



# The Impact of Design Characteristics on the Psychological Connection Between the Heritage Building and its Occupants

Zahraa Ahmed<sup>1</sup>, Saba Sami Al Ali<sup>2</sup>

## **Authors affiliations:**

1) Dept. of Architecture Eng.,  
College of Engineering, Al-  
Nahrian University, Baghdad,  
Iraq  
[Zahraahmed327@gmail.com](mailto:Zahraahmed327@gmail.com)

2\*) Dept. of Architecture Eng.,  
College of Engineering, Al-  
Nahrian University, Baghdad,  
Iraq  
[dr.saba.sami@nahrainuniv.edu.iq](mailto:dr.saba.sami@nahrainuniv.edu.iq)

## **Paper History:**

**Received:** 20<sup>th</sup> Oct. 2023

**Revised:** 22<sup>nd</sup> Nov. 2023

**Accepted:** 11<sup>th</sup> Aug. 2024

## **Abstract**

Heritage buildings are part of the connection between the past and the present. By paying attention to their occupancy, we keep the present and future generations in touch with what our ancestors achieved, hence sustaining them being part of the living heritage. Restoration and renovation procedures must be carried out to make them capable of meeting contemporary needs. However, it is essential to recognize the architectural characteristics that resonate with long term occupants. This research focuses on the effect of design characteristics on the psychological relationship between heritage buildings and their occupants, through case studies of two heritage buildings in Baghdad. The first is the previous Theological college building of Al al-Bayt University of the 1920s, now the College of education for girls, and the second is the 19th century Ottoman Al-Qishla building. The study relies on conducting a questionnaire for the occupants about their response to design characteristics of each building. The questionnaire concluded that the design characteristics of the heritage building have a significant impact on the psychological response of its occupants. The majority of respondents indicated that characteristics such as clarity of function, clarity of elements, sense of security, privacy, and flexibility, were satisfactory. The majority of respondents expressed appreciation for heritage buildings, as well as positive evaluations and appreciation for the reflection of the past in these buildings, indicating that "architectural characteristics of the heritage building" has a significant impact on the psychological connection felt by the occupants of the heritage building.

**Keywords:** Heritage Buildings, Psychological Relationship, Design Characteristics, Occupants' Appreciation.

## تأثير الخصائص التصميمية على الارتباط النفسي بين المبنى التراثي وشاغليه

زهراء أحمد رزيح ، صبا سامي العلي

الخلاصة:

تعد المباني التراثية جزءاً من اتصال الماضي بالحاضر فمن خلال الاهتمام بإشغالها نبي الأجيال الحاضرة والقادمة على اتصال بما وصل إليه الأجداد. وتعد جزءاً من التراث الحي لذلك لابد من إجراء أنشطة ترميم وتجديد لجعلها قادرة على تلبية الاحتياجات المعاصرة، ولكن لابد من التعرف على الخصائص التصميمية المعمارية التي تحصل على تعاطف شاغلي مثل هذه الأبنية وتؤثر على علاقتهم النفسية مع المبنى. تم في هذا البحث دراسة تأثير الخصائص التصميمية على العلاقة النفسية بين المباني التراثية وشاغليها لفترة طويلة أو متكررة للعمل أو الدراسة أو غيرها. بعد التعريف بالأفكار النظرية الرئيسة تمت دراسة حالة لمبنيين تراثيين في بغداد، الأول هو مبنى كلية التربية للبنات، الشعبة الدينية لجامعة آل البيت سابقاً، والثاني هو مبنى القشلة العثماني من خلال إجراء استبيان لشاغلي المبنيين حول تعاطفهم مع خصائصها التصميمية. وخلص الاستبيان إلى أن الخصائص التصميمية للمبنى التراثي لها تأثير كبير على الارتباط النفسي لشاغليه. أشار أغلبية المستجيبين إلى أن الخصائص مثل وضوح الوظيفة، ووضوح العناصر، والشعور بالأمان، والخصوصية، والمرونة، كانت مرضية. وغالبية أفراد عينة البحث يقدرون المباني التراثية، وهناك نسبة عالية أعربت عن تقديرات إيجابية وتقدير لانعكاس الماضي في هذه المباني. إن لمتغير "الخصائص المعمارية للمبنى التراثي" تأثير كبير على ارتباط شاغلي المبنى التراثي نفسياً به.



## 1. Introduction

The relationship between individuals and their environment is recognized as a pivotal factor in contemporary environmental approaches that prioritize the quality of human life. [1] Occupants of Heritage buildings may develop a response to their place that is characterized by multiple psychological dimensions, such as belonging, cultural pride and personal identity. This response appears through joy, attachment, and optimism, which are forms of emotion that generate satisfaction. However, to be convenient for contemporary uses, heritage buildings require ongoing rehabilitation and renovation interventions. In this context, it becomes necessary to understand the design aspects that influence occupants' satisfaction in heritage buildings that are in continuous use, especially when occupants spend long hours working, studying, or living in these spaces.

In this article, we will review previous literature that addressed the psychological connections with heritage buildings to identify the state of art on this topic. We then move to discussing the basic concepts of heritage authenticity and fundamentals of interventions needed for reusing heritage buildings to contemporary needs, then we identify the main influential design aspects to be assessed by occupants. Two cases of heritage buildings, namely the previous Theological college building of Al al-Bayt University of the 1920s, now the College of education for girls, and the second is the 19th century Ottoman Al-Qishla building. Response of occupants of these two buildings is evaluated through a questionnaire to identify the design aspects that are more influential in the psychological connection with the building.

