

Nostalgia in Architecture: Developing a Multidimensional Model to Measure the Perceptual-Emotional Response to Place

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Abstract

Contemporary architecture, shaped by rapid transformations and globalization, has often produced built environments characterized by abstraction and neutrality, lacking cultural depth and emotional engagement. In this context, architectural nostalgia emerges as a key concept reflecting the relationship between people and place through memory, identity, and lived experience. Despite its theoretical richness, it remains insufficiently explored as a measurable construct.

This research aims to redefine architectural nostalgia as a quantifiable, multidimensional phenomenon by developing an analytical model integrating four main dimensions: formal-referential, material-sensory, symbolic-cultural, and perceptual-emotional. A questionnaire based on a five-point Likert scale was administered to a sample of 60 participants to evaluate two contrasting architectural cases.

The results revealed clear differences between the two cases. The first case achieved high values across all dimensions, while the second recorded low values. A paired samples t-test confirmed a highly significant difference between the two cases, $t(57) = 17.44$, $p < 0.001$. Pearson correlation analysis showed that architectural nostalgia was strongly associated with the perceptual-emotional dimension ($r = 0.88$), followed by the symbolic-cultural dimension ($r = 0.78$) and the material-sensory dimension ($r = 0.65$), while its relationship with the formal-referential dimension was weak ($r = 0.23$). Regression analysis indicated that the model explains approximately 80% of the variance in architectural nostalgia ($R^2 = 0.80$), with the perceptual-emotional dimension emerging as the most influential factor.

Keywords. Architectural Nostalgia – Place Attachment – Perceptual Experience – Cultural Identity – Built Environment – Quantitative Model

1. Introduction

Contemporary architecture has witnessed rapid transformations due to technological progress and globalization, which has led to the production of built environments that are often characterized by abstraction and neutrality, and lack cultural depth and emotional connection with the user, which is what Edward Relph referred to in his introduction of the concept of placelessness, which reflects the loss of spatial identity in contemporary environments. [1] Amid these transformations, the need arose to reconsider the relationship between humans and place, not only from a functional or formal perspective, but also by exploring the cognitive and emotional dimensions that contribute to shaping the architectural experience.

Yi-Fu Tuan emphasizes that place is perceived as a lived experience linked to sensation and memory. In this context, the concept of nostalgia is a fundamental one, reflecting humanity's connection to the past and its evocation of individual and collective memory through place[2].

Architectural literature has addressed the concept of nostalgia as a phenomenon linked to memory, identity, and belonging. It refers to the ability of architectural spaces to evoke past experiences or cultural symbols rooted in the collective consciousness, thus reinforcing a sense of familiarity and continuity. This intersects with Christian Norberg-Schulz's concept of "spirit of place" (Genius Loci). However, most of these approaches have remained within a descriptive or interpretive framework, with limitations in transforming this concept into a methodological framework that can be measured and quantitatively analyzed. This limits the possibility of comparing it or employing it as a design or evaluative tool in architecture[3].

Accordingly, this research seeks to redefine nostalgia in architecture as a measurable cognitive-emotional phenomenon by developing a multidimensional model aimed at measuring cognitive and emotional responses to place. This model is based on integrating concepts derived from architectural theory and phenomenology, established by Martin Heidegger in understanding the relationship between humans and place, with the goal of transforming nostalgia from an abstract concept into a practical analytical tool[4].

Therefore, this research raises a key issue: the absence of a clear methodological framework for measuring nostalgia in architecture, and the resulting difficulty in assessing its role in shaping the architectural experience. Hence, the importance of this research lies in its contribution to a scientific field: the development of a quantitative index for measuring architectural nostalgia. This will help bridge the gap between theory and practice, and open new horizons for understanding the relationship between memory and place in contemporary architecture.

2. Nostalgia in Previous Studies

Nostalgia is a complex concept that has transcended its traditional meaning as merely an emotional longing for the past. In contemporary literature, it is understood as a psychological and social experience that contributes to strengthening social cohesion, self-continuity, meaning in life, and psychological well-being. Recent studies in psychology indicate that nostalgia represents a positive cognitive-emotional mechanism that enhances the sense of belonging and supports individual identity.[5,6]

Recent research has also shown that nostalgic feelings are associated with a higher sense of meaning in life and can influence spatial behavior, including the desire to return to or reproduce certain places.[7]

In the architectural context, nostalgia gains its importance from the fact that it does not arise in a vacuum, but rather is generated from the interaction between people and place. Here it intersects with fundamental concepts such as attachment to place, memory of place, and sensory perception of space. John Eyles developed the concept of attachment to place as an emotional and cognitive relationship with the built environment [8] Pierre Nora addressed the concept of "memory spaces" that store and reproduce collective meanings over time [9]. Juhani Pallasmaa also points out that the perception of architectural space is shaped through the senses, and that sensory memory plays an essential role in constructing the architectural experience and recalling the emotions associated with it[10].

