

Effect of Architectural Components on User Experience

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Abstract

“Architecture is the will of an epoch translated into space” (Mies Van Der Rohe). The above quote expresses the idea of how an epoch (The architect) plays a major role in how a space is designed. Similarly, this research looks at how the various architectural components affect the experience of the user. Different architectural styles introduced various elements, forms and components. The orientation of different components results in varied experiences of space. But, there is minimal research on how one should utilize these architectural components to provide the required experiences to the user and can have some affinity with the psychology of the user. The research takes an experimental and experiential approach studying what kind of architectural components can provide the desired experiences. The research also incorporates expert study to further solidify the results that the research is aiming to achieve. All these vague purposes on how the architectural components should be used to provide the ideal function designated to that space. This research offers valuable insights on how to effectively use various forms, sizes, and orientations of architectural components to shape user experiences. However, these references should not be viewed as strict rules; rather, they serve as flexible guidelines informed by expert opinions and case studies. While these recommendations reflect the majority consensus on how spaces are perceived, they may not always align perfectly with the unique psychological needs of every client.

Keywords: User experience, Architectural components, Psychology, Open Spaces, Building Typology, Built Environment

INTRODUCTION

Architectural components help us to devise the building typology, the context of the site, and also the surrounding built environment. As we all know, these architectural components still govern a little bit of what kind of spaces we are creating, these are divided into three vague spaces- Public spaces, Private Spaces and Semi-Private spaces. These architectural components also give way to detailed spaces like corridors (two walls on both sides, giving way to each ends of the passage.), Amphitheatres (Long span structures with roof on top or not, open on all sides, stairs/seating for the audience), Cinema Halls (Another long span structures with columns on the sides and not in the middle to enhance the viewing experience, and a curved roof and other components to enhance the acoustics of the space.), etc. These architectural components also help us utilize the climate to increase the sustainability of space [1].

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The research paper focuses on the various forms of architectural components and how one can utilize them to provide the desired user experience to the user. The guidelines are to be articulated to ease the need for looking at multiple books as to decide what form, size, or orientation of the architectural components can help them deliver the desired user experience. The research paper looks at the following objectives as to derive the guidelines [2].

- To understand the Basic Architectural components and the experiences felt in a space with respect to the Architectural components present in the space.

- Experimenting with the forms and orientation of the basic Architectural components and then understand the various experiences that are felt with respect to the “new” Architectural components.
- Provide a guide regarding what feelings were experienced in the space with respect to what Architectural components.

LITERATURE REVIEW

The research looks at what factors play a role in the quality of architectural work and how one can resolve the conflict regarding the experiences between the architect and the user. This just focuses on the emotional connection of the user with space but not the physical experience of space [3]. This also looks at a broader concept of architecture which affects the emotional experience, but does the scope of the current research narrow it down to just the physical architectural elements?

To explore the idea of using game engines to provide a better understanding of the experience of the space to the architect and the user. The inability to provide the experience of the space to the user without visiting or experiencing the space in real life, it looks at how the utilization of gaming engines can help the designing experience to provide the desired experiences to the user via virtual reality walkthroughs and could help revise the designs before they are actually constructed or implemented [4]. The research looks into the integration of game engines to enhance the designing process to provide the desired experiences to the user. It allows one to be introduced to the experiences one goes through while traversing their space. The research did look at the routes one can take to provide the desired experience to the user but doesn't provide the guidelines on how one should manipulate the architectural elements to enhance or degrade the user experience [5].

This study seeks to find the answers: “How does components impact on user experience?” And “Does only components types’ of impact or different size of components has their different influence?” User interaction is essential for predicting a space's future function in architectural design, yet scenario-based design—common in other fields—lacks clear application here. Architects often overlook user diversity and rely on personal experiences rather than consulting actual users, which can lead to misaligned design outcomes. The research paper looks into the study of the users and implementing the study into scenarios to be considered during the design process. The research majorly looks into the educational models of spaces and how a user's psychology is regarding the space. They looked into how one can look into the user's psychology and enhance the quality of the space [6]. The research focuses on the architect- user interaction during the design process as to provide more insight into the ideas of the user so that the architect can provide the desired outcome. However, this does not look into how one can utilise the various forms and sizes of architectural elements available to us to provide the desired user experience [7]. This research may be helpful to actually receive the user's idea of the space, but to actually deliver the expected outcome the architect should know how to utilise the architectural elements that make up a space efficiently, like through a guide.

The research paper looks into the multiple senses of the human body and how we can utilise these senses to design an apt space which makes full use of these senses [8]. Such a multisensory approach will hopefully lead to the development of buildings and urban spaces that do a better job of promoting our social, cognitive, and emotional development, rather than hindering it, as has too often been the case previously [9]. The research looks into the multisensory approach to designing a space. This research may help the study by understanding how the said sense is triggered in a space, as these senses lead to the kind of experience one has in that said space. However, the paper doesn't look into how one can use the architectural components to promote the engagement of the senses and manipulate what one feels in the designed space. To understand the neuroaesthetics of architectural space by studying the effects of space on the brain activity of a human. These are hidden sensitivities the visual brain harbours with respect to architectural interiors. This study takes the first steps towards experimental neuro architecture and tells the people how and what kind of design one should do to achieve one of the three or a combination of them to design a space for their desired user experience. The study focuses on the

hidden effects on the brain through the medium of architectural interior and provides few dimensions providing the kind of architectural interior provides what kind of dimension. However, the paper only looks into the interior aspect of architecture as a whole, and the research into how various architectural components induce various kinds of user experience is missing.

This study explores how architectural components affect users' psychological responses by combining neuroscience and architecture. Using fMRI scans and surveys, it found that pleasant spaces enhance attention and memory, with texture and geometry playing key roles in user perception. The research suggests that incorporating neuroscience insights into design can improve user satisfaction and environmental behavior, despite challenges in accessing imaging equipment. The research paper looks into the user's spatial evaluation of an architectural space through the effect of architectural components, however it doesn't specify the kind of geometry and textures are to be used to provide a pleasant space and which shouldn't be used to avoid designing an unpleasant space [10].

CASE STUDIES

Falling Water: A Symphony of Nature and Architecture

Architectural Vision

Frank Lloyd Wright's Falling Water is an (Figure 1) iconic example of organic architecture, where design harmoniously integrates with the natural environment. Built over a waterfall in Pennsylvania, the house epitomizes Wright's philosophy of creating structures that are "of the land" rather than "on the land." The concept emphasizes the unity between human habitation and the natural world, fostering an immersive experience that transcends traditional architectural boundaries.

