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Architecture and Human Emotional Experience: A Framework for Studying Spatial Experiences: Egypt as a case study

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Abstract: One of the primary challenges in assessing the influence of architectural design elements on human emotional experience is determining which elements can promptly capture people's attention within a space and understanding the nature of the impact these elements have on individuals. This study addresses a key obstacle in comprehending the effect of architectural design elements on human emotions. The objective is to identify elements that stand out to people and immediately engage their attention in each space, examining how these elements contribute to the overall emotional experience in those spaces. Employing a survey framework, findings from a representative sample of 75 participants in Egypt indicate that specific elements, such as spatial scale and openness, the presence of windows and natural daylighting, adaptability of the space for isolation or social interaction, artificial lighting levels, and spatial density, can significantly influence human emotional experience. While these insights provide valuable guidance for design decision-making, it's important to note that the study focused on Egypt and gathered experiences from participants in that specific cultural context. Despite this focus, the framework has the potential for cross-cultural application, establishing a basis for objective evaluations of architectural design elements across diverse cultural and regional settings.

1. Introduction

The built environment exerts a significant impact on individuals across various dimensions, affecting both their productivity and well-being. Ongoing research into the relationship between buildings and human interactions has uncovered that healthier buildings have the

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potential to reduce healthcare costs, alleviate stress, enhance employee engagement and satisfaction, decrease absenteeism, and boost productivity [1], [2], [3]. The physical layout of workspaces is also recognized as a crucial factor in shaping individuals' decisions to stay in a job and influencing their job performance [4], [5]. Identifying the elements that resonate most with people and understanding the extent of their influence will facilitate the design of spaces that enhance emotional experiences within a specific architectural setting.

Human emotional experience within spaces refers to how the environment influences individuals' mood, calmness, and social interactions [6], [7], [8]. Architectural design elements are components that make a space unique and influence how people interact within the space [9], [10]. Through modulation of these elements as object symmetry, spatial flow, and volumetric openness, architects can influence the human psychological, sociological, and emotional experience occurring within a given space. Although there is extensive literature discussing different types of design elements and their outcomes, quantifying the impact of the interior-built environment on human emotional experience remains a challenge. Given that people spend most of their time indoors [11], it is crucial to identify and quantify the connection between the indoor built environment and overall human emotional experience.

Current design practices include various efforts to enhance building design regarding sustainability, occupant well-being, and performance. Green building initiatives focus on using renewable energy and recycled materials to lessen environmental concerns such as greenhouse gases and carbon footprint [12], [13]. The WELL Building Standard ensures that buildings are healthy for people working or living in them. Specifically, the WELL building standard emphasizes seven key features (quality of water, quality of air, fitness, lighting, nourishment, comfort, and mind). However, it primarily focuses on sustainable measures to promote the health of occupants, not the configuration of architectural design elements addressed to enhance the human emotional experience [12], [13].

On the other hand, Evidence-Based Design (EBD) relies on performance-based decisions supported by research, expert opinions, and occupant feedback. It is commonly used in healthcare facilities to improve patient satisfaction, productivity and safety of building users, and overall healthcare facility performance [14]. Typically, surveys and evaluations are conducted post-occupancy to gather information from people regarding their satisfaction with given spaces. However, it doesn't capture and identify design elements that have the most significant influence on reported satisfaction levels. In a review of the current research status using the keywords; Impact of architectural design elements on human emotional experience, through the Scopus Database, it was found that 220 related articles were published since 2004. Most of these articles (more than 80%) were published in Europe, North America, and Australia. None of the related studies were published in Egypt.

This study employs a comprehensive approach with integrating a survey experiment and literature review to synthesize findings from the collaboration of psychology and architecture. The experiment involves presenting participants with various architectural elements to evoke emotions tied to the presumably corresponding design element. Participants express their responses using Semantically differential Likert scales, capturing subtle connotations. The goal is to identify the most influential and noticeable design

elements and validate the emotional experience gathered from expert opinions and literature synthesis.

The research methodology is summarized in **Figure 1**, with steps including the literature review, creation of realistic representations of design elements, and the final survey experiment, followed by data analysis.