From this perspective, architectural nostalgia can be seen as a result of spatial characteristics capable of resisting placelessness and evoking past experiences rooted in individual or collective memory. Y.-F. Tuan linked the emotional experience of place to concepts such as familiarity, affection, and emotional attachment to place in his work on *Topophilia* and *Space and Place*, providing an important theoretical foundation for understanding how the built environment becomes an emotional, rather than merely functional, object.[2]

The concept of place attachment has been developed as an emotional and conceptual bond between humans and their environment. Reviews in this field indicate that place attachment encompasses personal, social, and material dimensions, and that it is not limited to residence or use, but extends to a sense of belonging, identity, and continuity. Scannell and Gifford demonstrated that this attachment provides a suitable interpretive framework for understanding human connections to place.[11]

Maria Lewicka explained in her work that the memory of place and spatial identity are closely linked to the evocation of the urban past and the construction of the collective meaning of the city.[12]. Thus,

architectural nostalgia becomes a unique emotional manifestation of attachment to place, where memory is activated through space. A place evokes nostalgia not merely because it is "old," but because it contains material, symbolic, and sensory markers that allow for the recall of what is familiar, shared, and meaningful. Therefore, nostalgia is not simply linked to the past as a bygone era, but to the past as a lived experience, re-evoked through space. This understanding aligns with Boym's approach, who presented nostalgia as a complex relationship between longing and belonging, not merely a naive desire to retrieve the past [13].

On a sensory architectural level, Johanni Balasma's contribution is particularly significant. In "The Eyes of the Skin", he emphasizes that the experience of architecture is not reducible to sight alone, but is shaped through a multisensory approach, and that true architectural perception is embodied and tangible. Peter Zumthor, in "Atmospheres", also points out that architectural impact arises from an "intensity," "mood," and "presence" inseparable from materials, light, sound, and proportion.[14] . This perspective is crucial to your research because it allows you to connect nostalgia with observable sensory elements such as texture, light, shadow, material density, spatial resonance, and visual familiarity. [10]

Based on this, a measurement model can be constructed using indicators such as formal familiarity, memory density, symbolic power, sensory presence, and spatial belonging. This shift from description to measurement represents a gap that architectural literature still needs to bridge, despite significant progress in the psychological and social studies of place and nostalgia.

Based on the foregoing, it is clear that architectural nostalgia is not a marginal or impressionistic concept, but rather a complex phenomenon situated at the intersection of memory, identity, attachment to place, and sensory perception. The literature demonstrates that these dimensions possess a solid theoretical foundation in human geography, environmental psychology, architectural phenomenology, and atmospheric studies. However, the challenge remains the absence of an integrated architectural model that transforms these perspectives into a measurable analytical tool. Hence, the importance of the current research lies in developing a multidimensional framework for quantifying architectural nostalgia and linking the emotional impact of place to its material, symbolic, and perceptual characteristics.

2.1 Reasons for Nostalgia

Nostalgia is a complex phenomenon, one of whose most significant manifestations is the perception of what might be termed "the poverty of the present"—a feeling of inadequacy or lack of fulfillment in lived reality compared to idealized mental images of the past. From this perspective, nostalgia is not simply an emotional recollection of the past, but rather an evaluative mechanism based on an implicit comparison between two eras, through which the past is reframed as complete and more positive [15]. Many theoretical approaches suggest that nostalgia involves an implicit value judgment that assumes the superiority of the past over the present, with the past being reproduced as a normative reference point for comparison. Within this framework, the "poverty of the present" is seen not only as a cause but also as a cognitive condition that activates the invocation of the past as a symbolic or compensatory substitute. Robert C. Roberts, for example, argues that nostalgia involves an unfavorable comparison that makes the present seem painful or less satisfying.[16]

Malcolm Chase and Christopher Shaw also assert that this pattern of feeling requires an implicit awareness that the present suffers from a structural deficiency or inadequacy.[17]

In the same vein, it is worth noting that nostalgia is based on the belief that "things were better in the past compared to the present," which reflects its evaluative rather than merely retrospective dimension (Davis). Linda Hutcheon pointed out that nostalgia reconstructs the past as an ideal space (simple, organized, harmonious), in contrast to a present portrayed as complex and chaotic, thus reinforcing the feeling that the past was more stable, cohesive, and secure [18].

Therefore, nostalgia can be understood in two basic forms: typical and atypical. Typical nostalgia often evokes positive feelings, connects individuals to cherished memories, and reinforces their sense of identity and continuity. It serves as a bridge to the past, helping individuals navigate current challenges by recalling core values and meaningful experiences. In contrast, atypical nostalgia tends to have a more negative

emotional impact and can lead to feelings of loss and displacement, as it reflects on unfulfilled potential or an idealized past, creating a sense of alienation. This form of nostalgia can complicate identity formation by fostering a disconnect from the present and a yearning for an imaginary life that never came to be. [20]

2.2 Nostalgia and Place Identity

Christian Norberg-Schulz presents the concept of identity as an expression of a deep relationship and psychological harmony between the individual and their spatial environment. This harmony is embodied in the individual's feeling of familiarity and belonging to the place, and in their ability to interact with its physical and symbolic characteristics as an extension of their existence. From this perspective, belonging to a place is one of the fundamental pillars in interpreting the nature of the relationship between the individual and the built environment.[3]