## 2. Literature Review

Over the past decades, a body of research has emerged, affirming the existence of emotional and, consequently, psychological connections between heritage buildings and individuals. Understanding these psychological relationships influences conservation practices, interventions, and the general behaviour of individuals. The ultimate goal of this understanding is to integrate these places for the public good and improve the quality of human life [2-4].

These studies have varied in measuring and understanding the nature of the psychological relationship. Some have categorized this relationship based on the levels of influence that range from satisfaction with the place to feelings of belonging and attachment, as seen in studies by [5-8].

Building upon the literature in environmental psychology, the study [9] identified the factors influencing the psychological relationship between occupants and heritage buildings, including two dimensions: the individual dimension, meaning the occupant, and the place dimension which is the heritage building.

Most studies have emphasized dealing with the physical characteristics of heritage buildings, particularly in cases of reuse, to preserve the values that represent the authenticity of these buildings. Examples of such studies include [10-13]. In contrast, there are relatively few studies that have focused on

the psychological response of occupants, and how they respond to the physical and material aspects of heritage buildings or sites. For instance, [14] highlighted the role of changes in physical elements, such as interior design interventions, in altering the sensory and psychological effects on occupants of reused buildings. Other studies, such as [15] and [16] stressed the importance of maintenance and caring for the physical condition of heritage buildings to gain people's satisfaction. The study [17] investigated the impact of four factors on the satisfaction of occupants in a reused heritage building as a school, including interior design, indoor environmental quality, service quality, and the clarity of the building's authenticity.

It became clear that the psychological relationship between heritage buildings and their occupants, particularly in the context of conservation of design features, requires further study. This research aims to contribute to this field of knowledge by aligning with studies that highlight the importance of considering the perspectives of heritage building occupants. The study seeks to identify the key architectural and design characteristics that influence the connection between heritage buildings and their occupants and to evaluate the most impactful aspects of this relationship.

## 3. Basic Concepts:

In this section, we will discuss the basic concepts related to the values and authenticity of heritage buildings and what distinguishes these authentic buildings in terms of aspects of design. We will also cast light on how to equip or prepare heritage buildings for contemporary use, as these operations can affect the design elements that are psychologically relevant to the occupants of these buildings.

### 3.1. The Values of Authenticity of the Heritage Buildings

Generally, authenticity is attributed to historical buildings, which are either original in material or kept as originally constructed. Authenticity can also be understood concerning the creative process that produced them, considering them as genuine products of their time and encompassing the influences of the historical context. Authenticity comes in various forms, including:

1. Design Authenticity: This pertains to the architectural designer's approach in responding to requirements, leading to the creation of a work of art that follows the historical evolution and the expansions added to the historical building if executed correctly [18](Taher, T. D. M. S., et al., 2020)
2. Material Authenticity: It is measured by the integrity of the primary materials. The presence of the original material in the heritage resource serves as a criterion for measuring material authenticity. Historical interventions can add value to heritage if they highlight the unique features of their time [19].(Rosado, M. R. A., & Walliman, N. S. R., 2014).
3. Construction Authenticity: It is revealed through the use of construction techniques and skills of the era in which the resource was built



4. **Quality of Setting Authenticity:** It measures the value of the building and its level of harmony with the location or the complex in which the monument is situated. In other words, it indicates the level of impact or influence of the monument on the surrounding environment [10].

The values that are expected to be revealed in an authentic heritage asset are as follows:

**Cultural Value** represents the identity of each society and people's perspective on a particular phenomenon. The culture of a society is hidden in its cultural values and heritage [20]. Architectural heritage has significant potential for building or rebuilding identity, developing culture, promoting ethics, and enhancing social well-being. This potential makes architectural heritage a social asset that can be defined as social wealth [21]. In the Burra Charter, the cultural significance of heritage refers to a range of aesthetic, historical, scientific, social, and spiritual values for past, present, and future generations, defined by the local community based on culture, identity, spiritual significance, and social well-being preserved for future generations [22].

**Emotional Values:** These values manifest through various emotions, such as amazement, self-wonder, continuity, and symbolism. They involve preserving emotional appreciation between the building and its occupants or the surrounding community, achieving interaction between the viewer and the place, and coexistence between meaning and the receiver [23].

**Historical and Temporal Values:** These values are linked to the time of construction of the building and its historical age. The older the building, the higher its historical value, as historical buildings or areas may be associated with a specific period of time or express a history linked to unique national and historical events [24].

**Architectural Aesthetic Values:** preserving the architectural styles present in these buildings, whether in design elements, construction, or the use of specific materials, which represent the architecture of that era [9].

**Symbolic Memorial Values:** Some heritage buildings hold symbolic values related to past events relevant to the collective memory of the community [24].

### 3.2 Fundamentals of interventions in Heritage Buildings for Contemporary Use

The process of preparing a historical building for contemporary use involves a set of criteria that efficiently contribute to determining the best use for such buildings, which should not negatively impact their architectural and heritage value while ensuring its functional performance for the longest possible period, as follows [25],[26],[27]:

- 1-Renewal should be harmonious with the architectural configuration of the heritage building, as well as with the architectural and cultural character of the city. The surrounding area of the historic building should also necessitate this renewal to aid in its continuity and preservation.
- 2- The new use must be in line with the historical and artistic value of the building. Therefore, the

original uses of heritage buildings are considered the best uses as they reflect the period in which the building was constructed and express the purpose for which it was built, while being suitable for its historical and artistic value.