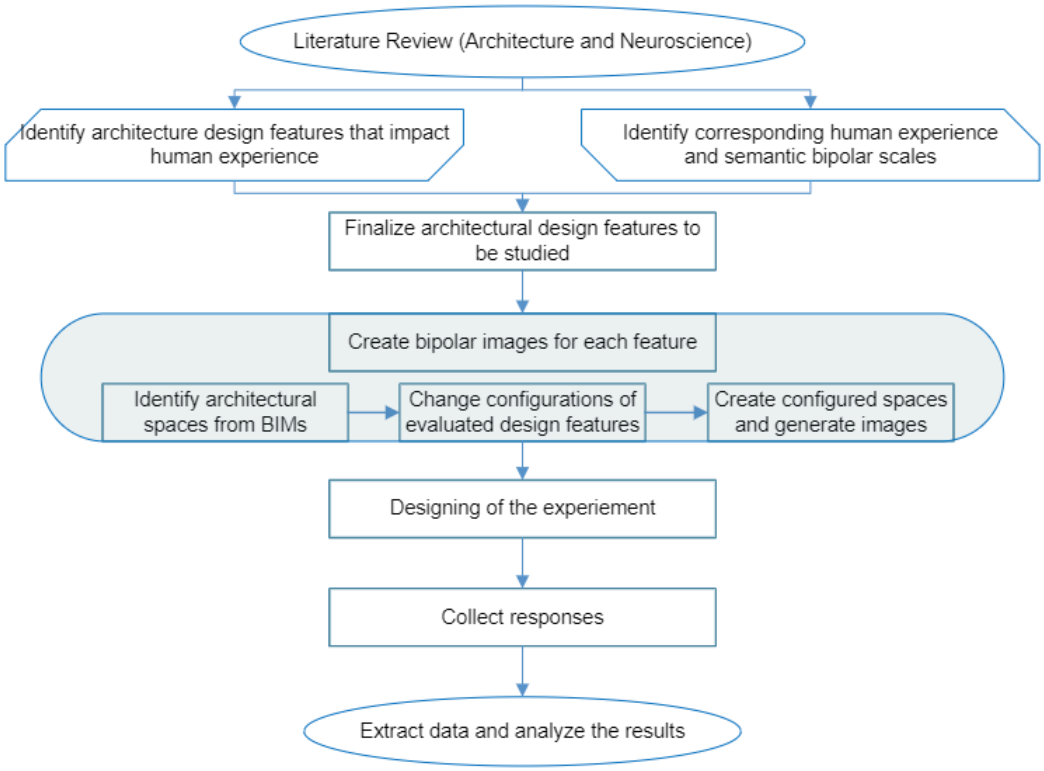

Figure 1 Overview of study steps

2. Background and research

This research focuses on how various architectural design elements influence the human emotional experience through utilizing semantically differential Likert scales identified and widely adopted in both fields of architectural design and psychology

2.1. Examining Architectural design elements and its connections with human emotional experience

Architectural design elements are assumed to shape the user emotional experience within a certain space, and the extent of their influence varies depending on each element and its specific arrangement [10]. The literature discusses different architectural design elements related to human emotional experience, with a particular focus on their emotional effects and how people perceive spaces crafted by these elements. To consolidate the insights from the literature, we have categorized architectural design elements discussed in previous research based on the type of presumed influence exerted on the architectural space users.

Table 1 demonstrates that the influence of architectural design elements on human emotional experience which can be grouped into four categories according to the emotional

experience induced the most, namely: "revitalization", "emotional stress and tension", "Aesthetic pleasure", and "inspiration."

The interplay between architectural design and individuals' emotional experiences, particularly in terms of revitalization and stress reduction, has been extensively examined across various contexts such as healthcare facilities, schools, and workplaces. Numerous studies have highlighted the significance of design elements in shaping emotional responses [15], [16], [17]. For instance, access to natural light, the presence of windows, indoor planting, and spatial configurations have all been identified as influential factors [18], [19], [20]. While certain elements like access to natural views have been associated with revitalization and increased attention levels [21], [22], others such as tall buildings with large windows have been linked to negative outcomes like stress and dissatisfaction [23]. Furthermore, factors such as lighting levels, color schemes, spatial layout, and flexibility for privacy or social interaction have been found to impact stress levels and overall aesthetic pleasure[14], [24], [25], [26]. Additionally, design elements play a crucial role in influencing work motivation and productivity, with considerations such as color coding, surface materials, space accessibility, and spatial connectivity being key factors [26], [27], [28]. Overall, these findings underscore the intricate relationship between architectural design and human emotional experiences, highlighting the importance of thoughtful design considerations in creating environments that support well-being and productivity.