In this context, place identity represents a symbolic dimension reflecting an existential presence rooted in a specific location, and it plays a pivotal role in shaping human perception and mental representations of place. This identity is not formed in isolation from context, but rather is influenced by a range of interconnected factors, including narratives associated with the place, collective and individual memory, history, as well as material characteristics and social and cultural elements, which combine to form a distinct spatial character with specific connotations.[21]

Furthermore, connection to a place contributes to fulfilling a range of basic psychological needs, such as a sense of meaning, enhanced self-esteem, and a firmer sense of belonging. Therefore, the relationship between memory and place identity is closely linked to the aesthetic and historical value of sites, particularly in heritage settings, where this relationship contributes to a place's uniqueness and distinction. This unique character also allows the place to acquire a growing competitive advantage, reinforced by the enduring values inherited from the past, whose importance extends beyond the historical dimension to form the foundation of its future role. Within this framework, architectural identity is manifested through a system of formal characteristics and physical symbols that express essential meanings and accumulated cultural values.[22]. Brenner and Schulz assert that architectural space can be understood as a representation of human existential space, that is, the space in which humankind's relationship with the world is embodied. [23]

On the other hand, David Canter presented an analytical framework for interpreting the identity of place, identifying three main components for its diagnosis: actions, perceptions, and physical attributes. He emphasizes that a comprehensive understanding of place is only achieved through recognizing the nature of the interactive relationships between these three dimensions.[24]

It is essential to view architecture as an active tool in shaping the cultural identity of societies, as this identity manifests and transforms across time and space within changing historical and social contexts. In light of contemporary transformations, globalization has had a significant impact on reshaping this identity, contributing to the weakening of local particularities and creating a kind of cultural fragmentation. From this perspective, the need arises to redefine architectural practices within a conscious and critical framework that aims to preserve cultural identity and enhance its continuity in the face of global pressures [25], as illustrated in Figure (1).

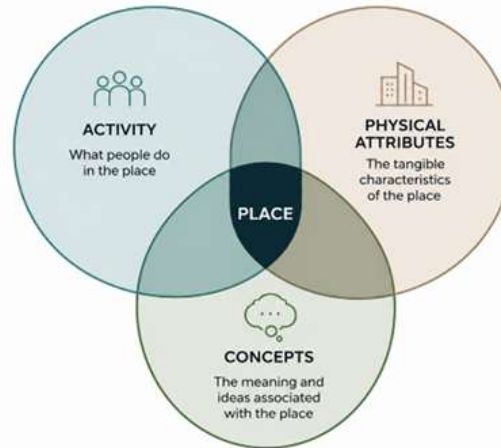


Figure (1) Identity Definition Elements [24]

The identity of a place is not built solely on physical aspects, but is rooted in human experience and the psychological and symbolic bonds between people and place. It is the product of accumulated memories, social experiences, and cultural values that characterize a place and give it its uniqueness. Therefore, understanding the identity of a place requires a multidimensional approach that encompasses actions, perceptions, and physical attributes. This approach strengthens belonging and collective memory.

3. Research Gap

Despite the remarkable accumulation of knowledge in studies of nostalgia within the fields of social psychology and environmental psychology, which confirmed its role in promoting a sense of identity, continuity and psychological well-being, as well as the development of the concept of place attachment as an interpretive framework for understanding the emotional relationship between man and his built environment, the use of these concepts within the field of architecture is still limited in its quantitative applied aspect. While architectural literature, particularly phenomenological literature, has focused on concepts such as Genius Loci (spirit of place) and architectural atmospheres, and emphasized the sensory and perceptual dimensions of spatial experience, it has largely remained within an interpretive and qualitative framework, without developing methodological tools that allow for the scientific measurement or comparison of these phenomena. Furthermore, studies addressing spatial memory and urban nostalgia have not aimed to construct an integrated architectural model that links the formal and material characteristics of space, symbolic and cultural dimensions, and the perceptual-emotional responses of the user within a quantitative and applicable framework. Therefore, the research gap can be identified as the absence of a multidimensional architectural model that integrates spatial memory, attachment to place, sensory perception, and cultural symbolism, with the goal of measuring architectural nostalgia and transforming it from a qualitative concept into a measurable and quantifiable variable.

4. Operational Definition

Based on the previous literature, architectural nostalgia can be operationally defined as follows:

Architectural nostalgia is a cognitive-emotional response that arises from the user's interaction with spatial, material, and symbolic characteristics in the architectural space. It contributes to the evocation of individual or collective memory, and enhances the sense of familiarity, belonging, and continuity. It can be measured through a set of quantitative indicators related to the formal, sensory, symbolic, and perceptual dimensions of the place. This definition is based on:

- The concept of nostalgia as a mechanism for promoting self-continuity, according to Sedikides' theories [5]
- The concept of place attachment as an emotional-cognitive relationship, according to Scannell L & Gifford [11]
- The phenomenological approach to architecture as an embodied sensory experience, as Pallasmaa pointed out. [10]

5. Research indicators

Based on the theoretical framework, a multi-dimensional model for measuring architectural nostalgia can be constructed, consisting of four main dimensions, each with a set of measurable indicators:

