reached the following two conclusions:

- (1) This work identifies five major categories of urban memory related to historic areas in Beijing, namely, Objective Dynamic Memory, Integrate Characteristic Memory, Continuous Time Memory, Lasting Retained Memory, and Protection Renewal Memory factors.
- (2) Based on the extraction of five main factors, the sample historic areas are divided into five major categories. The research summarized the rules and



**Fig. 2.8** Renewal strategy of historic areas under five categories (Source ©Authors)

influencing factors for urban memory in each category, as a reference to historical continuing, specified, and differential protection (Fig. 2.8).

Historic areas are the carriers of physical and mental cultural information. The study on the measurement of urban memory reveals the underlying essence beneath the phenomenon, thus providing a scientific guide to the determination of crucial elements in the protection and renewal of historic areas. The study reflects the features and properties of historic areas per se. In practical planning, a guidance and protective planning project can be created based on the existing memory features. The protection method based on the urban memory measurement proposed in this research is of universal significance, which could serve as a reference to the protection of other historic areas.

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