

## Impact of heterogeneous reuse on heritage value under the perspective of scale subdivision -- Two modern theatres in Nanjing as examples

Yikuan HAN<sup>1</sup>, Xiaoxi LI<sup>2</sup>

<sup>1</sup> School of Architecture and Urban Planning, Chongqing University, China; Key Laboratory of New Technology for Construction of Cities in Mountain Area, Ministry of Education, China.

<sup>2</sup> School of Architecture, Harbin Institute of Technology, Shenzhen, China.

### Abstract

*Heterogeneous reuse is a type of reuse where the demand for new functional space differs significantly from the supply of the original space. It causes changes in the building morphology at all scale levels, which in turn has an impact on heritage value. Heterogeneous reuse is prevalent in the conservation of modern Chinese architecture, this article analyses the mechanism of heritage value change under different intervention methods, taking the Shengli Theatre and the Dahua Theatre in Nanjing as examples. Firstly, the value-bearing areas are identified by overall value assessment; secondly, the value of each value-bearing area at each scale level is determined by combining the theory of scale subdivision; Thirdly, influences of different interventions on the value of overall building and the value bearing parts are calculated by comparing the value changes before and after conservation and renovation. This research reveals that heterogeneous reuse often leads to a decline in the emotional and cultural value of built heritage, but enhances the use value. The overall value may also increase if done in appropriate ways. Through this article, the potential of typomorphology in the study of heterogeneous reuse is expanded, and through the integration of scale subdivision and value assessment, the specific heritage values at each scale level can be fine-expressed, while the effectiveness of various interventions can be reasonably evaluated.*

**Keyword:** Scale subdivision, Heterogeneous reuse, Evaluation, Modern architectural heritage.

### Introduction

Since the 1990s, the conservation of twentieth-century architectural heritage has garnered increased international attention (UNESCO, 2003), The protection of twentieth-century architectural heritage on a broad scale began in China in the 2000s, and a national consensus was created in the 2010s (Jin, 2018). Due to its abundance, vast geographic spread, and the fact that the majority of it is still in use, the concept of adaptive reuse has been introduced to accomplish sustainable conservation by endowing architectural heritage with new functional and economic value (ICOMOS, 1999). This adaptation refers to repurposing a building's function while preserving the building's primary structure to the greatest extent possible (Douglas, 2006). In actuality, however, functional upgrades or adjustments result in modifications to space needs, resulting in transformations at scale levels of material, structure, room cell, and building. This style of reuse with a large gap between new functional space demand and original space supply is referred to in this article as heterogeneous reuse. Two 1930s movie theatres in Nanjing are typical examples of heterogeneous reuse; one was demolished during urban redevelopment, but its street façade was rebuilt as a curtain wall attached to the new structure; the other was functionally upgraded, converting its large auditorium into seven smaller

cinema halls. The heritage value of is inextricably linked to its architectural morphology. The terms "building material," "structural elements," "room cell," and "building" refer to four often used architectural scale levels in typo-morphology's scale subdivision of the built environment (Kropf, 1993).

This article examines the changes in the value of various components and scale levels of these two movie theatres as a result of various interventions. The second half discusses the brief history of the two theatres and the different ways of intervention, while the third piece discusses the methods of value assessment. The fourth section contains the evaluation's findings. The conclusion summarizes the association between intervention mode and value change and suggests future study directions.

## **Background**

The Shengli Theatre and the Dahua Theatre were two major Nanjing movie theatres that shared much yet had two distinct interventions in recent years. Both theatres were constructed in the 1930s, were designed in the popular style of the era by renowned architects, and served as high-end entertainment facilities popular with the upper class. They were well-managed and among the best in Nanjing's theatre sector from the 1930s through the 1990s. From the 1990s on, both companies' financial status deteriorated gradually until they were forced to close their doors. The Shengli Theatre was sadly destroyed in 2004 and partially reconstructed in 2015, while the Dahua Theatre began conservation and rehabilitation work in 2010. After much negotiation and compromise, the former ultimately adopted a facadism strategy, suspending a new material simulation of the old street façade over the existing commercial plaza structure in order to revoke its historical existence (Han & Zhou, 2021); the latter employed a volumetric preservation strategy, retaining the shell and front hall but reconfiguring the multifunctional auditorium (Zhou et al., 2012).