- 3-The selection of the new function or character of the building should be based on its social, cultural, or economic returns. This transforms the heritage building into a source of financial resources, ensuring the sustainability of maintenance operations.
- 4- Architectural suitability for the heritage building should result from studying and analyzing several elements, such as adapting the shapes and sizes of interior spaces to accommodate the requirements of the new functional, cultural, and security elements without negatively affecting the building's structural or aesthetic aspects. These elements should not distort the building, its artistic components, or pose any risks to it.
- 5- Structural suitability involves aligning the proposed use of the heritage building with the construction system used in its original construction, ensuring that the new character of the building does not involve a large number of permanent users, either inside the building or in its surrounding areas. The density of users in the heritage building should be in line with the allowable structural limits.
- 6- The designer should choose the most suitable styles of furniture necessary for use, drawing inspiration from the artistic features of the furniture found in the building or from the same era in which it was constructed.
- 7- When renovating a heritage building, it should have a return that is related to its location in the city. The more popular the new character, the closer the selected heritage building should be to the main streets.
- 8- The new use or character should be linked to the building's space, voids, and location, so that the proposed renewal does not require any additions to the building. There should be a perfect match between the spatial requirements of the building and the requirements of the renewal and its consequences.
- 9- Avoiding the repetition of new uses in close proximity and ensuring that the new function does not have negative repercussions in the form of pollution or water leakage.
- 10- As much as possible, the new use should be similar to the original function, and the proposed function should ensure the continuity of maintenance and regular maintenance of the heritage building.

It is evident from the above that the types of interventions that heritage buildings undergo primarily involve dealing with their architectural design characteristics. Therefore, it is necessary to identify these characteristics and the nature of the relationship of those involved with them to guide intervention decisions that ensure a balance between functional and psychological requirements simultaneously.



## 4. Dimensions of the Study

This study involves two variables, the first being the independent variable representing design characteristics of the place, and the second being the dependent variable representing psychological relationships and emotional aspects. We will talk about the dimensions of each of them in this paragraph

### 4.1. Design Characteristics of the Place

Several studies, such as [9], [28], [29], [30] and [31] have identified design characteristics related to the perceived spaces of heritage buildings that contribute to the psychological well-being of occupants. These characteristics include five Dimensions :(clarity, Flexibility, safety Physical characteristics of the place). They are to be explained below.

#### 4.1.1. Clarity

The physical form attributes effectively contribute to achieving the concept of clarity. Clarity is one of the most important shape-related factors that distinguish an element from its surroundings. It encompasses elements like color, lighting of spaces, texture, and scents [31]. Other studies define clarity as the degree of differentiation that enables the observer to describe everything in the environment [32].

According to [30], clarity is defined as a place created to be clear in function, involving clarity in spaces, functions, materials, and textures. Abbas and Wajeeh (2010) find alignment between the definition of clarity of buildings from the outside and clarity of buildings and spaces from the inside within the same concept. They also note that the clarity of the overall mental image of space helps in understanding the complexity that accompanies the (individual part) as opposed to the cohesion of the (larger model). Clarity in this relationship is what provides distinctiveness and uniqueness with the potential for comprehensive and extensive reading of the building and spaces, helping to define the areas. The clarity of the mental image is influenced by factors such as prior experience, memory, and memories, as well as environmental organization or context that is influenced by preference factors (Abbas and Wajeeh, 2010, p. 14).

#### 4.1.2. Flexibility

Interior design flexibility plays a significant role in ensuring occupants' psychological comfort. It refers to the ability to modify spatial configurations, room layouts, and furniture placement based on varying needs, such as accommodating family growth in residential buildings or adapting to an increased workforce in office settings. Flexibility in controlling the configuration of a home or workspace fosters satisfaction, positive emotions, and productivity among occupants [31]. The feasibility and flexibility of design, enabling modifications in the shape and size of interior spaces, are intricately linked to the physical and psychological comfort of occupants. Such environments act as platforms for happiness and human flourishing, combining positive emotions and optimal human performance. Work environments, educational settings, and healthcare facilities particularly benefit from incorporating flexibility [29].

#### 4.1.3. Privacy

Privacy in architecture refers to design choices that create a sense of security in physical spaces. It is an

essential human need that should be addressed in various settings, including residences, workplaces, and educational institutions. Lack of privacy can lead to feelings of anxiety, anger, insecurity, and discomfort, resulting in negative attitudes toward the surrounding environment [31] and [29]. Privacy can be achieved through both audio and visual isolation [29].

#### 4.1.4. Safety

Ensuring safety, security, and adherence to healthcare standards in construction has a significant psychological impact, particularly when vulnerable age groups such as children, the elderly, and individuals with special needs are present. Inadequate architectural design can lead to accidents, affecting not only these age groups but also young individuals. Buildings perceived as safe provide considerable psychological and social benefits, serving as secure refuges from the outside world. They facilitate the development of personal and communal identities while providing individuals with a sense of authenticity. Any disruption caused by external factors undermines this sense of security and control, reducing the psychological and social well-being of occupants. Exposure to such pressures can have both short-term and long-term effects [29], [28].

#### 4.1.5. Physical Characteristics of the Place

The emotional connection and attachment between occupants and a building, encompassing a sense of place, depend on various factors that influence its performance. Understanding the material characteristics of a place is crucial in achieving occupant satisfaction and psychological comfort. These characteristics play a significant role in constructing the mental map and comprehending spaces. Material characteristics encompass elements such as colour, size, texture, visual effects, scents, doors, marks on surfaces, quality of materials, sounds, and sensory properties associated with materials. The presence of focal points, visually diverse elements, and a sense of containment are also relevant considerations [32-36].