Table 1 Architectural design elements influence on human emotional experience as concluded from the literature.

Element	**Category/ induced emotional experience**
1. Existence/lack of windows (Natural daylight) 2. Windows area (views if existed) 3. Reviving Natural Images/Natural elements displayed in spaces	Revitalization
4. Spatial interior Density 5. Height of ceilings (interior/ exterior) 6. Adaptability of the space for isolation or social interaction 7. Spatial scale and openness 8. Level of artificial lighting 9. Presence of a visible entrance/Perspective and existence of outside landmarks	Emotional stress and tension
10. Symmetrical objects 11. Spatial alignment presence 12. Shape/ layout of spaces 13. Shape of objects in spaces	Aesthetic pleasure
14. Building style 15. Color coding/ Approachability of common spaces	Inspiration

In summary, previous literature has identified four main categories of human emotional experience in architectural design spaces and 15 specific elements to investigate. However, there is still a gap regarding how the configurations of these architectural design elements influence specific experiences and the degree of influence each element exerts on

individuals. This research builds upon these 15 design elements, defines their levels of influence on people, their frequency of noticeability, and the preferred spatial configurations to enhance emotional experiences.

2.2. The use of Likert scales

A commonly employed method of research for investigating human emotional experiences with specific designs is to collect data from users via questionnaires to describe and rate their emotional experience, often referred to as an effect measurement.

Likert scales are rating tools designed to gauge the underlying meaning of various architectural elements. A Likert scale encourages respondents to evaluate two opposing characteristics and determine the proportionality of these opposite pairs with regards to emotional experience in each space. Numerous research studies employed Likert scales to assess the impact of individual design elements (e.g., windows area, space shape) on human emotional experiences. The results indicate that:

- Revitalization was rated with Likert scales such as pleasantness vs unpleasantness, energetic vs tiring , relaxation vs tension, etc. [18], [22], [29], [30], [31], [32], [33].

- Emotional stress and tension in spaces was rated using Likert scales such as freedom vs impediment , roomy vs constrained, degree of pleasantness vs unpleasantness, calming vs agitating, etc. [8], [14], [25], [26], [31], [34], [35], [36], [37], [38].

- Aesthetics pleasure was rated with Likert scales such as focus vs distraction , order vs chaos calming vs agitating, etc. [8], [35], [39], [40].

- Inspiration was rated using Likert scales such as exciting vs boring , thrilled vs saddened, calming vs agitated, etc. (e.g., [14], [38]).

Accordingly, a set of these previously identified rating Likert scales were employed in the survey to identify statistically significant ratings used by people to describe their emotional experiences in each space.

3. Methodology

The primary objective of this study is to highlight architectural design elements with significant impact on individuals, gauging the degree of influence and noticeability for each element, and discerning preferred configurations. To achieve this goal, the study employs a survey experiment and a comprehensive literature review, delving into psychology for architectural insights. The experiment is considered a pilot study involving participants from Egypt. Participants were presented with image sets representing distinct architectural design elements in authentic spatial contexts, aiming to evoke specific emotions without disclosing the focal design element. Responses were solicited through Semantically differential Likert scales - as explained in 2.2 above - capturing connotative meanings, such as rating the "presence/absence of daylight" on scales like pleasant-unpleasant, relaxed-tense, and energized-tired. The research methodology is outlined in **Figure 1** above, and the

entire process involves gathering blind responses from individuals regarding different configurations without revealing the underlying differences.

The initial step involved conducting a thorough literature review to define architectural design elements and their associated user emotional experiences, as discussed in the field of psychology and architecture. Subsequently, the findings from the literature were validated through consultations with experienced architectural engineers from notable Egyptian Universities and firms. The resulting set of design elements and semantic scales derived from this process were then used to create actual representations of each architectural element in dual-image sets corresponding to the presumably positive and negative ends of the Likert scale, all designed using building information models. The last step involved launching the experiment using a survey platform and subsequently analyzing the data collected.