The Shengli Theater's antique street façade was only restored. At the material level, a new material (GRC panel) in a similar color to the original material (red brick) was used; at the structural level, a curtain wall structure was used in place of the original masonry structure; at the room cell level, the original style was restored; and at the building level, while the street façade was restored to its original dimensions, it appeared small due to its attachment to the huge new building structure.

The Dahua Theatre's shell, the entrance hall, was retained but the multifunctional auditorium was dismantled. The major components perform the following functions. (1) On the street façade, the original materials and structural elements were retained and repaired; on the room cell scale, the original style was retained, while unauthorized structures and billboards were removed, the messy electrical wires and pipes were cleared, and the entire façade was cleaned and repaired. (2) The front hall: at the material scale, new paint and coatings were applied in colors similar to those used when the building was constructed; at the structural scale, the original structural form was retained; and at the room unit scale, debris was cleared, damaged areas were repaired, and the original style was retained. (3) The auditorium: on the material scale,

new reinforced concrete was used; on the structural scale, new structural and construction methods were used; and on the room cell scale, the original large auditorium was divided into two floors in 1992, with the lower level serving as a shopping mall and the upper level serving as a smaller auditorium. The rehabilitation included the destruction of the auditorium and shopping Centre, as well as the redesign and building of seven smaller movie halls to house the advanced projection technology, all decorated in a Chinese-deco style to match the front hall. Additionally, lifts and escalators were added throughout the refurbishment.

The Shengli Theater ceased to operate as a theatre entirely and was converted into a façade decoration, while the Dahua Theatre was converted into cineplexes. The diversified uses, which results in a variety of spatial and architectural changes, has a considerable impact on the heritage value of the structure.

## **Methodology**

Contemporary conservation has shifted from an obsession with authenticity and integrity and toward the preservation of historic values and meanings (Vinas, 2004). The value assessment of heritage is a prerequisite for determining the content, intensity, and measures of conservation (Feilden, 2003), the impact of various interventions on the heritage value must also be assessed both before and after conservation. To begin, this article determines the bearing portion of the value through an overall value assessment. Secondly, the value of each component is established through the use of the scale subdivision theory. Thirdly, the effects of various interventions on the overall worth of the building and its value-bearing components are determined by comparing value changes prior to and after conservation and renovation.

This article proposes three levels of value indicators for the value assessment of the entire building based on the Feilden value system (emotional, cultural, and use). Additionally, it is paired with scale subdivision to create a full scoring scale for each scale level and part. Each indicator is graded on a ten-point scale and classified into five categories: no value (0), low value (1-3), medium value (4-6), high value (7-9), and extremely high value (10). Five specialists were invited to perform a detailed study of the Shengli Theater before to and following its demolition, as well as to examine its pre- and post-demolition street façade at the material, structural, and room cell scales. Three experts were invited to evaluate the Dahua Theatre's overall value before and after renovation, as well as its street facade, front hall, and auditorium before and after conservation at the material, structural, and room cell scales.