Design Features

Cantilevered Terraces

- These terraces extend dramatically over the waterfall, creating a floating effect that immerses the user in the surrounding landscape.
- The structural innovation of cantilevers eliminates the need for vertical support, enhancing openness and providing unobstructed views of nature



Figure 1. Fallingwater at Mill Run, Pennsylvania

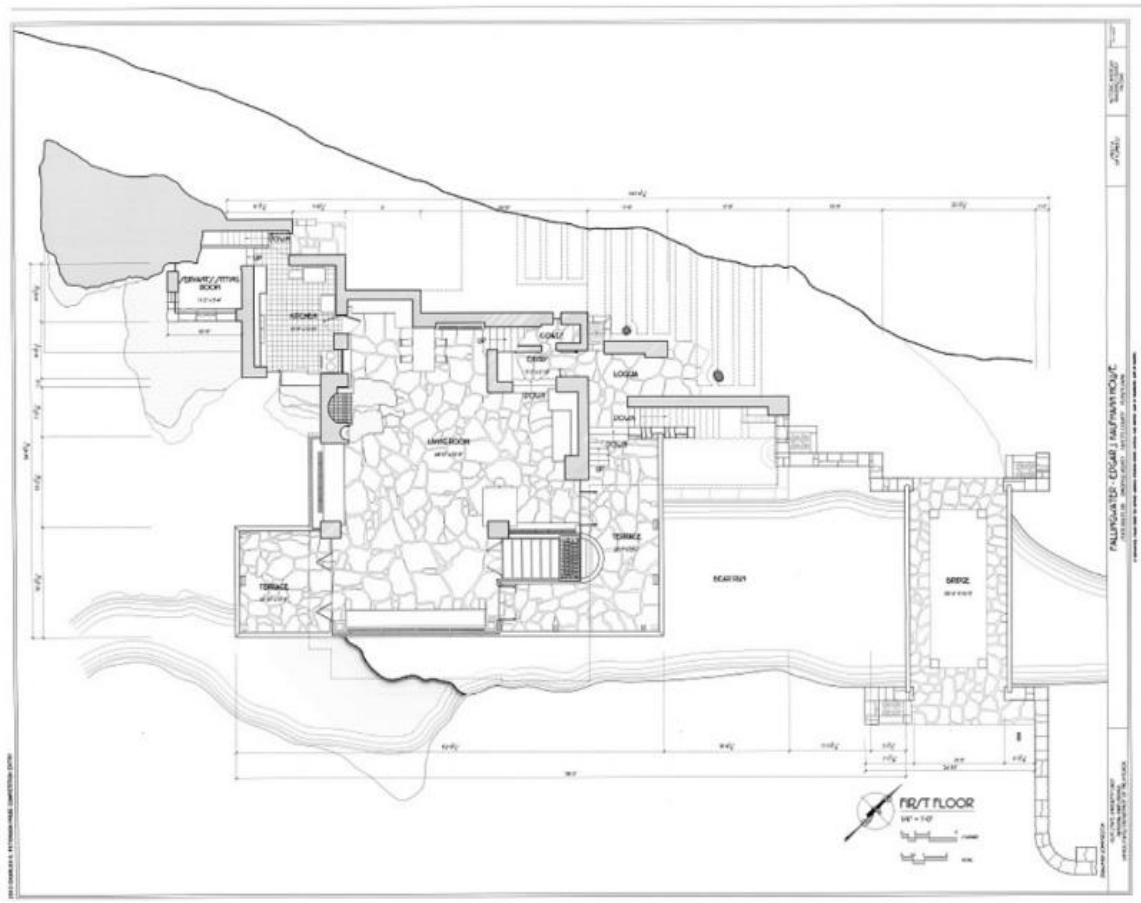


Figure 2. Fallingwater Plan (First Floor Plan – Falling water, State Route 381 (Stewart Township), Ohiopyle, Fayette County, PA, n.d.)

Materiality

- The use of natural stone, concrete, and wood mirrors the textures and colors of the environment, ensuring that the house blends seamlessly into its setting.
- The local sandstone used for walls ties the structure to its geographical context, enhancing the sense of place.

Water Integration

- The waterfall is an integral part of the design. The sound of cascading water permeates the interiors, creating a multisensory experience.
- The house's design directs the user's movement toward views of the waterfall, reinforcing a deep connection to nature.

Spatial Flow

Wright's open-plan design eliminates rigid spatial boundaries, allowing users to flow between spaces. The interplay of indoor and outdoor areas enhances the feeling of freedom and continuity (Figure 2).

User Experience

Sensory Immersion

- The sound of water, the earthy scent of stone, and the visual blend of natural and built elements create a rich sensory palette.
- Users often describe feelings of tranquility and awe, heightened by the unique integration of natural light and shadow.

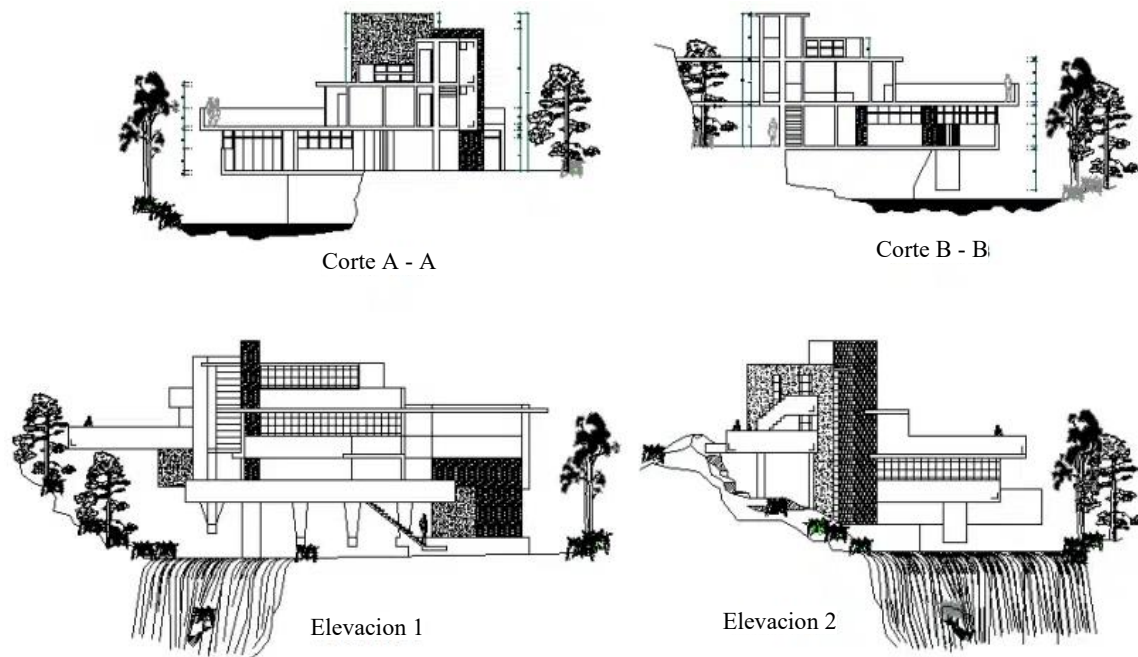


Figure 3. Elevations (*Section and Elevation Falling Water Frank Lloyd Wright Plan, n.d.*)

Emotional Impact

- The proximity to nature evokes a profound sense of connection, grounding users and fostering mindfulness.
- The dynamic design—juxtaposing solid stone with light, open space stimulates curiosity and wonder.

Psychological Comfort

- The material warmth and spatial openness provide psychological relief, promoting relaxation and well-being.
- The seamless transitions between spaces reduce cognitive load, allowing users to engage more deeply with their surroundings (Figure 3).

Architectural Innovations

Structural Ingenuity

- The cantilevered design was a bold engineering feat, pushing the limits of material strength and construction techniques.
- This innovation paved the way for modernist approaches to blending functionality with aesthetic boldness.

Integration with Nature

- Wright's philosophy of "breaking the box" challenged conventional rectilinear designs, instead creating fluid forms that mimic natural geometries.
- Fallingwater is celebrated as an exemplar of biophilic design, emphasizing human-nature connectivity long before the concept gained prominence (Figure 4).

Relevance to Contemporary Design

Biophilic Design Principles

- Fallingwater serves as a foundational example for architects seeking to integrate natural elements into urban and residential designs.
- It highlights the psychological benefits of connecting people with natural environments, influencing sustainable and wellness-focused architecture.