### 4.2. Emotional Variables (Psychological Relationship)

Emotions and feelings play a crucial role in assessing historical buildings. These emotions, generated when a person is in a heritage building, include feelings of joy, excitement, attachment, comfort, nostalgia for the past, and a sense of delight [9]. These emotions later influence an individual's behavior, such as approaching or forming an emotional connection with the environment, or avoidance [37].

Feilden in his study [23] "Conservation of Historic Buildings" that the emotional and moral value of the heritage building should be taken into consideration when evaluating it. These emotional values include wonder, continuity, identity, respect, dignity, and symbolism.

The links are formed when a place possesses a unique set of characteristics and attributes—both visible, representing design elements, and invisible, representing moral, cultural, and social values—that provide meaning to the location. This makes a city, town, or building different from others and worthy of



attention. It also makes individuals feel psychological comfort when present in a building. It is a multi-dimensional brief evaluation that encompasses personal beliefs about a place, often represented as "place identity," emotions (place attachment), and behavioral commitments. Based on this idea, the components of a sense of place are understood as place identity, representing individual beliefs about a place [8].

Psychologists have pointed out that physical components play a significant role in building a sense of place, with immediate and long-term effects on human behavior and mental and physical health. Therefore, psychologists, architects, and designers must consider these elements to generate emotional and functional attributes of places simultaneously. They have also pointed out that the purpose of place design is not only to facilitate daily activities but also to provide important emotional symbolism and connections to attract more people to places. The comprehensive quality of environments is measured through their psychological and social richness and cultural significance, while the physical aspect includes comfort, safety, and performance standards [38]

The study [39] suggests that there are two types of visitors or occupants of buildings based on their nostalgia: existential nostalgia (which involves a person's internal feelings, such as nostalgia for specific memories) and aesthetic nostalgia (which pertains to the characteristics, attributes, and style of heritage buildings). Thus, the emotional perception of a heritage building affects the moods of joy and excitement and, subsequently, the behavioral approach of occupants as a response to a specific environment and a desire to stay [40].

## 5. Research Methodology

After reviewing the literary studies that dealt with the subject, as well as the basic concepts of the authenticity of heritage buildings and the foundations of preparing heritage buildings for contemporary use, we can now say that the impact of design characteristics on the psychological relationship between heritage buildings and occupants is worthy of study, which we will do in this article through the following methodology:

### 5.1. Samples and Participants

The sample buildings for this research paper were selected based on several criteria. These buildings are still in use to this day for long hours, with a high occupancy rate and a large number of beneficiaries. They also exhibit functional stability in terms of the continuity of the functions they were originally established for or their adaptation to new uses. The selected buildings for the study have undergone maintenance and renovations to ensure they continue to fulfil their functions and keep pace with the developments of the era to meet the contemporary occupants' needs.

Moreover, these buildings are occupied by diverse individuals during their stay, representing a variety of educational and cultural backgrounds. Consequently, the research chose two buildings with different architectural styles. The first building is the Religious

Department Building at Al-Al-Bayt University, currently part of the College of Education for Girls, located in Al-Adhamiya, the capital of Baghdad. The second building is the Qishla Building in the New Hasan Pasha area of Baghdad.

The current research focused on these buildings for the reasons mentioned above, aiming to determine the correlation between their occupants.

### 5.2. Measures

This research employs a quantitative methodology to establish the relationship between two variables: (1) the independent variable representing design characteristics, and (2) the dependent variable representing psychological relationships. Data was collected using surveys distributed to a total of 90 respondents, comprising 60 surveys for the first building, the Religious Department, and 30 surveys for the second building, Al-Qishla. Respondents' ages ranged from 18 to 50 years.

To record the extent of their psychological response to the design elements of the sample buildings, yes-or-no questions were used. The questions were as follows:

Questions with yes or no answers were used in order to know the extent of the residents' psychological response to the design elements, as they were asked (Is the relationship positive with the building (yes, no), is the building impressive (yes, no), does the building reflect the past (yes, no) No), has the building lost its personality nowadays (yes, no), do you understand the changes (yes, no))

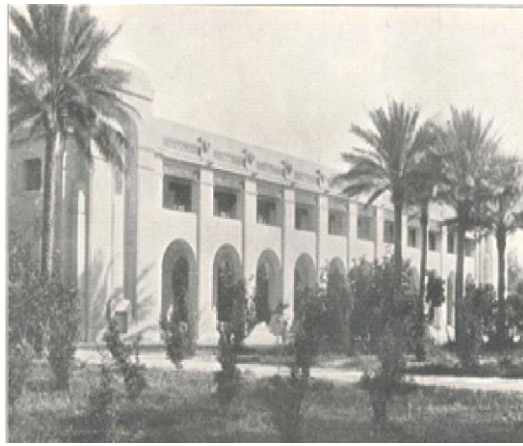
The questions about architectural characteristics and their evaluation were as follows:

(Is the building clear in terms of details and movement inside the building (yes no), do you feel safe in the building in terms of physical and psychological safety (yes no), does the building provide sufficient privacy for work or study (yes no) does the building have enough flexibility for activities (yes no)) and the correlation between the variables was calculated using Pearson's correlation coefficient. Furthermore, the impact of the design characteristics on the psychological relationship was calculated using a t-test in a stepwise multiple linear regression model to test the extent of its influence.

## 6. Case Study

Two buildings from the rich heritage of Iraq were used (Table 1) illustrating the architectural and aesthetic values of the religious department building, the functions of the building, and the renovation and maintenance processes that the building has undergone (Figure 1).