3.1. Generating images for architectural design elements

For every element, two images were generated. Each image depicted a distinct configuration of that element (e.g., symmetrical space versus asymmetrical space) at the extreme ends of the related Likert scale. (Example images are illustrated in **Figure 2** as mentioned above). These dual images only exhibited a single element change, while all other main components of the space remained constant. The intention behind creating these images was to ensure they were as lifelike and meaningful as possible, enabling participants to immerse themselves fully in the depicted space and obtain a genuine experience.

3.2. Experiment design

In this experiment, 15 architectural design elements were included, as outlined in **Table 1**. Dual image sets created for the experiment were integrated into a survey platform made accessible to all participants. The survey consisted of two sections; a core section and a separate section for each architectural elements, with a total of 50 questions distributed over all sections, with each architectural element section containing three questions that appear to the participants based on their selections.

The core section encompassed demographic inquiries. Conversely, in each distinct section, participants were tasked with choosing their preferred space from the corresponding dual image set. They were then required to rate the spaces using provided multiple semantically differentiated Likert scales specific to each dual image set. Finally, participants were asked to articulate their feelings about each image briefly. The dual images designed to illustrate the positive and negative extremes of the relevant elements, based on the suggested meanings outlined in the literature, as previously explained. For example, in the case of window size, a high window-to-wall ratio indicated the positive end of the scale, while a low window-to-wall ratio denoted the negative end. Likewise, for the contour of objects, round depictions represented the positive end, contrasting with sharp-edged depictions for the negative end. It is crucial to note that participants received no information regarding the element, or its configurations being assessed in each dual image set.

Element Presence of windows

Images

Setting With window No window

User emotional experience(s) associated: Sense of pleasure and well-being

Likert scale used: Relaxed/tense, tired/energized, pleasant/unpleasant

Element Reviving Natural Images and natural elements displayed in spaces.

Images

Setting With Nature No nature

User emotional experience(s) associated: Sense of engagement – Sense of pleasure and well-being

Likert scale used: lively/bored, disappointed/delighted, relaxed/tense

Figure 2 Example of generated images

3.3. Statistical Analysis

Data provided from the 75 participants was analyzed statistically to identify the most preferable configurations for each architectural design element, and to measure the level of their influence on people. Statistical analysis was performed using Prism GraphPad Software 9.0.0. The aim was to identify any statistically significant difference between the different spatial configurations of a given architectural design element. Comparison of quantitative variables was done using student t-test for normally distributed data and Mann Whitney U test for non-normally distributed data given the nature of the sample, as it detects any overall differences between related means. P value is always 2 tailed set significant at 0.05 levels

4. Results

4.1. Demographic data of participants

Data was collected from 75 participants who successfully completed the experiment/survey (representing 80% of the total participants). The participants distribution with respect to their age, gender, and level of education is provided in **Table 2**.

Table 2 Demographics of participants

Range	Number	Percentage
Age		
18-25	4	6%
26-34	9	13%
35-54	28	41%
55-64	22	32%
65 or over	6	9%
Gender		
Male	49	71%
Female	20	29%
Highest level of education		
Doctoral or Professional Degree	29	42%
Master's Degree	2	3%
Undergraduate degree	5	7%

4.2. Descriptive data analysis

The analysis of data collected through the survey indicates notable differences in people's preferences concerning architectural design elements. The responses clearly demonstrate that individuals favored configurations of architectural design elements that aligned with what is perceived as the "positive end" of the Likert scales. As shown in **Figure 3**, people showed a preference for specific design elements, including presence of natural daylight, larger windows configuration, environments that provided a sort of nature connection, rooms with high ceilings, interior adaptability of the space for isolation or social interaction, spatial scale and openness color-coded surfaces, sufficient luminance levels rather than darker settings, spaces featuring existence of landmarks for spatial orientation, areas where symmetry and spatial alignment was exhibited , regular room layouts, spaces with objects that has rounded surfaces as opposed to sharp-edged ones, and spaces designed for easy access with clearly identifiable entry points (e.g., a prominently visible entrance).