## **Results and Discussions**

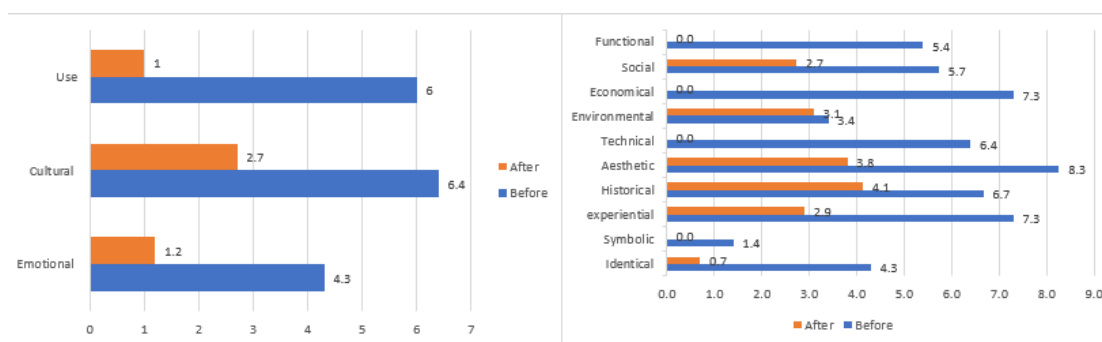
### **The Shengli Theater**

#### ***Overall value change***

Although the reconstruction of the Shengli Theater restored some value, its score on each indicator was significantly lower than that of the original theatre.

Prior to demolition, its overall value score was 5.6; cultural value was the highest (6.4), followed by use value (6.0) and emotional value (4.3). The artistic, historical, and technical values were all higher (8.3, 6.7, and 6.4) than the other indicators under cultural value. Economic value was the highest indicator (7.3) under use value; memory/experience value was the highest indicator (7.4) under emotional value. The street façade and the front hall had higher emotional, artistic, environmental, and social values; the auditorium had higher technical and economic values.

All the Shengli Theater's values were lost during its demolition and were partially restored during its façade reconstruction, but the overall score (1.7) was significantly lower than it had been previously. Cultural value (2.7) was slightly higher than emotional value (1.2), followed by use value (1.0). Among the secondary indexes, historical value recovered to a moderate level (4.1), while aesthetic value (3.8), environmental value (3.1), emotional value (2.9), and social value (2.7) also improved slightly.



**Figure 1:** Overall value changes of the Shengli Theater. Drawn by authors.

### **The value change of the street façade**

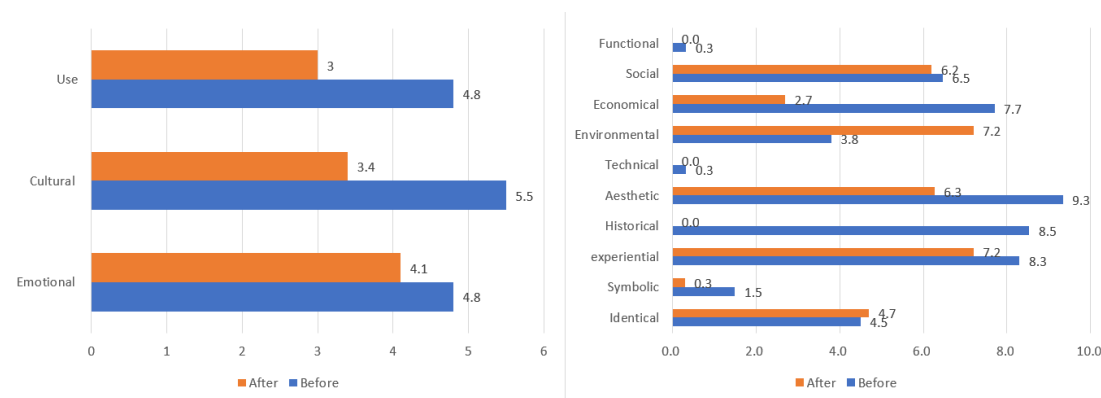
The street façade's value improved at the material and structural scales, but though its value rebounded at the room cell level, none of the indicators approached the original score.

Prior its demolition, on the material scale, the street façade scored highest in cultural value (first-level index), as evidenced by its second-level indicators such as historical value (0.9) and technical value (1.7). on the structural scale, it also scored in terms of cultural value, as evidenced by its second-level indicators such as historical value (0.9), aesthetic value (2.2), and technical value (2.7). At the room cell level, the greatest score was for cultural value (5.5), while emotional and use values were equal (both 4.8). Among the secondary indices, aesthetic value (9.3), historical value (8.5), emotional/experiential value (8.3), and economic worth (7.7) were all greater than the other indicators.