While Table (2) illustrates the architectural and aesthetic values of the Al-Qishla building, the functions of the building, and the renovation and maintenance processes that the building has undergone (Figure 2).



**Figure (1):** Al-Bayt University Religious Division Building

**Figure (2):** Al-Qashla Building

**Table (1):** The architectural and aesthetic values of the Al al-Bayt University building, the functions of the building, and the renovation and maintenance processes that the building has undergone.

<b>Al al-Bayt University Constructed in 1922</b>			
These values contribute to establishing the cultural, aesthetic, and unique identity of the building.	The cultural value lies in its symbolism as the beginning of modern education in Iraq and the desire to establish an educational institution resembling international universities. Additionally, the historical significance of the building's location and the choice of Al-Adhamiya as the site for building Al-Albayt University had an impact on people's lives in the community, making it a cultural value at the time. Furthermore, the continued use of the building despite the challenges it faced, as well as its persistence as an educational institution, contributed to the preservation of its cultural and historical value, enhancing the local heritage of the region.	Cultural Values	<b>Building Values</b>
	The precision in construction and the architectural details selected by G.M. Wilson made the Religious Affairs Department building an impressive architectural achievement. The building follows a classical European style, focusing on showcasing the aesthetic beauty of the structure, primarily by using brick as a finishing material. The side cornices, despite the weight of the building materials, are carefully constructed to create a sense of massiveness while playing with light and shadow. The consistent use of arches in door and window details adds an attractive design unity, and the building's windows are designed for weather protection.	Architectural Aesthetic Values	
Expresses its privacy as an educational institution, maintaining its historical significance.	The building was originally established as part of the Al-Bayt University with cultural and architectural significance. However, its purpose changed over the years, serving as the headquarters for the university's magazine, then as a temporary location for the parliamentary council. Later, it became a teacher's training center, and finally, in 2004, it was converted into the College of Education for Girls, affiliated with the University of Baghdad. Throughout its history, the building retained its original purpose, and its architectural details remained largely unchanged.		<b>Purposes of the building</b>
Renovations helped	Continuous maintenance and renovation efforts have preserved the building, with periodic maintenance activities, such as the replacement of flooring and the addition		<b>Renovations</b>



maintain the building and enhance its durability	of secondary ceilings and improved environmental systems in 2011. These measures improved the building's functionality, allowing it to accommodate an increased number of students while safeguarding its structural integrity.
--	---

**Table (2):** The architectural and aesthetic values of the Al-Qishla building, the functions of the building, and the renovation and maintenance processes that the building has undergone.

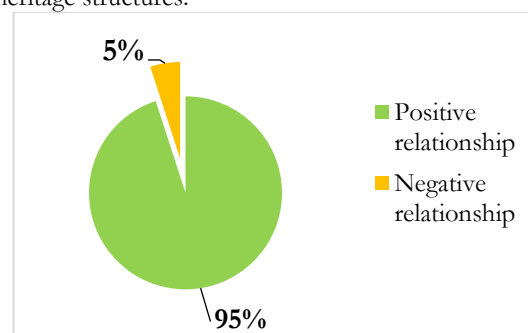
Al-Qishla building			
Constructed in 1851-1852			
These values operate to achieve the building's identity	The adaptive reuse process, with its cultural and social utilization, has preserved the building along with its historical and artistic value. It has also enhanced the local heritage and the cultural identity of the Baghdad community, as the building is rich with stories and memories.	Cultural Values	<b>Building Values</b>
	Throughout the building's lifespan, the aesthetic values have been preserved by maintaining heritage elements and details dating back to the Ottoman style, characterized by designs similar to those of castles. Despite the absence of official blueprints for the building, these details were meticulously restored, relying on the surrounding context.	Architectural Aesthetic Values	
This reflects the building's flexibility and its ability to accommodate various functions. Consequently, it becomes an attraction for providing employment opportunities for different segments of society.	The building served as military barracks for the Ottoman army. Then to accommodate British officer families. The Al-Qishla building has housed various government institutions, including the Council of Ministers, the Ministry of Interior, the Ministry of Education, the Ministry of Foreign Affairs, the Ministry of Justice, and the Post Office. In the 1980s, the building was evacuated and became a base for some authors, as well as financial and legal institutions. Afterward, it was utilised by museums and exhibitions and was eventually transformed into a cultural and tourist complex after 2013.		<b>Purposes of the building</b>
The preservation efforts have helped reinforce the architectural and aesthetic values while maintaining the building's style.	The preservation efforts involved adaptive reuse, rehabilitation, maintenance, and restoration. All incompatible additions due to the building's changing functions were removed. The interior and exterior spaces were reorganized, and mechanical, electrical, and plumbing services were added to enhance functionality while preserving the building's historical value. This demonstrates the building's adaptability to change, with a few walls being reconstructed using different materials.		<b>Renovations</b>

## 7. Results and Discussion

1. The survey results, conducted on 90 participants regarding the two heritage buildings, revealed a positive relationship (95%) in contrast to a negative one (5%) (Figure 3). To further characterise the psychological relationship, participants evaluated five key descriptors: admiration, amazement, connection with the past, alignment with their needs, and preservation of the building (Table 3). The results indicated high levels of amazement (87%), admiration (91%), strong representation of the past (100%), compatibility with their requirements (87%), and a positive attitude towards preserving the building (83%) (Figure 4).