These preferences closely align with the principles discussed in existing literature regarding the creation of positive and negative user emotional experiences. Therefore, the results provide additional support for the main hypotheses established in earlier research studies. Notably, there was an observation related to ceiling height, where 49% of participants favored spaces with lower ceilings, which contradicted the initial hypothesis. This discrepancy can be attributed, in part, to the specific dual image set used which depicted a

conference room. In this context, the visual ratio of the space allowed a lower ceiling height.

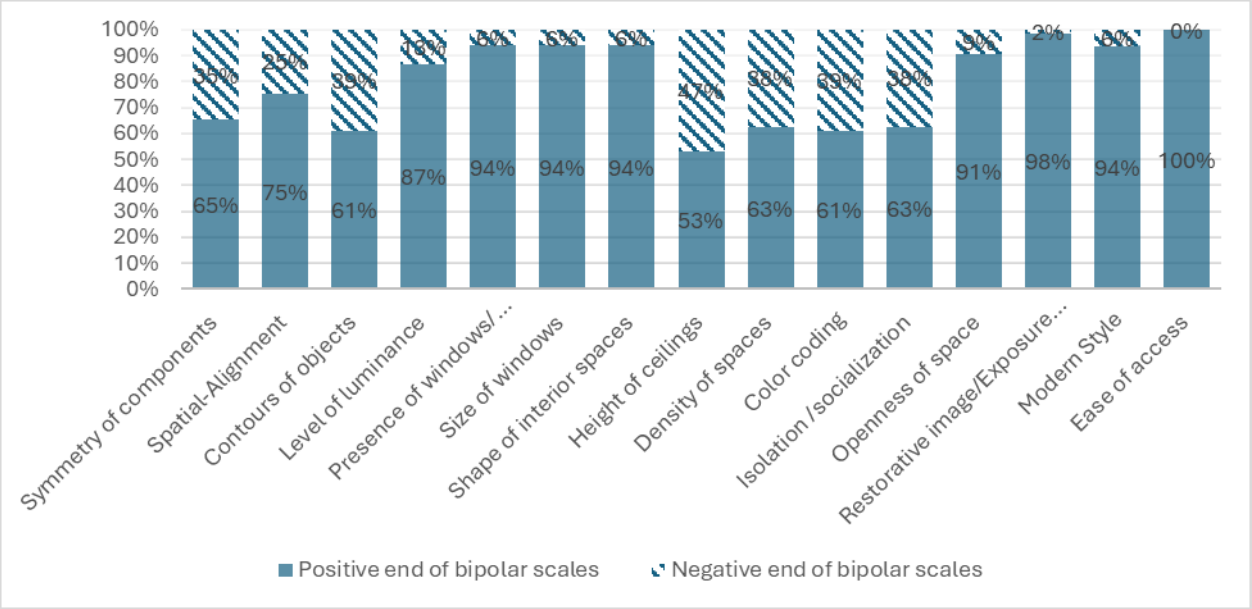

Figure 3 Different individual preferences for architectural design elements

4.3. Descriptive data analysis

Table 3 provides a summary of the statistical analysis regarding people's preferences for various configurations of architectural design elements. The findings indicate that there are statistically significant differences in people's preferences for each architectural element between the two presented configurations, with the majority favoring configurations that align with the positive end of the Likert scales. The null hypothesis suggested that the percentage of participants favoring the positive arrangement of a specific architectural design feature was equivalent to those favoring the negative arrangement. Nevertheless, the findings indicate a statistically significant difference in the proportions of preferences for the two configurations of the design feature, as evidenced by a p-value below 0.05.

Regarding the remaining design elements, people typically favored environments arranged to evoke positive emotions, such as open spaces over enclosed ones, as detailed in the second column of **Table 3**. The individuals' responses also displayed noteworthy variations in preferences for each dual image set, as indicated by the p-values in the middle column. In general, these findings correspond with established recommendations in existing literature concerning the optimal configurations of design elements to elicit a positive emotional experience, for instance, favoring spaces with access to nature over those lacking such exposure.