Following the reconstruction of the street façade, only the technical value (secondary index) was assigned a score under the index of cultural value (first-level index) (2.7). At the structural scale level, it had only cultural value scores (first-level index), which were mirrored in the two second-level indices of artistic value (2.9) and technical value (5.9). At the room cell scale, emotional value was ranked highest (4.1), followed by cultural

value (3.4) and use value (3.0); among secondary indicators, emotional/experiential value and environmental value were ranked highest (both 7.2), followed by artistic value (6.3) and social value (6.2).

The renovated facade lost historical value on the material scale, but gained technical worth as a result of the sophisticated materials used. It also lost its historical worth on the structural level, but its artistic and technical values were improved as a result of its high-end design and construction, advanced building structure and technology. At the room cell scale, all values in the first-level index had been restored, although none had reached their pre-demolition level. Among the secondary index, environmental and social values grew as a result of environmental beautification, while emotional/experiential and artistic values were largely restored.



**Figure 2:** Statistics on the value changes of street façade, the Shengli Theater. Drawn by authors.

## The Dahua Theatre

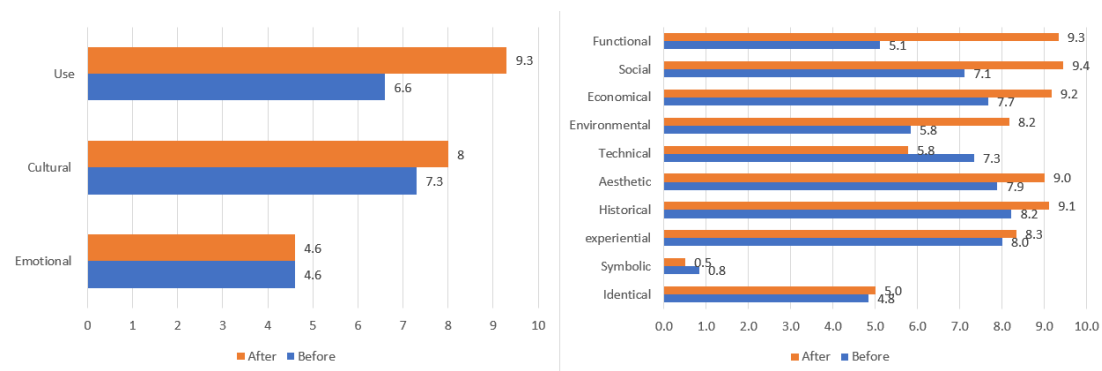
### Overall value change

The interventions made to the Dahua Theatre boosted its heritage value in general and enhanced its use value in particular.

Prior to renovation, its total value score was 6.2; cultural value was the greatest (7.3), followed by use value (6.6) and emotional value (4.6). Under cultural value, the secondary sectors such as historical value, aesthetic value, and technical value were all greater than the others (8.2, 7.9, and 7.3, respectively). Economic value (7.7) and social value (7.1) were greater than other indexes in the use value category; memory/experience value (8.0) was higher in the emotional value category. The street facade and front hall received high marks for emotional, historical, artistic, and environmental importance. Technical and economic value were both high for the auditorium.

Following renovation, the total score rose to a higher level (7.3 points). Among the first level indexes, use value was the highest (9.3), followed by cultural value (8.0) and emotional value (4.6). Social value (9.4) was

the highest of the secondary indicators, followed by functional value (9.3), economic value (9.2), historical value (9.1), and artistic value (9.0).



**Figure 3:** Overall value change statistics of the Dahua Theater. Drawn by authors.

The refurbishment of the Dahua Theater boosted the theater's overall heritage value, most notably its use value (which grew by 2.7), but also its secondary indices like as economic, social, and functional values, which all improved significantly. Additionally, the cultural value was somewhat raised (by 0.7), as were its secondary indices such as historical value, aesthetic value, and environmental value (increased by 0.9, 1.1 and 2.2, respectively). The emotional value remained constant, as did its secondary indications such as identical value, symbolic value, and emotional/experiential value. However, with the demolition of the large-span auditorium, the technical value reduced (by 1.5).