5.1 The Formal-Referential Dimension

This relates to the ability of an architectural composition to evoke familiar or traditional patterns. It includes:

- Degree of formal familiarity
- Continuity of architectural patterns
- Clarity of historical reference
- Harmony with the urban context

5.2 Material-Sensory Dimension

This dimension relates to the role of materials and sensory properties in evoking emotional responses .It includes:

- Texture (roughness/smoothness)
- Thermal perception of materials
- Light and shadow quality
- Acoustic effect/echo [10]

5.3 The Symbolic-Cultural Dimension

This dimension relates to the symbolic meanings of architectural elements and their connection to identity . It includes:

- The strength of architectural symbolism
- The clarity of cultural connotations
- The connection of elements to collective memory
- The expression of local identity [3,13]

5.4 Perceptual-Emotional Dimension

This represents the user's direct response to the space. It includes:

- Familiarity
- Recalling memories
- Sense of belonging
- Psychological comfort [26,12]

Based on the foregoing, architectural nostalgia can be considered a complex, multidimensional variable, formed from the interaction of the formal, material, and symbolic properties of space with the user's sensory perception and emotional response. Transforming this variable into quantitative indicators is a crucial step towards developing an analytical model capable of measuring and comparing it, thus bridging the gap between theoretical discourse and systematic application in architectural studies. Figure (2) shows a diagram of the theoretical framework indicators.

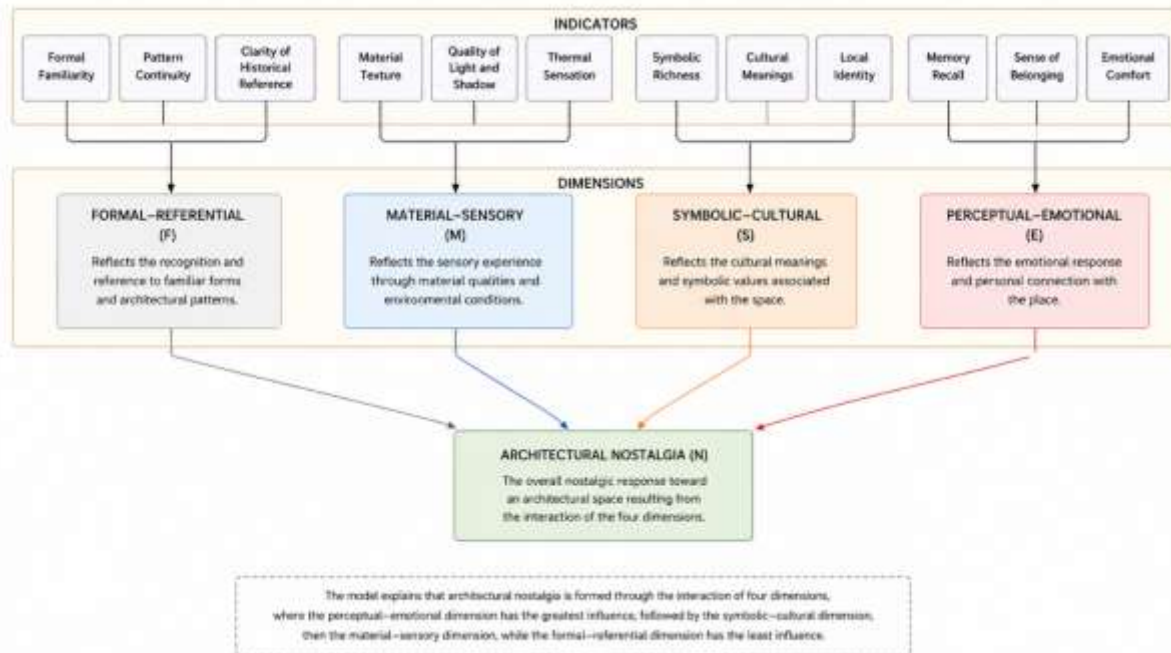


Figure (2) shows a diagram of the theoretical framework indicators. (author)

6. Research Methodology

This research employs a mixed-methods approach, combining qualitative and quantitative analysis to achieve a comprehensive understanding of architectural nostalgia as a multidimensional cognitive-emotional phenomenon.

This approach is based on the necessity of combining:

- Theoretical interpretation of the concept (through a phenomenological and cognitive framework)
- Quantitative measurement of the user's emotional response

6.1 Research Design

The research employs an analytical design based on building a multi-dimensional model to measure architectural nostalgia. This model comprises four main dimensions:

1. Formal-Referential Dimension
2. Material-Sensory Dimension
3. Symbolic-Cultural Dimension
4. Perceptual-Emotional Dimension. This model will be tested by converting these dimensions into measurable quantitative indicators.

6.2 Research Instrument

A questionnaire was developed as the primary data collection tool, based on indicators derived from the theoretical framework. The questionnaire was administered to 60 participants.

The questionnaire comprises four main sections, representing dimensions of architectural nostalgia. Each section includes a set of evaluative statements that measure participants' responses to architectural space.