Heritage buildings, whether they have undergone renovations or not. These findings indicate a significant and predominantly positive connection of occupants with the building, and the results remained consistent across various age groups, genders, and the nature of the services provided by the buildings. This suggests a natural and inherent positive relationship

that people often form with historical places. Therefore, the research underscores the importance of preserving these buildings and making efforts to adapt them in ways that cater to the occupants' needs while maintaining the positive bond between them and the heritage structures.

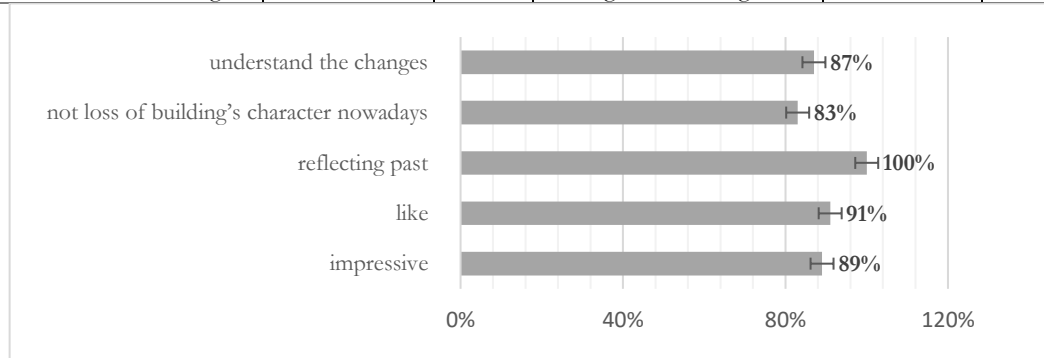


**Figure (3):** Percentage of positive relationship achieved in evaluating the relationship between the occupant and the building [Source: Authors]



**Table (3):** The arithmetic means and percentage of the research sample's answers regarding appreciation of heritage buildings [Source: Authors]

Appreciation					
Positive			Negative		
Evaluation of the heritage building	Repetition	%	Evaluation of the heritage building	Repetition	%
impressive	80	89%	Not impressive	10	11%
like	82	91%	dislike	8	9%
reflecting past	90	100%	not reflecting past	0	0%
not loss of building's character nowadays	75	83%	loss of building's character nowadays	15	17%
understand the changes	78	87%	regret the changes	12	13%



**Figure (4):** Percentage of achievements of heritage building assessment vocabulary [Source: Authors]

2. Table 4 shows the percentage of responses to questions regarding the architectural characteristics of the place, where 84% of the surveyed individuals answered "yes" that the building is clear in terms of details and movement inside the building, while 91% of them answered "yes" that the building is clear in terms of its function and the services provided within the building. Likewise, the same percentage (88%) answered "yes" that they feel safe in the building in terms of physical and psychological safety.

Approximately 79% of their responses were "yes" when asked if the building provides sufficient privacy for their work or study, while the lowest percentage of "yes" responses (73%) was related to whether the building has sufficient flexibility for their activities with their peers inside the building. Table (5) illustrates the percentages of responses regarding architectural details.

3. To test the extent of the influence of design characteristics on the psychological relationship, a simple linear regression model was used to determine the impact of the architectural characteristics of the place on the nature of the psychological relationship between the heritage building and its occupants, based on the following hypothesis:

H<sub>0</sub>: There is no statistically significant effect of the architectural characteristics of the heritage building on the psychological relationship of the occupants.

H<sub>1</sub>: There is a statistically significant effect of the architectural characteristics of the heritage building on the psychological relationship of the occupants.

**Analysis of Variance (ANOVA) Test:**

From Table (5), it is apparent that the F-test value equals (134.217), and the p-value equals (sig= 0.000), which is less than the assumed significance level (0.05). Therefore, we reject the null hypothesis and accept the alternative hypothesis (H<sub>1</sub>) which states that there is a statistically significant effect of the architectural

characteristics of the heritage building on the psychological relationship of the occupants. The determination coefficient value (R<sup>2</sup>=0.60) indicates that the variable (architectural characteristics of the heritage building) explains approximately 60% of the variation in the dependent variable (the psychological relationship of the occupants with the heritage building). The simple linear regression equation is as follows:

$$Y = 1.36 + 0.70X \dots (1)$$

Where:

Y represents the dependent variable (the psychological relationship of the occupants with the heritage building).

X represents the independent variable (architectural characteristics of the heritage building).

**8. Test (t-test)**

To test the indicators of the simple linear regression model, a t-test was used as follows:

From Table (6), it is evident that the t-test value for the variable (architectural characteristics of the heritage building) is 11.585 (t=), and the p-value for it equals (sig=0.000), which is lower than the assumed significance level (0.05). Therefore, we can conclude that this variable has an effect on the dependent variable, with a beta coefficient value (β = 0.70). This means that when the value of the variable X (architectural characteristics of the heritage building) changes by one unit, it will lead to an increase of 70% in the dependent variable (the psychological relationship of the occupants with the restored heritage building). From this, we can infer that there is a significant influence of the architectural characteristics of the heritage building on the psychological relationship of the occupants with the restored heritage building





**Table (4):** Numerical distribution and percentage of sample answers to the design characteristics paragraphs. [Source: Authors]

Design features of the place					
Properties	Repetition	%	Properties	Repetition	%
The function is clear	76	84%	The function is not clear	14	16%
The elements are clear	82	91%	The elements are not clear	8	9%
I feel safe in the building	79	88%	I don't feel safe in the building	11	12%
I feel Privacy	71	79%	I don't feel Privacy	19	11%
Flexible	66	73%	not flexible	24	17%