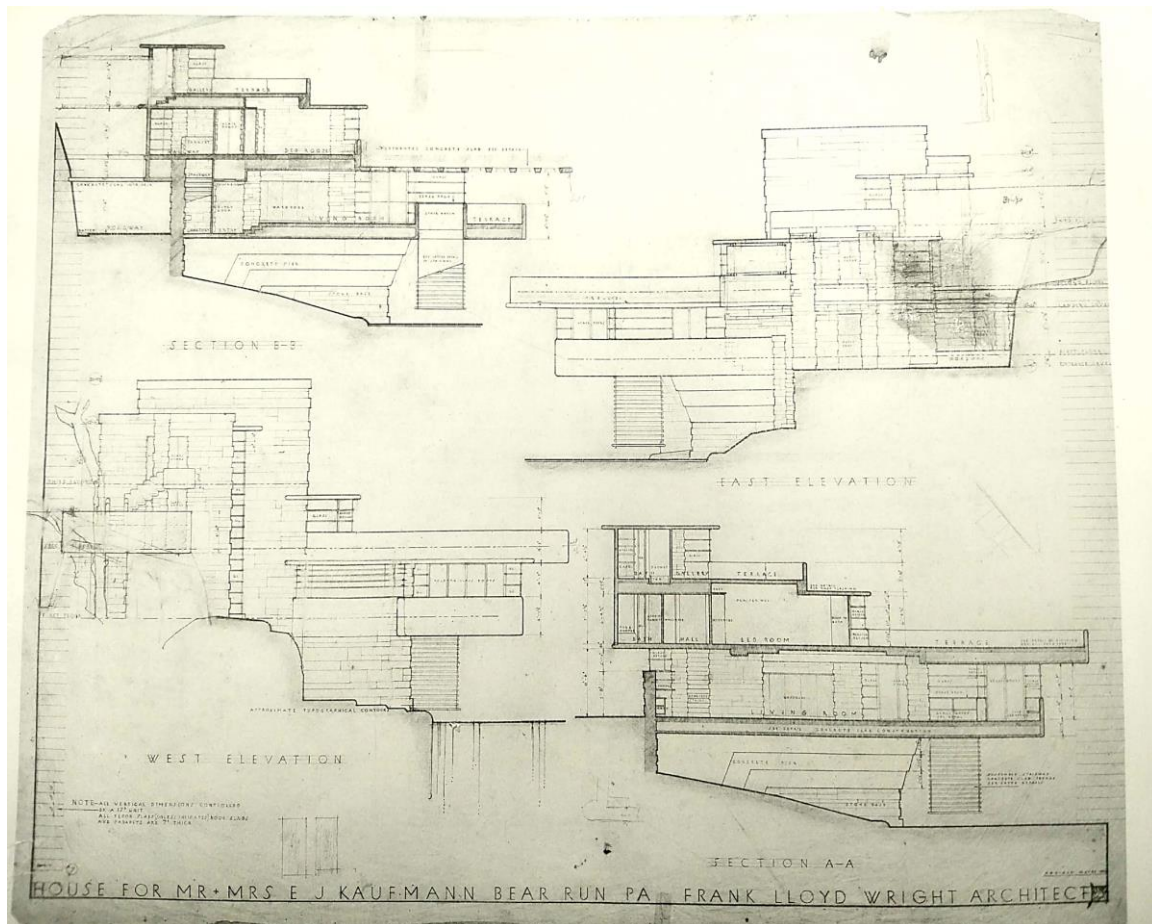


Figure 4. Sections (Wright & Pfeiffer, 1984).

Sustainability Lessons

- The house demonstrates how locally sourced materials can reduce environmental impact while enhancing a project's contextual relevance.
- Wright's consideration of natural site features prefigures modern ecological sensitivity in architecture (Figure 5).

Supporting Research and Insights

Neuroaesthetics

Studies on neuroarchitecture, such as those underscore the emotional and cognitive benefits of spaces like Fallingwater, where coherence and fascination are heightened.

Multisensory Design

Research on sensory design corroborates the importance of integrating sound, texture, and light in creating engaging environments, as exemplified by Fallingwater.

Biophilic Frameworks

The concept of prospect and refuge—where open views (prospect) are balanced with enclosed spaces (refuge) is evident in Fallingwater's design, enhancing user comfort and safety.

Villa Savoye: The Embodiment of Modernist Principles

Le Corbusier's Villa Savoye, constructed between 1928 and 1931 in Poissy, France, is a quintessential example of modernist architecture (Figure 6). It reflects the principles outlined in his famous "Five Points of Architecture," which emphasized functionality, simplicity, and the harmonious integration of

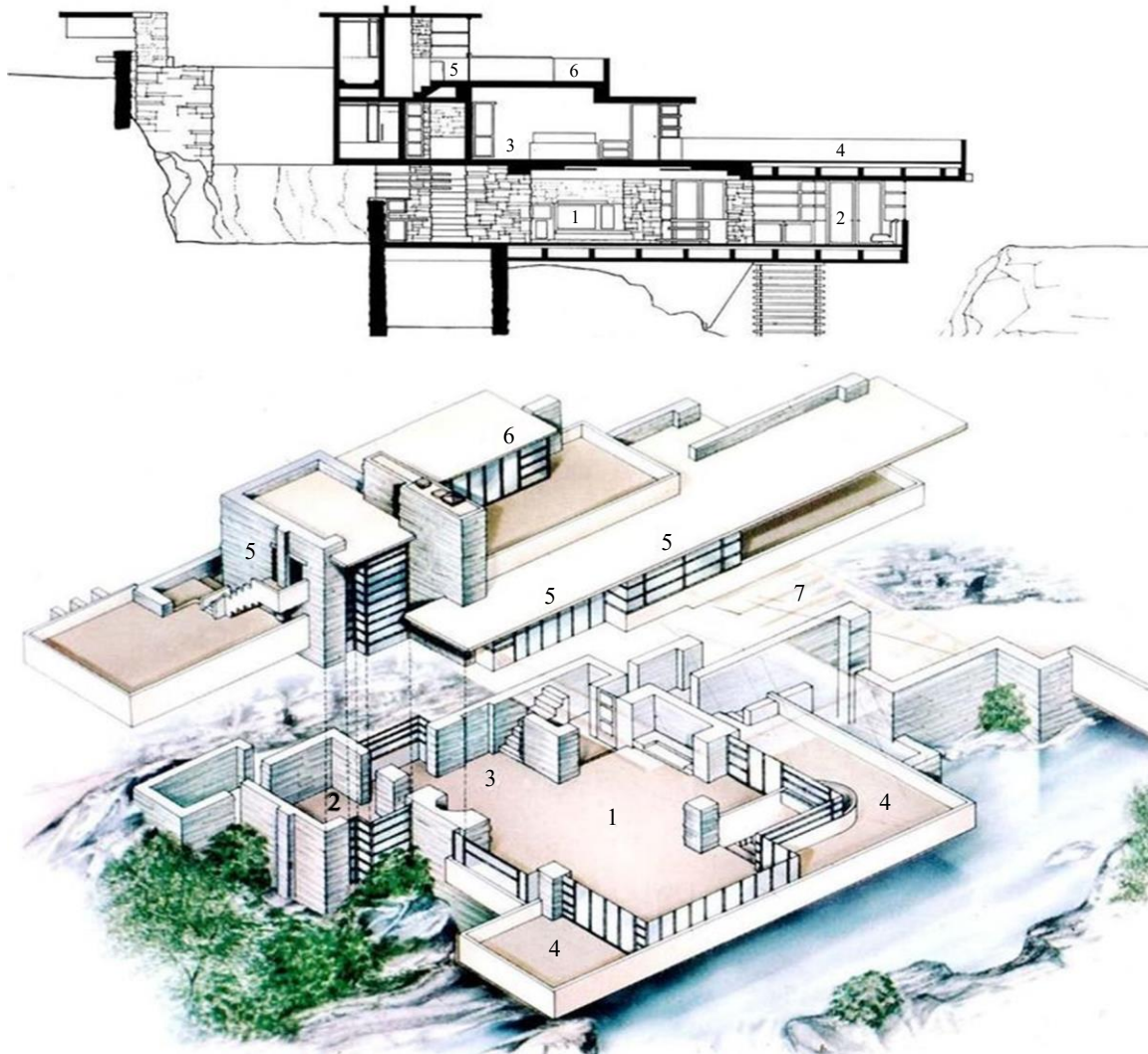


Figure 5. Isometric projection.