6.3 Validity and Reliability of the Measurement Instrument

To ensure the reliability of the measurement instrument, Cronbach's Alpha coefficient was calculated for each dimension of the questionnaire as well as for the overall scale. The results indicated a high level of internal consistency across all dimensions in both case studies.

In Case 1, Cronbach's Alpha values ranged between 0.77 and 0.94, while the overall scale reached 0.96. Similarly, in Case 2, the values ranged between 0.76 and 0.92, with an overall reliability coefficient of 0.95. These values exceed the acceptable threshold of 0.70, confirming that the questionnaire demonstrates strong reliability and consistency in measuring architectural nostalgia across its multidimensional structure.

The validity of the instrument was established through content and construct validity. Content validity was ensured by deriving the questionnaire items from a well-established theoretical framework grounded in architectural phenomenology and environmental psychology. Construct validity was supported by the statistical relationships observed between variables, where the correlation and regression analyses showed logical and theoretically consistent patterns among the dimensions of architectural nostalgia, as shown in table (1) the Cronbach's Alpha values indicate.

Table (1): Cronbach's Alpha Values for the Measurement Dimensions

Dimension	Case 1	Case 2
Formal–Referential (F)	0.77	0.76
Material–Sensory (M)	0.94	0.89
Symbolic–Cultural (S)	0.92	0.85
Perceptual–Emotional (E)	0.90	0.92
Nostalgia Index (N)	0.91	0.91
Overall Scale	0.96	0.95

6.4 Measurement Scale

The 5-Point Likert Scale was adopted as follows:

- 1 =Strongly Disagree
- 2 =Disagree
- 3 =Neutral
- 4 =Agree
- 5 =Strongly Agree

6.5 The Research Population and Sample

The research population consists of professionals in architecture (including academics and practitioners), urban designers, as well as users of architectural spaces. The sample included architecture academics, professionals, and users with prior spatial experience to ensure informed evaluation. This selection was intended to provide reliable and conscious assessments based on both expert knowledge and direct experiential perception of architectural environments.

7. Practical Aspect and Quantitative Analysis

7.1 Introduction to the Practical Aspect

This part of the research aims to test the proposed theoretical model of architectural nostalgia by transforming its conceptual dimensions into measurable quantitative variables subject to statistical analysis. Data collected from a questionnaire administered to (60) participants was used to evaluate two contrasting architectural cases: Al- Mustansiriya School and Mansour Mall, in terms of their formal, material, symbolic, and perceptual characteristics.

7.2 Variable Coding

The study variables were coded as follows:

- F = Formal-Referential Dimension
- M = Material-Sensory Dimension
- S = Symbolic-Cultural Dimension
- E = Cognitive-Emotional Dimension
- N = General Architectural Nostalgia

Each dimension was calculated by means of its corresponding items as follows:

- F = Mean of items(6–1)
- M = Mean of items(12–7)
- S = Mean of items(18–13)
- E = Mean of items(24–19)
- N = Mean of items(30–25)

7.3 Data Analysis Methods

The data were analyzed using a combination of descriptive and inferential statistical methods via Microsoft Excel, as follows:

- Descriptive Statistics: Arithmetic Mean and Standard Deviation
- Paired Samples T-test: To compare the two cases
- Pearson Correlation Coefficient: To study the relationships between variables
- Multiple Linear Regression Analysis: To determine the extent to which dimensions influence architectural nostalgia

8. Case Study 1: Al-Mustansiriya School

The Mustansiriya School is one of the most prominent historical architectural landmarks in Baghdad. Dating back to the Abbasid era, it was built in the 13th century CE (1227 CE) by Caliph al-Mustansir Billah. The school represents an advanced model of Islamic educational architecture, combining educational function with symbolic and cultural dimensions within an integrated architectural framework. The Mustansiriya School is distinguished by its spatial organization, centered around a central courtyard surrounded by arcades and rooms. This pattern reflects a continuity in Islamic architectural traditions while simultaneously enhancing the sense of enclosure and privacy. Its construction relies on brick (clay brick) as both a structural and expressive material, evident in the decorated walls and arches, reflecting the authenticity of the material and the clarity of the structural system. On a symbolic level, the Mustansiriya School embodies the cultural and scientific identity of the Abbasid era. As a center of learning encompassing various sciences, it possesses a significant significance that transcends its function and resonates within the collective memory. Furthermore, geometric and calligraphic decorative elements contribute to enhancing this symbolic dimension and connecting the place to its cultural context. Within this research, the Mustansiriya School was chosen as a case study representing heritage architecture with a clear historical reference, due to its formal, material, and symbolic characteristics that may— theoretically—contribute to strengthening the cognitive-emotional connection to the place. Therefore, this case is presented as a model that may possess the capacity to generate architectural nostalgia. However, the verification of this hypothesis will be achieved through the results of quantitative and survey analysis in the practical aspect, without presupposing the nature of the response figure (3). [27]



Figure (3) Al-Mustansiriya School in Baghdad (author)