**Table (5):** Analysis of variance (ANOVA) to test the effect of the design characteristics of the heritage building on the psychological relationship of the occupants. [Source: Authors]

Source of variance	Sum of squares	Degrees of freedom	F	Probability value sig	Coefficient of Determination R <sup>2</sup>
Regression	7.080	1	134.217	0.000	0.60
the rest	4.642	88			
the total	11.722	89			

**Table (6):** T-test results for a simple linear regression model parameter. [Source: Authors]

Variable	Model parameters	Parameter value	Standard error Std. Error	value t	Significance level Sig
(Constant)	$\alpha$	1.36	0.2960	4.626	0.000*
Design features of the place	$\beta$	0.70	0.0610	11.585	0.000*

## 9. Conclusions:

The design characteristics of the heritage building have a significant impact on the psychological relationship of the occupants. a majority of respondents indicated that the design characteristics of the place, such as the function clarity, elements clarity, feeling of safety, privacy, and flexibility, were satisfactory. The majority of the research sample appreciates heritage buildings, with a high percentage expressing positive evaluations and an appreciation for the reflection of the past in these buildings. the variable "architectural characteristics of the heritage building" has a significant effect on the psychological relationship of the occupants with the restored heritage building.

## 10. Recommendations:

It is important for designers and architects to consider the heritage building's design characteristics carefully in order to enhance the psychological well-being of the occupants.

Future research should focus on identifying specific design elements that have the greatest impact on occupants' psychological relationship with the building.

It is important to continue preserving and promoting heritage buildings to maintain their character and historical significance. Efforts should be made to educate the public on the importance of cultural heritage and encourage a deeper appreciation for these buildings.

Further research could be conducted to explore the specific architectural characteristics that have the most significant impact on the psychological relationship of the occupants. This could provide valuable insights for the design and restoration of heritage buildings.

## 10. Reference

- [1] Sektani, H. H. J., Khayat, M., Mohammadi, M., & Roders, A. P. (2022). Factors Linking Perceptions of Built Heritage Conservation and Subjective Wellbeing. *Heritage & Society*, 16(1), 52–67. <https://doi.org/10.1080/2159032X.2022.2126225>
- [2] Rezaei, H., Keramati, G., Sharif, M. D. & Nasirsalami, M. (2018) " A Schematic Explanatory Pattern for the Psychological Process of Achieving Environmental Meaning and Actualizing Sense of Place Focusing on the Intervening Role of the Perception ", *Bagh-e-Nazar*, Vol.15 No. 65, pp.49-66.
- [3] Wells, J. C. (2020) " Probing the Person-Patina Relationship: A Correlational Study on the Psychology of Senescent Environments ", *Collabra: Psychology*, Vol, 6 NO.1.
- [4] Gantois, G. (2021)"Built Heritage as Imagines Agentes" , *Collabra: Psychology*, Vol.7 No.1.
- [5] Stedman, R. C. (2002) "Toward a Social Psychology of Place Predicting Behavior from Place-Based Cognitions, Attitude, and Identity", *Environment and Behavior*, Vol. 34, No. 5, pp.561-581.
- [6] Mina Najafi, Mustafa K. B. M. Shariff. (2011) "The Concept of Place and Sense of Place In Architectural Studies", *World Academy of Science, Engineering and Technology International Journal of Humanities and Social Sciences* Vol:5, No:8, 2011.
- [7] Ramkissoon, H., Smith, L. D. & Weiler, B. (2012) "Relationships between place attachment, place satisfaction, and pro-environmental behavior in an Australian national park", *Journal of Sustainable Tourism*, Vol. 21, No, (3), pp. 1-24.
- [8] Erfani, G. (2022) " Reconceptualising Sense of Place: Towards a Conceptual Framework for Investigating Individual-Community-Place