Figure 6. Showcasing the major elements which affect the experience of the user in space.

form and purpose. Villa Savoye is not only a home but also a manifesto of Le Corbusier's vision, demonstrating how architecture can enhance the experience of its inhabitants through thoughtful design [11].

Design Features

The Five Points of Architecture

1. *Pilotis (columns)*: The house is elevated on slender columns, freeing the ground floor for open use and allowing the landscape to flow beneath the structure. This creates an impression of lightness and openness, breaking the traditional relationship between building and ground.
2. *Free plan*: The interior layout is flexible, with walls serving as partitions rather than structural elements. This approach fosters fluidity and adaptability in the use of space.
3. *Roof garden*: The flat roof doubles as a garden terrace, compensating for the ground area occupied by the building. It enhances the connection to nature while integrating functional and aesthetic elements.
4. *Horizontal windows*: Ribbon-like windows provide expansive views of the surrounding landscape while allowing natural light to flood the interiors. This design emphasizes transparency and visual connection to the environment.
5. *Free facade*: The facade is liberated from structural constraints, enabling creative expressions of form and material (Figure 7) [12].

Integration with Nature

Villa Savoye is carefully positioned within its natural surroundings, emphasizing the continuity between the built and natural environments. The design blurs the boundaries between indoor and outdoor spaces, reinforcing the harmony between architecture and its setting [13].

Materiality and Color Palette

The use of reinforced concrete allows for clean, minimalist forms, while the white exterior conveys purity and modernity. This simplicity focuses attention on the spatial qualities of the structure (Figure 8).



Figure 7. Plan, Section and Elevation (Archi_Com & Archi_Com, 2023)

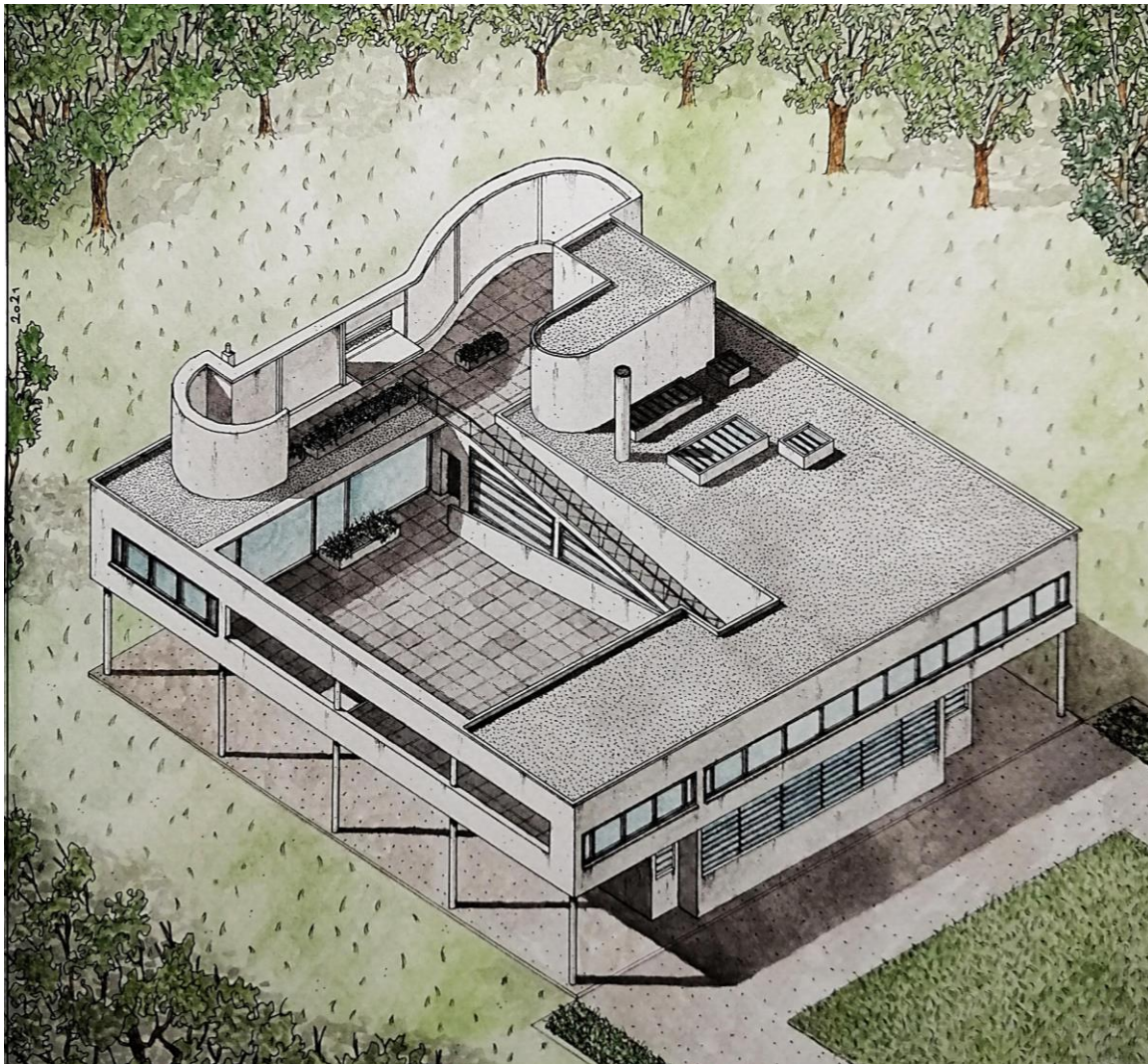


Figure 8. Showcasing the Integration with nature and The Materiality and Color Palette.

User Experience

Sense of Freedom

The open floor plan and expansive windows create a sense of spaciousness and liberation. Users experience unrestricted movement and a connection to the surrounding landscape, fostering relaxation and mindfulness.

Emotional Impact

The interplay of light, shadow, and open space generates a serene and contemplative atmosphere. The integration of natural elements, such as the roof garden, enhances feelings of calm and well-being.

Psychological Comfort

The clear, geometric forms and orderly layout reduce cognitive load, providing a sense of clarity and balance. This aligns with Le Corbusier's belief that simplicity and order contribute to mental harmony [14].

Architectural Innovations

Functional Modernism

Villa Savoye's design embodies the principles of functional modernism, prioritizing efficiency and adaptability over ornamentation. This approach has influenced countless architects, shaping the trajectory of 20th-century design (Figure 9).