8.1 Practical application for the first case study

The results of the descriptive analysis showed a clear increase in the arithmetic means for all dimensions of architectural nostalgia, with values ranging from 3.77 to 4.50, and a relatively low standard deviation of 0.68 to 1.09, indicating a high degree of homogeneity in the participants' responses. At the dimension level, the formal-referential dimension recorded the highest values, followed by the symbolic-cultural dimension, then the material-sensory dimension, while the cognitive-emotional dimension fell within the medium to high range. The results also showed that overall architectural nostalgia falls within the high category. The nostalgia score was distributed as follows:

- Formal-Reference Dimension: High (≈ 4.5) → Clear Historical Reference
- Material-Sensory Dimension: High ($\approx 4.17 - 4.37$) → Powerful Physical Presence
- Symbolic-Cultural Dimension: High ($\approx 4.24 - 4.44$) → Clear Cultural Identity
- Cognitive-Emotional Dimension: Medium to High ($4.22 - 3.94 \approx$)
- Overall Architectural Nostalgia: High ($4.15 - 3.82 \approx$)

8.1.1 Interpretation

This case represents an integrated architectural model that has a high capacity to generate architectural nostalgia as a result of the integration of its formal, sensory, symbolic and perceptual dimensions.

9. Case Study 2: Al Mansour Mall

Al Mansour Mall is one of the most prominent contemporary commercial projects in Baghdad, representing a model of modern consumer architecture associated with shopping and entertainment culture. It was designed according to international standards that emphasize open spaces, glass facades, and a functional organization based on movement and fluidity.

Al Mansour Mall is characterized by a modern architectural style that utilizes industrial materials such as glass and metal, with a strong presence of technological systems and industrial lighting, reflecting a trend

toward globalization and abstraction in design. However, this architectural style often lacks local specificity or historical reference, as these spaces are similar in various cities, which intersects with the concept of "placelessness" mentioned earlier. On a cognitive-emotional level, this type of space focuses more on function and consumption than on building an emotional or symbolic relationship with the user, thus limiting its ability to evoke memories or generate a sense of belonging. Furthermore, the uniformity and repetition of these spaces diminish their spatial distinctiveness. Accordingly, Al Mansour Mall is presented as a case study representing contemporary commercial architecture, characterized by formal, material, and functional features that differ from traditional models in terms of spatial organization, material quality, and the nature of architectural symbolism. Therefore, this case is presented within an analytical framework aimed at examining user responses to it, using quantitative indicators adopted in the study, without presupposing any inherent architectural nostalgia associated with it figure (4).[28]



Figure (4) Al Mansour Mall in Baghdad [29]

9.1 Practical application for the second case study

The results showed a significant decrease in the mean scores, ranging from 1.55 to 3.05, with a relatively high standard deviation (0.69 to 1.37), indicating a variation in participants' responses.

At the dimensional level, the symbolic-cultural dimension recorded the lowest values, followed by the cognitive-emotional dimension and then the physical-sensory dimension, while the formal-referential dimension fell within the low to medium range. The results also showed that overall architectural nostalgia fell within the low to medium category.

- Formal-Referential Dimension: Low to Medium ($\approx 1.55 - 3.05$) → Weakness in the clarity of historical reference
- Material-Sensory Dimension: Weak ($\approx 2.00 - 2.13$) → Limited material presence and low sensory impact
- Symbolic-Cultural Dimension: Very Weak ($\approx 1.55 - 1.93$) → Clear absence of cultural and symbolic connotations
- Cognitive-Emotional Dimension: Weak ($\approx 1.79 - 2.36$) → Limited emotional connection to the place
- Overall Architectural Nostalgia: Low to Medium ($\approx 1.65 - 2.58$) → Weakness in evoking feelings of nostalgia

9.1.1 Interpretation

This condition reflects a weakness in historical and symbolic reference, leading to a weak emotional response and a lack of nostalgia.

10. Paired Samples T-Test

To examine whether there was a statistically significant difference between the two architectural cases, a paired samples t-test was conducted using the overall architectural nostalgia scores obtained from the same participants for both cases. This test was considered appropriate since the same respondents evaluated both architectural environments, allowing for a direct comparison of their perceptual-emotional responses.

The results revealed a statistically significant difference between the two cases. The mean score for Al-Mustansiriya School was higher ($M = 4.17$, $SD = 0.62$) compared to Al-Mansour Mall ($M = 2.02$, $SD = 0.66$). The paired samples t-test confirmed that this difference was highly significant:

$t(57) = 17.44$, $p < 0.001$

This indicates that the difference in architectural nostalgia between the two cases is not due to random variation but reflects a substantial and systematic variation in users' responses.

10.1 Interpretation

These results demonstrate that the architectural characteristics of the two cases produced significantly different levels of nostalgic response. The Mustansiriya School exhibited a high capacity to generate architectural nostalgia, which can be attributed to the integration of symbolic-cultural, material-sensory, and perceptual-emotional dimensions within its spatial configuration. In contrast, Al-Mansour Mall showed a weaker nostalgic response, likely due to its limited symbolic depth, absence of historical reference, and reduced connection to collective memory.

10.2 Correlation Analysis

To explore the relationships between the dimensions of architectural nostalgia, Pearson's correlation coefficient was calculated between each dimension and the overall nostalgia index.