- Interrelationships ", *Journal of Planning Literature*, Sage Journals, Vol. 37 No. 3, pp. 452-466.
- [9] Ahmed, Z., & Al Ali, S. S. (2023). Psychological Relationships Between Heritage Buildings and their Occupants: A Theoretical Exploration.
- [10] Yazdani Mehr, S., & Wilkinson, S. (2020). The importance of place and authenticity in adaptive reuse of heritage buildings. *International Journal of Building Pathology and Adaptation*, 38(5), 689-701.
- [11] Hasan, H. S. M., Ab Wahab, L., & Ismail, D. (2017). A Review of Authenticity in Adaptive Reuse of Heritage Buildings in Malaysia. Perak: Universiti Teknologi MARA.
- [12] Alho, C., Morais, A., Mendes, J., & Galvao, A. (2010). Authenticity criteria in the conservation of historic buildings. In *Cib 2010 World Conference, Building a Better World* (pp. 188-198).
- [13] Ehteshami, A., & Soltaninejad, M. (2020). The Concept of Authenticity in Restoration Analysis of Monitoring and Restoration in the Authenticity Preservation of Cultural Heritage. *Advances in Anthropology*, 10(2), 81-96
- [14] Osmanlılar, C. (2012) " Reflectance of change within space and the state of human sensation through adaptive re-use of old spaces", Doctoral dissertation, Eastern Mediterranean University (EMU)-Doğu Akdeniz Üniversitesi (DAÜ).
- [15] Cheuk, F. N. (2020) " Perception and Evaluation of Buildings: The Effects of Style and Frequency of Exposure ", *Collabra: Psychology*, Vol. 6 No. 1, pp.1-10.
- [16] Sektani, H. H., J., Khayat M., Mohammadi, M. & Roders, A. P.(2021) "Erbil City Built Heritage and Wellbeing: An Assessment of Local Perceptions Using the Semantic Differential Scale ", *Sustainability*, Vol. 13, No. 7, 3763.
- [17] Chai, Q., Li, H., Tian, W., Zhang, Y. & Wang, L. (2022)"A Framework for Assessing the Performance of Adaptively Reused Buildings from Users' Perspective: A Case Study of School Building", *Advances in Civil Engineering*.
- [18] Taher Tolou Del, M. S., Saleh Sedghpour, B., & Kamali Tabrizi, S. (2020). The semantic conservation of architectural heritage: the missing values. *Heritage Science*, 8, 1-13.
- [19] Rosado Correia, M. R. A., & Walliman, N. S. R. (2014). Defining criteria for intervention in earthen-built heritage conservation. *International Journal of Architectural Heritage*, 8(4), 581-601.
- [20] Feilden, B. M., & Jokilehto, J. (1998). Management guidelines for world cultural heritage sites. (No Title).
- [21] Avrami, E., Mason, R., & De la Torre, M. (2000). *Values and Heritage Conservation* (Los Angeles: Getty Conservation Institute).
- [22] Worboys, G. L., Lockwood, M., Kothari, A., Feary, S., & Pulsford, I. (Eds.). (2015). *Protected area governance and management*. Anu Press.
- [23] Feilden, B.M. (1994). *Conservation of Historic Buildings*. USA: Elsevier Science & Technology Books.
- [24] Hussein, Z. A. & Al Ali, S. S. (2021)"The role of augmented reality in revitalizing the tourist space of the built heritage via perception", *Periodicals of Engineering and Natural Sciences*, Vol. 10 No. 1, pp. 47-58.
- [25] Hussein,F.A.M., "Design criteria for Adaptive reuse of heritage buildings to achieveThe principle of sustainability(Al Ghouri Group CaseStudy)",webservice [https://www.researchgate.net/publication/342520926\\_almayyr\\_altsmymyt\\_laadt\\_twzyf\\_almban\\_y\\_alrathyt\\_lthqyq\\_mdba\\_alastdamt\\_drast\\_halt\\_mjmw\\_t\\_alghwry](https://www.researchgate.net/publication/342520926_almayyr_altsmymyt_laadt_twzyf_almban_y_alrathyt_lthqyq_mdba_alastdamt_drast_halt_mjmw_t_alghwry) [accessed1/12/2024]
- [26] Abdul Rahman,A.T.O., (2014) "Rehabilitation and Re-use of Heritage Buildings" DOI: 10.21608/MJAF.2023.246800.3250
- [27] Doshi,S. & Devi,T.S. (2023), "Adaptive Reuse of Historic Buildings"International Journal For Multidisciplinary Research , Volume 5, Issue 3, May-June 2023
- [28] Al horr, Y., Arif, M., Kafaygiotou, M., Mazroei, A., Kaushik, A. & Elsarrag, E. (2016) " Impact of indoor environmental quality on occupant well-being and comfort: A review of the literature", *International Journal of Sustainable Built Environment*, Vol.5, No.1, pp. 1-11.
- [29] Hamdy, M. H. T. (2017) " Interior Architectural Elements that Affect Human Psychology and Behavior". *Cities' Identity Through Architecture and Arts (CITAA)*, The Academic Research Community Publication, Vol.1 No. 1.
- [30] Issa, F. T. (2022) " Sense of Place Adaptive Reuse Act in Interior Architecture and Design ", A Thesis Submitted to the College of Engineering University of Baghdad.
- [31] Lee, T. K., Cho, S. H. & Kim, J. T. (2012) "Residents' Adjusting Behavior to Enhance Indoor Environmental Comfort in Apartments", *Indoor and Built Environment*, Vol. 21 No. 1, pp 28-40.
- [32] Olaya, H. D. S. (2018)" El aprendizaje de la percepción del espacio arquitectónico, Una aproximación a su comprensión desde la experiencia en el taller de diseño uno", Doctoral dissertation, Universidad Nacional de Colombia.
- [33] Skaza, M. (2019) " Architecture as a Consequence of Perception", In *IOP Conference Series: Materials Science and Engineering*, IOP Publishing, Vol. 471, No 2, pp. 022033.
- [34] Lynch, K. (1971)"Site Planning", Second Edition, USA: MIT Press.
- [35] Aldalal, F. M. A. A., Inayat M. & Ismail, M. (2016)"The Psychological Language of Perceptive Design within Spatial Space", *Human and Social Sciences*, Volume 43 No. 2.
- [36] Saleh, Q. H. (1982)" The psychology of color and shape perception", *Publications of the Ministry of Culture and Information*, Series No. 305, Dar Al-Rasheed Publishing House, Baghdad.
- [37] Mehrabian, A., & Russell, J. A. (1974). *An approach to environmental psychology*. the MIT Press.
- [38] Stokols, D., (1992), "Establishing and Maintaining Healthy Environments Toward a



- Social Ecology of Health Promotion”*American Psychologist*, 47(1)
- [39] Adiwibowo, R. S., Widodo, P., & Santosa, I. (2015). Correlations between public appreciation of historical buildings and intention to visit heritage buildings reused as retail stores. *Procedia-Social and Behavioral Sciences*, 184, 357-364.( Adiwibowo, R. S., et al. ,2015).
- [40] Yuksel, A. (2007). Tourist Shopping Habitat: Effects on Emotions, Shopping Value and Behaviours. *Tourism Management* 2007, 28, 58–69.