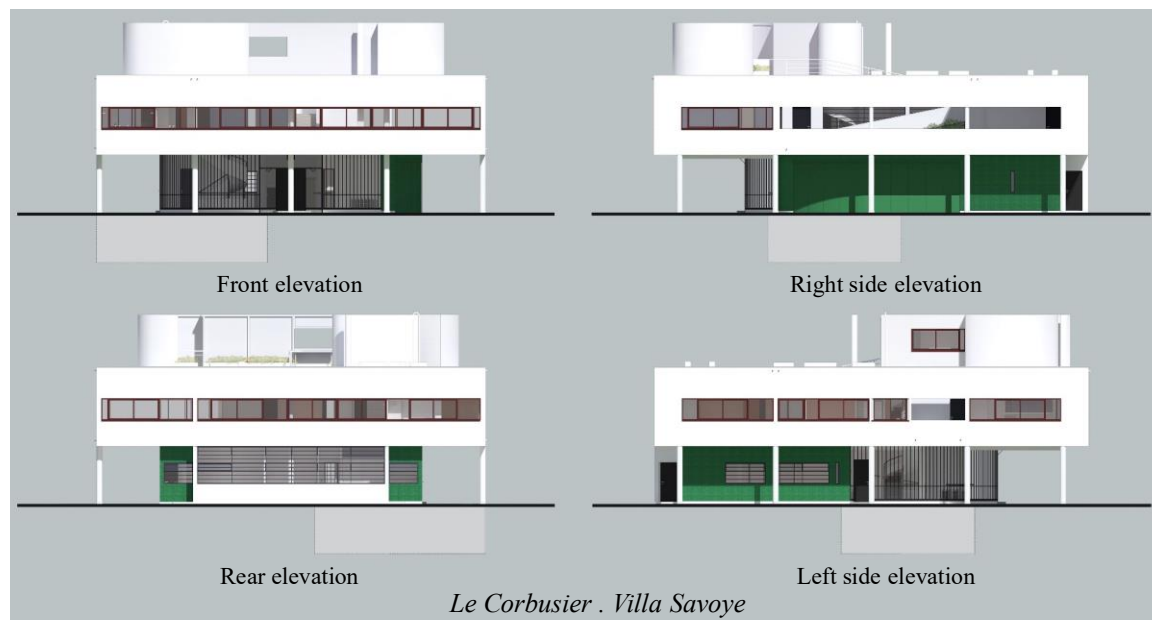


Figure 9. Villa Savoye Elevations, showcasing the ribbon windows, pilotis and the functional modernism (Villa Savoye (Le Corbusier) 1/250 by Dragonfly | Download Free STL Model | [Printables.com](https://www.printables.com), n.d.)

Elevating the Structure

By lifting the building on pilotis, Le Corbusier not only achieved aesthetic lightness but also improved practicality by creating shaded outdoor areas and minimizing the building's footprint on the site [15].

Ribbon Windows

The horizontal windows are a significant departure from traditional fenestration, providing panoramic views and enhancing the relationship between the interior and the natural world (Spence, 2020).

Relevance to Contemporary Design

Influence on Minimalism

Villa Savoye's emphasis on simplicity and functionality has inspired the minimalist movement in architecture. Its clean lines and open spaces remain a benchmark for modernist aesthetics.

Sustainable Design Principles

The roof garden anticipates contemporary concerns about sustainability by integrating green spaces into architectural design. This forward-thinking approach highlights the potential for architecture to coexist harmoniously with nature [16].

Supporting Research

- *Cognitive effects of simplicity:* Studies show that clear, minimalist spaces reduce mental fatigue and promote focus, aligning with the psychological impact of Villa Savoye's design.
- *Biophilic design:* The integration of green spaces and expansive views aligns with biophilic principles, emphasizing the restorative power of nature in architecture [17].
- *Perceptual harmony:* Research highlights the role of proportion and symmetry in creating calming environments, as seen in Villa Savoye's balanced layout.

Suggestions

Architecture holds profound power to shape human experience. By understanding the nuances of how design elements interact with user psychology, architects can create spaces that are not only visually

Table 1. Final conclusion and guidelines.

S.N.	Criteria	Majority	Minority	Conclusion
1	Tall walls in a room	Majority feels that the room is more open with tall walls rather than the usual or shorter height of the walls.	Few feel safe and some experts feel confined.	Utilise tall walls to create the space to be experienced as more open than usual.
2	Large windows in a room	Majority feels comfortable with having large windows.	Few feel large windows are inviting and too open.	Large Windows should be used to create a more comfortable space
3	High Ceiling in a room	Majority feels that high ceilings makes a space feel more spacious.	Few feel high ceilings makes a space feel overwhelming and some feel free when experiencing a space with high ceilings.	High Ceilings are to be used to allow for the space to feel more spacious
4	Width of Hallways	Majority feels that wide hallways makes one feel more comfortable	Few feel more tight and claustrophobic	Wide hallways to provide a Comfortable experience.
5	Type of seating affect your comfort in a space	Majority feels that couches provide a more relaxing and comfortable space.	Some feel that looking at chairs making a space feel more formal than it is intended to be.	Couches to be used to create a more relaxing space, whereas the chairs are to be utilised to create a formal setting.
6	Placement of seating	Majority feels when furniture is placed in an open seating format the seating arrangement then feels more social	Few feel when the furniture is placed near walls then the arrangement feels more private.	An open seating Format feels more social and when placed near walls the experience is more private.
7	Furniture arrangement of a room	The majority of the experts felt that when the seating in facing towards a view that makes a room feel more relaxing.	Few feel when the seating is facing towards each other the minority feels it to be more social.	The space is more relaxing when there is furniture facing towards a view of nature
8	Square rooms compared to round rooms	Majority feels more organized when experiencing a square room experts.	Some feels more comfortable in a round room.	Square rooms give off the feeling of being more organized.
9	Room with a view of nature	The majority feel more relaxed and connected to nature.	Some feel distracted when being placed in a room with a view of nature.	If the space has a view of the nature it feels more relaxing.
10	Classical style	The majority feel that the classical style makes the experience of a space feel more Formal And Grand.	Some feels that classic style of architecture makes the experience of a space feel more Organized and Calm.	This architecture style gives off the feeling of the space being more Formal And Grand.
11	Modern style	The majority feels that these components makes a space feel more Free and Open.	Some fee that the experience of the space provides more of an exposed feeling to the space.	It feels more Free and Open.
12	Industrial style	The majority feels that they experience the space to be more creative and energized.	Some feel the industrial style to be cold and unwelcoming.	This creates a creative space where one can feel energized and productive.
13	Traditional style	The majority of feels that the traditional style of architecture makes the space feel Cozy and Comfortable.	Some feel the space looks Old-Fashioned and Crowded.	This style creates a more Cozy and Comfortable space.
14	Minimalist style	The majority feel more calm and focused in a minimalistic space	Some feel that the minimalistic architectural style makes the user feel empty and the space appears to be 'too simple'.	This creates a more calm and focused experience of the space.
15	Which component majorly effects the experience of the space	While there were very varied answers but the majority answered with WINDOWS	While others thought that the either the furniture affects the room the most or the walls	Majorly the experts decided that the windows are the component which affect a space the most in terms of experience

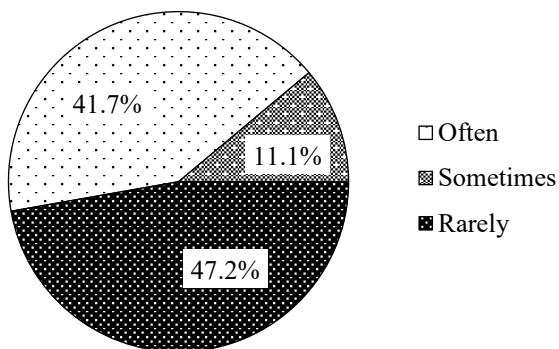
appealing but also emotionally resonant and functionally effective (Table 1). This study provides a foundation for future research into experiential architecture, emphasizing the importance of empathy and innovation in design practices. The ultimate goal is to inspire architects to think beyond form and function, focusing instead on creating environments that harmonize with human needs, emotions, and aspirations. Such an approach will contribute to the evolution of architecture as a transformative force in society.