The results revealed varying degrees of association between the independent dimensions and the overall architectural nostalgia variable. The perceptual-emotional dimension exhibited the strongest correlation ($r = 0.88$), followed by the symbolic-cultural dimension ($r = 0.78$), and the material-sensory dimension ($r = 0.65$), all of which were statistically significant. In contrast, the formal-referential dimension showed a weak and non-significant correlation ($r = 0.23$).

10.2.1 Interpretation:

These findings indicate that architectural nostalgia is primarily driven by perceptual-emotional engagement, supported by symbolic-cultural meaning and sensory experience. The weak contribution of the formal-referential dimension suggests that the replication of traditional forms alone is insufficient to generate nostalgia, unless accompanied by deeper experiential and symbolic qualities.

10.3 Regression Analysis

To determine the extent to which the four dimensions contribute to the prediction of architectural nostalgia, a multiple linear regression analysis was conducted.

The results showed that the combined model explains a substantial proportion of the variance in architectural nostalgia, with a coefficient of determination of:

$R^2 = 0.80$

This indicates that 80% of the variation in architectural nostalgia can be explained by the four independent dimensions included in the model.

10.3.1 Interpretation:

The high explanatory power of the regression model confirms the validity of the proposed multidimensional framework. Among the dimensions, the perceptual-emotional dimension emerged as the most influential predictor, followed by the symbolic-cultural and material-sensory dimensions, while the formal-referential dimension showed a limited contribution.

10.4 Architectural Nostalgia Index (ANI)

Based on the empirical relationships between the dimensions and the overall nostalgia construct, a refined Architectural Nostalgia Index (ANI) was developed. The weighting coefficients were derived by normalizing the correlation values, ensuring that their sum equals one and reflects the proportional contribution of each dimension.

The index is expressed as follows:

$$ANI = 0.35E + 0.31S + 0.26M + 0.09F$$

10.4.1 Levels of Interpretation:

The computed ANI values were interpreted according to the following scale:

- 1.00 – 1.80 = Very Low
- 1.81 – 2.60 = Low
- 2.61 – 3.40 = Moderate
- 3.41 – 4.20 = High
- 4.21 – 5.00 = Very High

11. Results:

- Case 1 recorded ANI values within the high to very high range.
- Case 2 fell within the low to moderate range of architectural nostalgia.

As illustrated in Figure 5, there is a clear difference between the two cases across all architectural nostalgia dimensions, with Al-Mustansiriya School recording consistently higher values compared to Al-Mansour Mall.

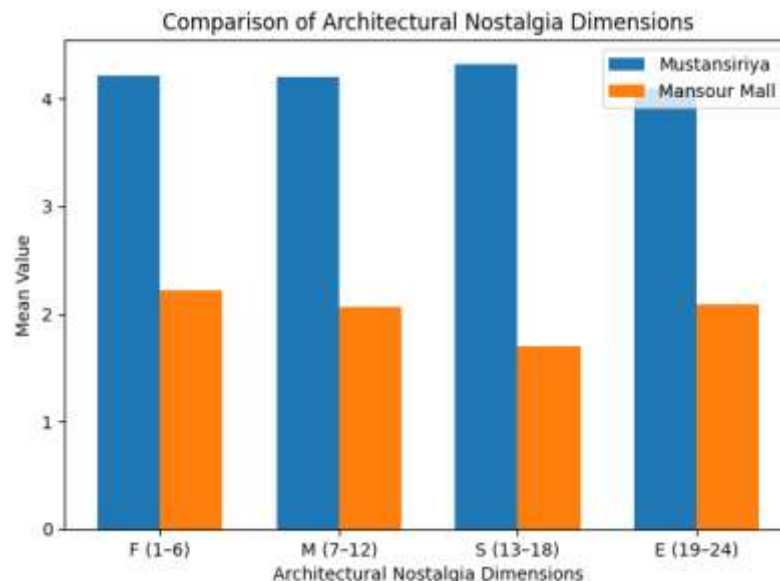


Figure 5. Comparative evaluation of architectural nostalgia dimensions and ANI between Al-Mustansiriya School and Al-Mansour Mall.

12. Discussion of Results

The results indicate that architectural nostalgia is not solely linked to formal characteristics, but rather emerges as a cognitive-emotional phenomenon resulting from the integrated interaction of multiple dimensions. Correlation analysis reveals that the perceptual-emotional dimension is the most influential in generating nostalgia ($r = 0.88$), followed by the symbolic-cultural dimension ($r = 0.78$) and the material-sensory dimension ($r = 0.65$), while the formal-referential dimension demonstrates a weak influence ($r = 0.23$).

This supports the interpretation of architectural nostalgia as a multidimensional construct primarily shaped by perceptual-emotional engagement rather than the replication of formal attributes. Such findings align with the phenomenological perspective in architecture, particularly Norberg-Schulz's concept of *Genius Loci*, where the meaning of place emerges through lived experience and existential connection rather than formal representation. They also resonate with Pallasmaa's argument that architectural experience is fundamentally multisensory, and that emotional impact is constructed through the interaction of sensory perception, memory, and spatial atmosphere rather than through visual form alone.