To gauge the significance of responses on bipolar Likert scales, t-tests were employed to compare user rating means between the two configurations of a given architectural design element. The null hypothesis posited that participants' ratings for each configuration of a design element would be identical, implying indifference towards the configurations presented in the dual image sets. However, as outlined in **Table 3**, the results reveal that the mean ratings assigned by participants for positive configurations of elements significantly differ (with p-values<0.05) from the mean ratings for the negative configurations of

architectural elements. According to the t-test outcomes, individuals experienced markedly distinct sentiments when envisioning themselves in spaces arranged to evoke positive versus negative emotional experiences.

Table 3 Statistical analysis summary

No.	Element	Preferred setup	% of preferred setup	p-value (fisher)	Likert scales	p-value
1.	Existence/lack of windows (Natural daylight)	Existence of windows and daylighting	93.94%	**<0.0001**	Relaxed	**<0.0001**
					Energized	**<0.0001**
					Pleasant	**<0.0001**
2.	Windows area and views	Larger window area	93.85%	**<0.0001**	Relaxed	**<0.0001**
					Energized	**<0.0001**
					Pleasant	**0.0009**
3.	Reviving Natural Images/Natural elements displayed in spaces	Presence of natural elements	98.44%	**<0.0001**	Lively	**<0.0001**
					Delighted	**<0.0001**
					Relaxed	**<0.0001**
4.	Spatial interior Density	Higher density space	62.50%	**0.0078**	Open	**0.0039**
					Roomy	**0.0025**
					Pleasant	**<0.0001**
5.	Height of ceilings (interior/ exterior)	Higher ceiling	53.13%	0.5961	Open	0.2246
					Roomy	0.1547
					Pleasant	0.5541
6.	Adaptability of the space for isolation or social interaction	No hard separations	62.50%	**0.0078**	Free	**<0.0001**
					Calm	**0.0961**
					Pleasant	**0.0132**
7.	Spatial scale and openness	Open space with partial enclosure	90.63%	**<0.0001**	Open	**<0.0001**
					Delighted	**0.0122**
					Pleasant	**0.0190**
8.	Level of artificial lighting	Bright	86.57%	**<0.0001**	Relaxed	**<0.0001**
					Happy	**<0.0001**
					Pleasant	**<0.0001**
9.	Presence of a visible entrance / Perspective and existence of outside landmarks	Visible	100%	**<0.0001**	Lively	**<0.0001**
					Calm	**<0.0001**
					Pleasant	**<0.0001**
10.	Symmetrical objects	Symmetrical	65.22%	**0.0006**	Calm	**<0.0001**
					Focused	**<0.0001**
					Ordered	**<0.0001**
11.	Spatial alignment presence	Alignment present	75.36%	**<0.0001**	Calm	**<0.0001**
					Comfortable	**<0.0001**
					Ordered	**<0.0001**
12.	Shape/ layout of spaces	Normal shape and aspect ratio	93.85%	**<0.0001**	Relaxed	**<0.0001**
					Calm	**<0.0001**
					Excited	**<0.0001**
13.	Shape of objects in spaces	No rounded contour	60.87%	**0.0168**	Relaxed	**<0.0001**
					Engaged	**<0.0001**
					Pleasant	**<0.0001**
14.	Building style	Modern	93.75%	**<0.0001**	Delighted	**<0.0001**
					Excited	**<0.0001**
					Pleasant	**<0.0001**
15.	Color coding/ Approachability of common spaces	Color coded	60.94%	**0.0212**	Cheerful	**0.0041**
					Calm	0.1312
					Clear	0.9922

The only instances of deviation were noted in the "height of ceiling" and "Color Coding" design elements, where the disparity in the percentage of element selection was minimal. The p-value associated with user experience ratings for these elements exceeded the threshold of 0.05, indicating that the emotional experiences of users did not exhibit statistically significant differences between the pre-identified positive and negative architectural elements. Therefore, it can be inferred that either these bipolar Likert scales were not effective in eliciting user emotional experience ratings for the specified design elements, or users perceived these elements with indifference.