DATA COLLECTION

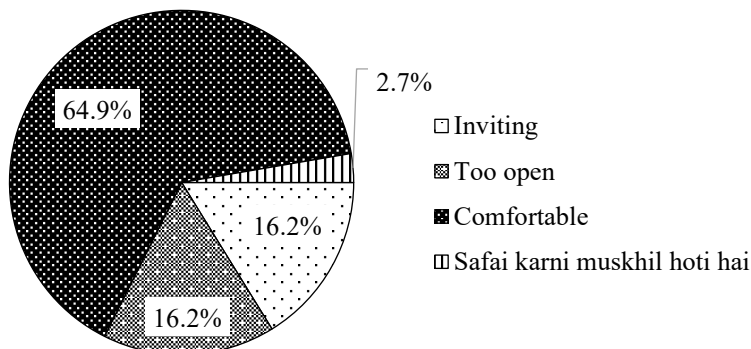
Expert Survey

This survey has been done to understand experts (architects) psychology at the time of designing.

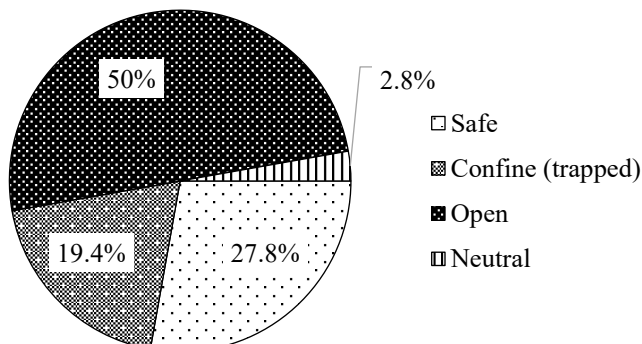
How often do you visit places like parks, museums, or offices?
36 responses



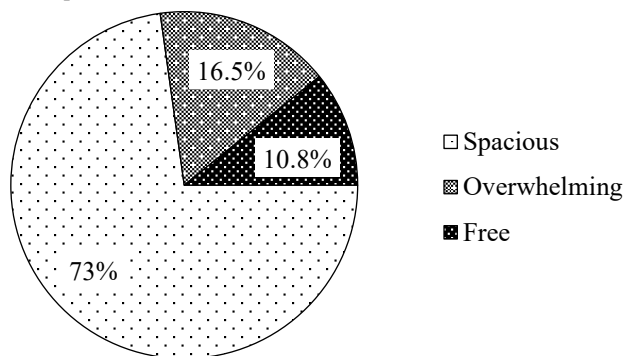
How do large windows affect your feelings in a room?
37 responses



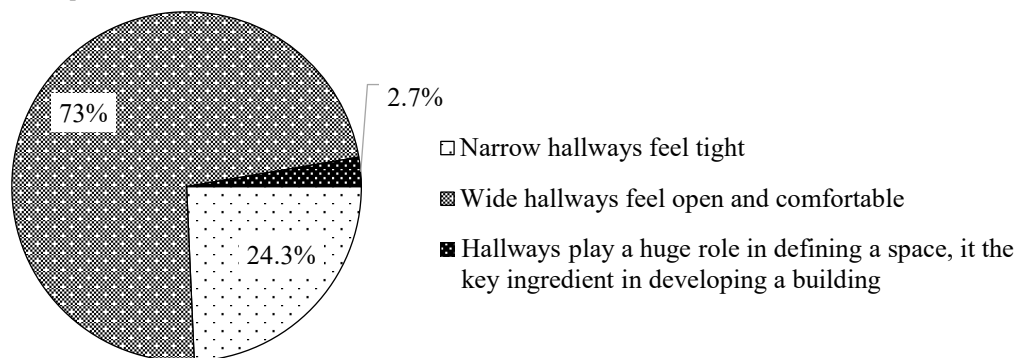
How do tall walls in a room make you feel?
36 responses



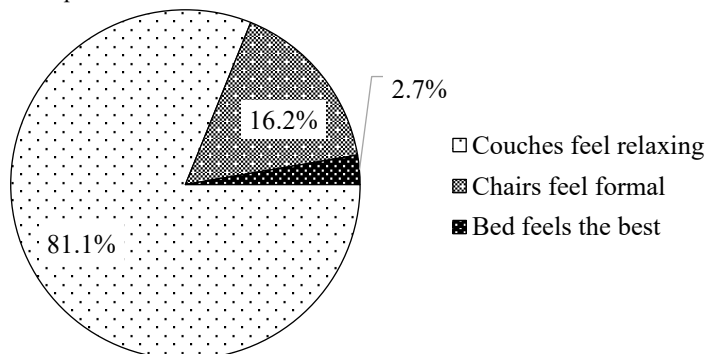
How do high ceilings make you feel?
37 responses



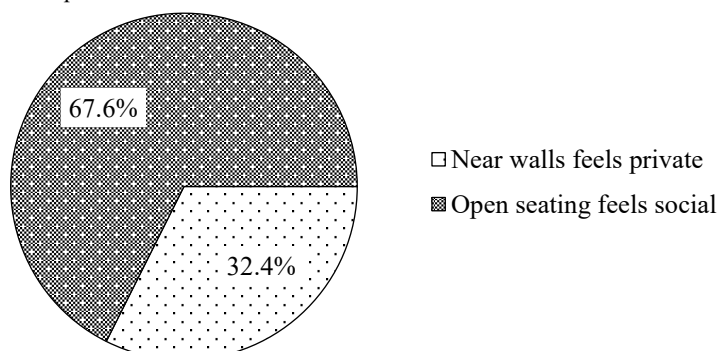
How does the width of a hallway make you feel when you through it?
37 responses



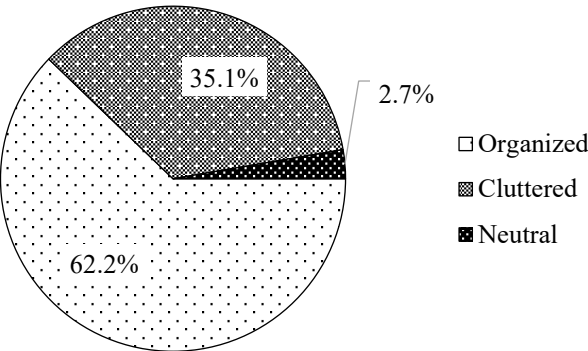
How does the type of seating (e.g., couches vs. chairs) affect your comfort in a space?
37 responses