***The value change of the street façade, front hall, and auditorium***

The street facade and front hall were maintained and repaired, enhancing its heritage value. Heterogeneous repurposing of the auditorium increased its utility worth significantly, but severely diminished its emotional and cultural significance.

The figures indicate that following maintenance and repair of the street facade, its value at the material and structural scales remained unchanged, but its value at the room cell scale increased. More precisely, the use value, cultural value, and emotional value all increased (1.8, 1.0, and 0.7 respectively). Secondary indices such as environmental, social, economic, and emotional/experiential values also increased significantly (3.0, 2.6, 2.5, 1.7 respectively).

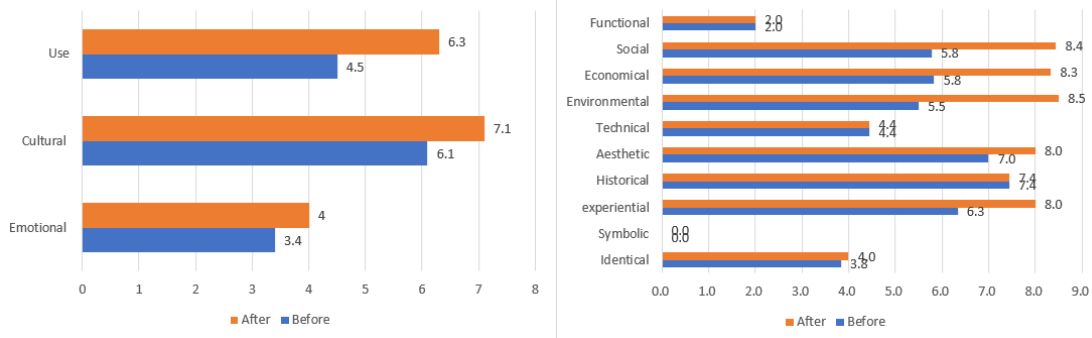


Figure 4: Statistics on the value change of street façade, the Dahua Theater. Drawn by authors.

Following maintenance and repair, the front hall's worth declined on the material and structural scale, but climbed on the room cell scale. The use value grew the most (2.9), and all of its second-level indicators improved significantly; the emotional and cultural values grew modestly as well (0.3 and 0.1 respectively).

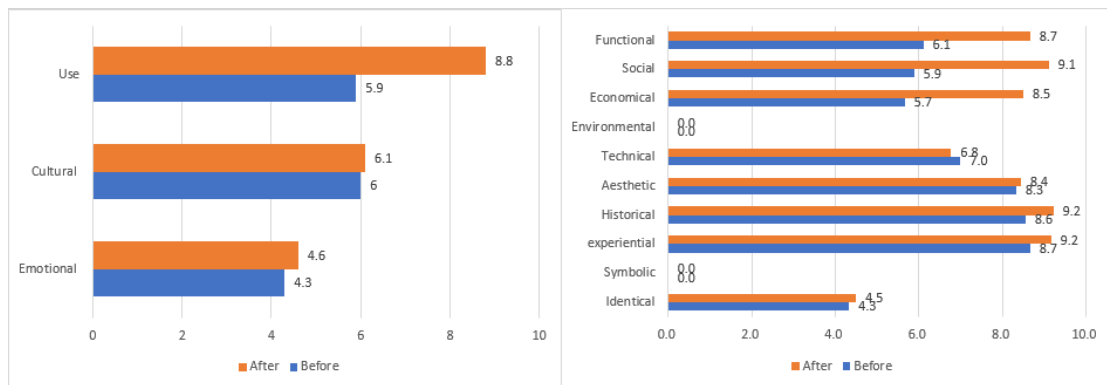


Figure 5: Statistics on the value change of the front hall, the Dahua Theater. Drawn by authors.

Following maintenance and restoration, the auditorium's value on the material and structural scales declined significantly. At the room cell scale, its overall value declined as well; notably, its cultural and emotional values declined significantly (2.7 and 1.6, respectively), as did its secondary indices. However, the use value was greatly enhanced (by 2.8), as were the second-level indications.