Furthermore, regression analysis indicates that the four dimensions collectively explain a substantial proportion of the variance in architectural nostalgia ($R^2 = 0.80$), confirming the explanatory strength of the proposed model and supporting the conceptualization of nostalgia as a composite indicator reflecting the quality of the architectural experience. The comparison between the two case studies further reinforces this interpretation. Spaces that integrate perceptual, symbolic, and sensory dimensions, such as the Mustansiriya School, demonstrate a higher capacity to generate architectural nostalgia. In contrast, environments lacking this integration, such as the Mansour Mall, exhibit weaker emotional engagement, which can be interpreted through the concept of placelessness. Accordingly, architectural nostalgia can be understood as an indicator of the quality of the architectural experience, reflecting the capacity of space to achieve a meaningful balance between form, perception, and cultural significance. This contributes to redefining the relationship between identity and modernity by emphasizing experiential and perceptual dimensions rather than relying solely on formal reproduction. As illustrated in Figure 6, the results highlight the differentiated impact of architectural dimensions on the generation of nostalgia

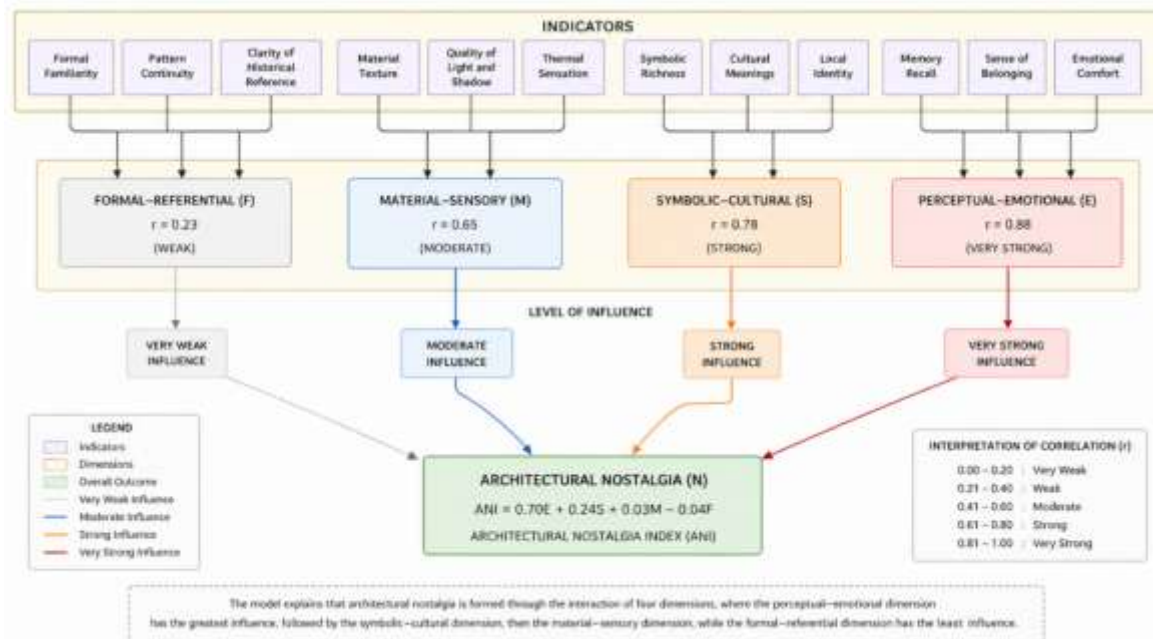


Figure 6. Multidimensional analytical framework of architectural nostalgia showing the relative influence of formal-referential, material-sensory, symbolic-cultural, and perceptual-emotional dimensions and the construction of the Architectural Nostalgia Index (ANI).

13 Conclusion

Architectural nostalgia is a multidimensional, quantifiable phenomenon, not merely an emotional response or a descriptive concept. It is formed from a complex interaction between:

- The perceptual-emotional dimension
- The symbolic-cultural dimension
- The material-sensory dimension

While the formal-referential dimension has a limited impact.

- The Mustansiriya School demonstrated a high capacity for generating architectural nostalgia due to the integration of different dimensions and their connection to the user's perceptual experience. In contrast, the Mansur Mall showed a weakness in generating nostalgia, due to the absence of symbolic depth and a weak perceptual-emotional response.
- The results showed that the perceptual-emotional dimension is the most influential in architectural nostalgia, followed by the symbolic-cultural dimension, then the material-sensory dimension, while the formal dimension had a weak impact.
- The results indicate that achieving architectural nostalgia does not depend on replicating historical forms, but rather on constructing an architectural experience with a perceptual-sensory dimension and cultural meaning. • The research presents an analytical framework linking architectural theory and quantitative application through a multidimensional model for measuring architectural nostalgia.
- Architectural nostalgia can be employed as an evaluative and design tool that contributes to creating spaces more connected to people and enhances the sense of identity and continuity.
- The study recommends expanding the scope of future research to include:
 - o Different architectural and cultural contexts
 - o larger samples
 - o Linking nostalgia to indicators such as quality of life and urban sustainability

This study contributes to the advancement of architectural theory by transforming nostalgia from a qualitative concept into a measurable, multidimensional construct.

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