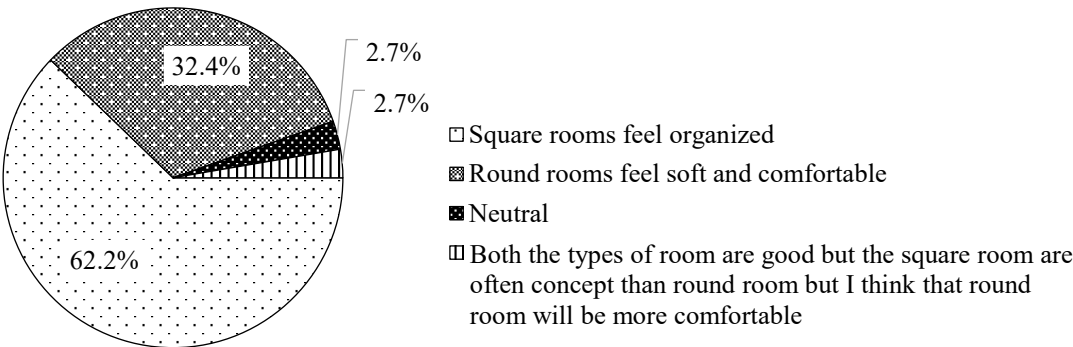
How does the placement of seating (e.g., close to walls vs. open) affect your comfort?
37 responses



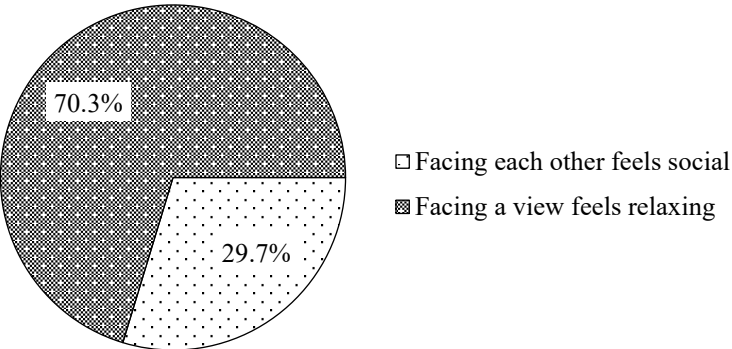
How do you feel about visible storage furniture (like cabinets or shelves) in a room?
37 responses



How do you feel in square rooms compared to round rooms?
37 responses

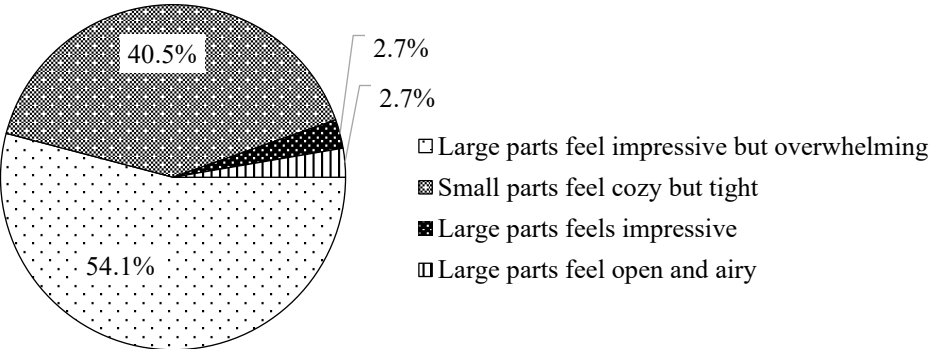


How does furniture arrangement (e.g., seating facing each other or toward a view) affect your comfort?
37 responses



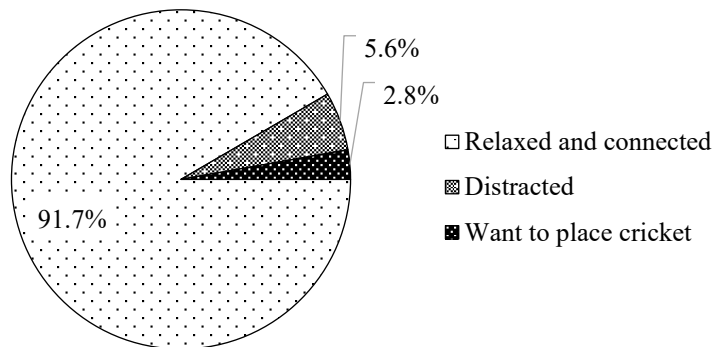
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How does the size of things like large windows or columns affect how comfortable you feel?
37 responses



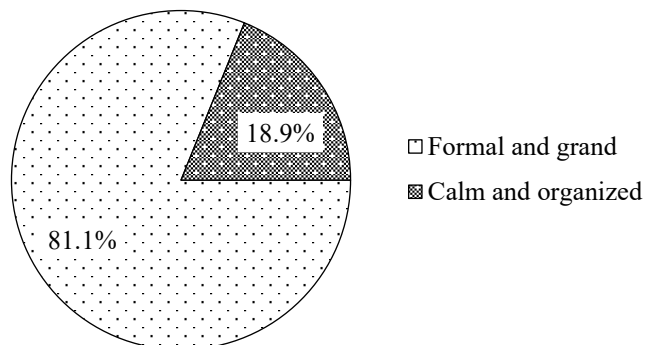
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How do you feel in a room with a view of nature (e.g., garden or park)?
36 responses

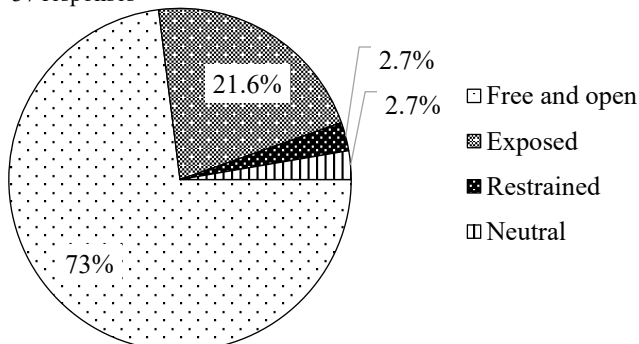


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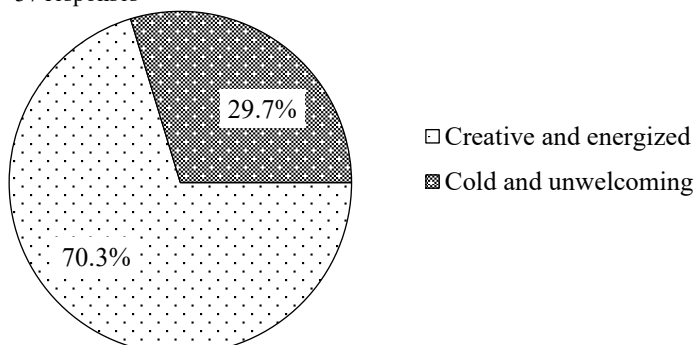
Classical style: How do columns and arches in classical-style buildings make you feel?
37 responses



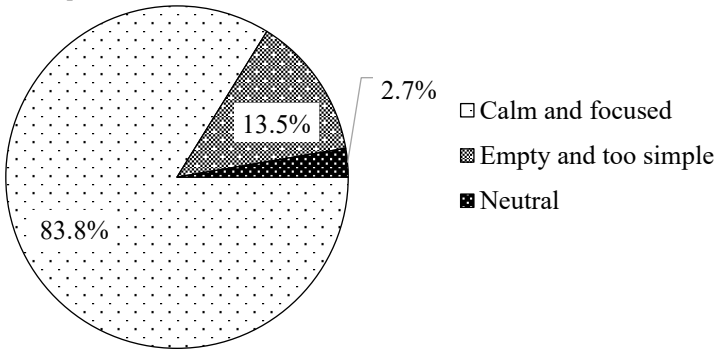
Modern style: Modern buildings often have open spaces and lots of glass. How do these features make you feel?
37 responses