5. Discussion

The statistical analysis of the survey data revealed compelling insights into the impact of the architectural elements on user preferences and emotional experiences. It became evident that, except for "height of ceiling," all the design elements examined exhibited statistically significant differences between the two configurations presented in the experiment. This finding underscores the substantial impact of design choices on people's perceptions and preferences within architectural spaces. To gain a deeper understanding, the researchers employed a metric known as "partial eta-squared" to understand the effect size of each element. This metric quantifies how people perceive these elements, shedding light on their relative influence. The results, as summarized in **Table 4**, offer a ranking of the impact power for each design element. At the forefront of this ranking are elements that exert significant influence over user emotional experiences as discussed below:

Table 4 Ranking of the Architectural Features according to influence level

Architectural design element	**Partial eta – squared**	**Effect size**	**Example of the words used to describe the mostly selected elements**
Reviving Natural Images and natural elements displayed in spaces.	**0.677**	**Large**	Interesting/inviting/happy
Color coding/ Approachability of common spaces	**0.603**	**Large**	Welcoming/inviting
Spatial scale and openness	**0.533**	**Large**	Open/bright/spacious
Existence/lack of windows and natural daylighting	**0.528**	**Large**	Light/open/window
Adaptability of the space for isolation and social interaction	**0.426**	**Large**	Open/free/exposed
Level of artificial lighting	0.345	Large	Bright/light
Building style (Texture/material)	0.344	Large	Modern/open/bright
Symmetrical objects	0.275	Large	Symmetrical/balance
Windows area (views if present)	0.208	Large	Bright/open/light

Architectural design element	Partial eta – squared	Effect size	Example of the words used to describe the mostly selected elements
Spatial interior density	0.195	Large	Roomy/open/empty/lonely
Spatial alignment presence	0.175	Large	Aligned/straight/ordered
Shape of objects in spaces	0.13	Medium	Round/circle/curvy
Shape / layout of space	0.128	Medium	Balanced/ordered/normal
Color coding/approachability of common spaces	0.117	Medium	Colorful/happy/bright
Height of ceilings (exterior/interior)	0.008	Small	Roomy/opened/relaxed
Bolded: Top impactful design elements based on statistical analysis; Italicized: Design elements that are noticeable in the presented spaces - based on frequency of words used to express emotional experience with respect to meaning of the element			

Reviving natural images: Spaces that incorporated elements of nature, such as greenery or outdoor views, were highly influential. Participants clearly favored environments with a connection to the natural world. **Approachability of common spaces**: Environments that were easily accessible and navigable ranked prominently. Spatial layout and accessibility emerged as critical factors in shaping user emotional experiences. **Spatial openness**: Spaces characterized by an open layout, as opposed to enclosed or confined areas, garnered strong positive responses. Openness significantly contributed to a pleasant overall emotional experience. **Existence of windows and natural daylight**: Natural lighting, provided by ample windows and exposure to daylight, held a position of prominence. This element contributed substantially to the ambiance and mood of a space. **Adaptability of the space for isolation and social interactions**: Environments that offered flexibility, allowing individuals to either isolate themselves or engage in social interactions, received favorable feedback. This flexibility offers to diverse user needs and preferences. **Level of artificial lighting**: Adequate lighting levels, as opposed to dim or poorly lit spaces, exerted a noteworthy influence on user emotional experiences. Appropriate lighting contributed to a more positive atmosphere. **Texture/Material of Surfaces**: The texture and material of surfaces within a space emerged as influential factors. These design elements influenced both perceptible and visual aspects of the experience. **Symmetrical objects**: Symmetrical arrangements and objects were associated with positive emotional experiences. Symmetry conveyed a sense of balance and order within the space. These elements, identified as highly influential based on their partial eta-squared values, serve as essential tools for architects and designers striving to shape user emotional experiences within a space. Their substantial impact on perceptions suggests that prioritizing these design elements can lead to more favorable user emotional experiences.

Furthermore, when analyzing the frequency and types of words used by participants to describe their feelings about each space, it became evident that people could effectively articulate their emotions in words that closely aligned with the specific design element

being evaluated. This alignment underscores the clarity of participants' responses and their ability to express their emotional experiences accurately. Moreover, certain design elements were particularly noticeable to participants when used to create distinct user emotional experiences. This included spatial scale and openness, the existence of windows and natural lighting, adaptability of the space for isolation or social interaction, level of artificial lighting, special interior density, and presence of color coding. Participants readily noticed and referenced these elements in their responses, highlighting their significance in shaping user perceptions. However, it's worth noting that the absence of certain elements, such as spatial alignment and exposure to nature, was also noticeable and elicited specific responses from participants. This suggests that the presence or absence of these elements can have a pronounced impact on user emotional experiences.