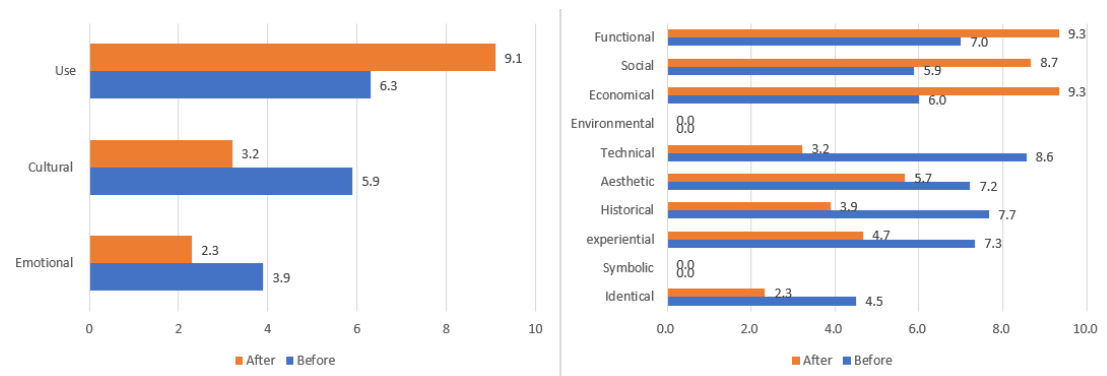


Figure 6: Statistics on the value change of the auditorium, the Dahua Theater. Drawn by authors.

## Conclusions

Heritage conservation is a delicate art that frequently seeks to improve certain values at the expense of others. Heterogeneous reuse is a popular method to modern building conservation in China, one that frequently results in a loss of emotional and cultural worth, but also increases the building's use value, and if done well, its overall value. In terms of scale levels, the higher the scale level, the more nuanced the value connotation. Lower levels, such as material and structure, contain a few value items, but higher level, such as room cell, contains a high concentration of value content.

The case of the Shengli Theater demonstrates that, rather than doing nothing, reconstruction adds some worth, although it is still a long way from the pre-demolition value. The Dahua Theatre is a frequent example of heterogeneous reuse, in which a significant alteration of a portion of a building space is carried out in order to adapt to new functional needs. This technique increases the building's overall value, but most obviously its use value.

The theory of scale subdivision is demonstrated in this research to be significant in the study of heterogeneous reuse. Through the integration of scale subdivision and evaluation, the specific manifestation of heritage values at each scale level can be fine-tuned, while the success of various interventions can be appropriately evaluated. In the future, the scale subdivision theory is projected to be combined with the conservation design industry to achieve revised design guidelines.

## References

1. DOUGLAS, J. 2006. *Building Adaptation*, London, Routledge.
2. FEILDEN, B. M. 2003. *Conservation of Historic Buildings*, Burlington, MA, Architectural Press.
3. HAN, Y. & ZHOU, Q. Reconstruction of the Shengli Theater in Nanjing: a case of facadism. RRAH 2021 CONFERENCE, 2021 St. Petersburg.
4. ICOMOS 1999. *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance*. In: ICOMOS (ed.). Australia: Australia ICOMOS Publication.
5. JIN, L. 2018. The identification and value analysis of 20th century architectural heritage projects in China. *China Cultural Heritage Scientific Research*, 6.
6. KROPF, K. 1993. *An enquiry into the definition of built form in urban morphology*. University of Birmingham.
7. UNESCO 2003. *Identification and Documentation of Modern Heritage*, Paris, UNESCO World Heritage Centre.
8. VINAS, S. M. 2004. *Contemporary Theory of Conservation*, Oxford, Butterworth-Heinemann Elsevier Ltd.
9. ZHOU, Q., LIN, J. & WANG, W. 2012a. Design Issues in the Conservation of Historic Architecture-- Preservation and Renovation of Dahua Theatre. *Architecture and Culture*, 4.