In summary, the findings presented in **Table 4** provide a comprehensive ranking of architectural design elements based on their influence and outstanding level. These insights can serve as valuable guidelines for design practitioners, enabling them to make informed decisions that enhance the overall user emotional experience within various architectural spaces.

6. Conclusions

A survey experiment was designed based on insights gathered from expert elicitation and an extensive literature review. This experiment sought to pinpoint the architectural design elements that exert the greatest influence and are readily noticeable, shaping diverse user experiences within different spaces.

The outcomes of this experiment highlighted the importance of specific design elements in shaping user preferences and perceptions. Notably, spaces that seamlessly integrated with nature, offered easy accessibility, embraced openness over enclosure, featured abundant windows and basked in natural daylight, and provided a high degree of flexibility for both isolation and socialization exhibited remarkable influence over individuals' emotional experiences. These design attributes emerged as the foremost contributors to positive user emotional experiences, as underscored by their high partial eta-squared values in the statistical analysis.

Furthermore, the results unveiled certain design elements that were inherently conspicuous to individuals when employed to create distinct user emotional experiences. These encompassed the spatial layout's openness, the presence of windows and the infusion of natural light, the adaptability of spaces for isolation or social interaction, the level of artificial lighting, the spatial density, and the choice of surface colors. Participants readily noticed and referenced these elements in their assessments, underscoring their significance in shaping user perceptions.

Notably, the elements that were conspicuous to people also exhibited a notable capacity to transform the overall user emotional experience, aligning noticeability with influential power. This valuable revelation furnishes design practitioners with a clear hierarchy of these

design elements, aiding them in making informed decisions to enhance user emotional experiences in various architectural settings.

Moreover, these findings extend beyond practical applications and offer valuable insights for researchers. The subset of influential elements identified in this study will serve as the foundation for future experiments aimed at quantifying the effects of these elements on human physiology and task performance. The envisioned research endeavors will harness advanced technologies such as body area sensor networks to collect data on various physiological parameters, including brain signals, heart rate variability, facial expressions, and skin conductance. By linking these physiological responses to specific configurations of architectural design elements, researchers will gain a more comprehensive understanding of the intricate relationship between the built environment and human emotional experiences.

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تأثير عناصر التصميم المعماري على أحاسيس المستعملين داخل الفراغات المعمارية دراسة حالة من جمهوره مصر العربية

الملخص بالعربى

يعد تقدير وقياس دور عناصر التصميم المعماري على الإحساس النفسي لمستخدمي الفراغ المعماري؛ أحد التحديات الأساسية في الفهم الجيد وإدراك كيفية ومدى تأثير هذه العناصر على المستخدمين.

تهدف هذه الورقة البحثية الى رصد وقياس تأثير عناصر التصميم المعماري على النفس البشرية؛ وتحديد العناصر ذات التأثير المباشر على الناس والتي تشغل حيزا كبيرا من اهتمامهم داخل الفراغات المعمارية، ودراسة كيفية مساهمة هذه العناصر على الإحساس العام داخل الفراغات.

قام البحث بأجراء استبانة على عدد ٧٥ مبحوث من "مصر", واظهرت النتائج ان العناصر التصميمية مثل: الاتساع الفراغي والانفتاح للخارج ووجود الشبابيك والاضاءة الطبيعية وقدرة الفراغ على تحقيق الخصوصية ومستويات وتوزيع الإضاءة الصناعية؛ هي من العناصر ذات التأثير الأكبر والاوضح على الإحساس النفسي لمستعملي الفراغات.

تقدم هذه النتائج دليل واضح للمصممين المعماريين وتساعد في اتخاذ القرارات التصميمية المناسبة التى تحقق رؤية المصمم التي ينشدها، ومن الأهمية بمكان ملاحظة انه بالرغم من ان هذه الدراسة قد ركزت على المبحوثين "المصريين " والذين قد تجمعهم خلقية ثقافية متشابهة، فان أسلوب البحث المتبع يمكن ان يمتد للثقافات الأخرى واضعا أساسا للتقييم الموضوعي لتأثير عناصر التصميم المعماري على شعور المستعملين.