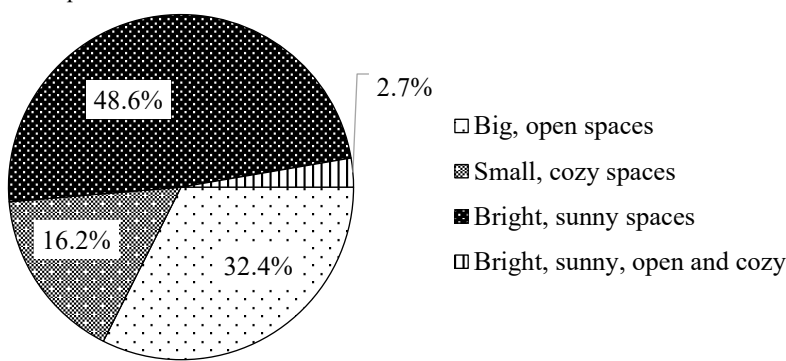
Industrial style: Industrial spaces often have exposed materials like metal and brick. How does this make you feel?
37 responses



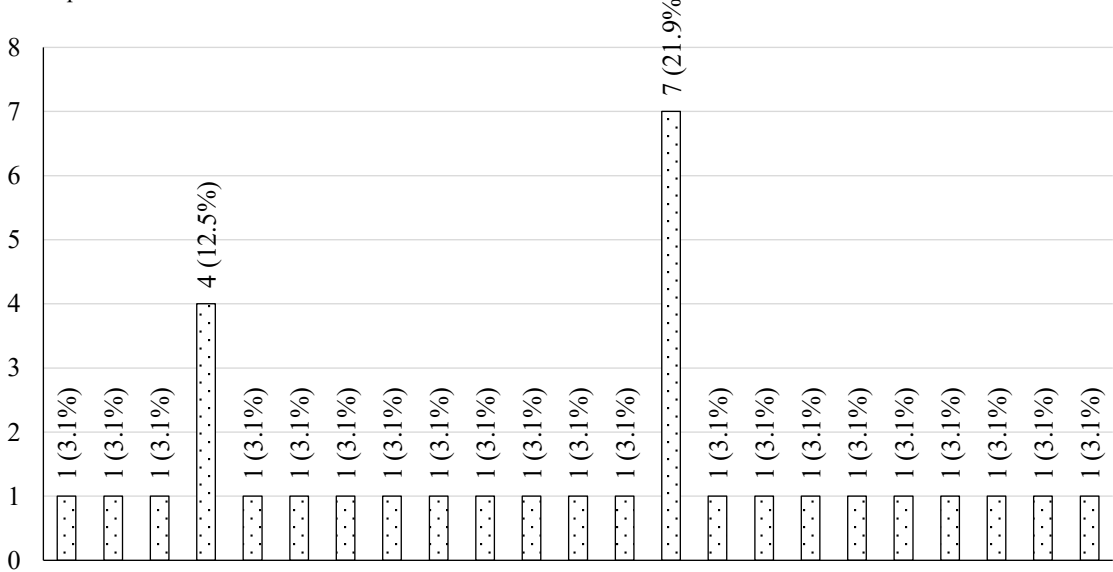
Minimalist style: Minimalist spaces use fewer items and neutral colors. How do you feel in a minimalist space?
37 responses



What kind of spaces make you feel the most comfortable?
37 responses



Which part of a building (walls, windows, furniture) do you think affects how you feel the most?
32 responses



CONCLUSION
This research aimed to explore the interplay between architectural elements and user experience, emphasizing the role of design in shaping physical and emotional responses to spaces. Through an examination of theoretical frameworks, case studies, and expert insights, the study offers guidelines for architects to create user-centered environments that enhance comfort, interaction, and functionality.

Summary of Findings

Architectural Elements and Emotional Impact

Various components such as walls, windows, ceilings, and furniture significantly influence user emotions. For instance, tall walls and wide hallways provide more openness, while large windows foster comfort and connection to the outdoors. High ceilings are perceived as spacious, and furniture placement directly affects feelings of privacy and sociability.

Influence of Design Styles

Distinct architectural styles, including classical, modern, industrial, and minimalist, allow for diverse emotional responses. Classical styles promote formality and order, while modern styles convey freedom and openness. Traditional materials like wood and stone are associated with warmth, whereas minimalist spaces offer focus and clarity but may also feel overly simplistic.

Role of Multisensory Design

The integration of sensory elements—light, texture, sound, and spatial geometry—emerges as a key factor in enhancing user experience. Multisensory engagement fosters deeper connections with space, reinforcing emotional, cognitive, and social well-being.

Psychological and Neurological Insights

Studies in neuroarchitecture highlight how architectural elements subtly influence mental states and memory. Features like coherence, fascination, and hominess were identified as pivotal in shaping pleasant experiences. These insights underline the potential for architecture to impact both psychological and physical health.

Recommendations for Practice

Holistic Design Approach

Architects should adopt a user-centric perspective, blending aesthetics with functionality to meet diverse emotional and practical needs. User feedback can be helpful during the design process to bridge the gap between intention and experience.

Application of Virtual Tools

Utilizing technologies like virtual reality and game engines can enhance spatial design processes by allowing architects to simulate and evaluate user experiences before implementation.

Guidelines for Component Utilization

Based on the research findings, a structured approach to selecting and manipulating architectural components can optimize user satisfaction. For example, integrating nature through large windows or biophilic elements can elevate relaxation, while varied textures and materials can enrich sensory engagement.

REFERENCES

1. Arckit, T. (2020, July 2). Tadao Ando's Church of the Light. *Arckit-US*. <https://us.arckit.com/blogs/news/tadao-ando-s-church-of-the-light>
2. Banaei, M., Hatami, J., Yazdanfar, A., & Gramann, K. (2017). Walking through Architectural Spaces: The Impact of Interior Forms on Human Brain Dynamics. *Frontiers in Human Neuroscience*, 11. <https://doi.org/10.3389/fnhum.2017.00477>
3. Chatterjee, A., Coburn, A., & Weinberger, A. (2021). The neuroaesthetics of architectural spaces. *Cognitive Processing*, 22(S1), 115–120. <https://doi.org/10.1007/s10339-021-01043-4>
4. Hodges, A. (2024, January 26). *A Guide to Guggenheim Bilbao's Iconic Design and Exhibits — a boy. a girl + a passport*. A Boy. A Girl + a Passport. <https://www.aboyagirlandapassport.com/travel/guggenheim-bilbao>
5. Kalra, A. K. (2020, June 25). *Villa Savoye: An architectural Sculpture - The Arch Insider*. The Arch Insider. <https://thearchinsider.com/villa-savoye-an-architectural-sculpture/>

6. Khaleghimoghaddam, N. (2022). Objective exploration of the effects of architectural components on users Spatial evaluation: a neuroimaging approach. *Iconarp International J of Architecture and Planning*. <https://doi.org/10.15320/iconarp.2022.209>
7. Nayak, A. V. (2023). New Directions for India's Architectural Education After Nep 2020.
8. Singh, M., & Avitesh, A. (2022). IMPACT OF PLANNING ON CULTURAL IDENTITY IN JAIPUR. *International Journal of Town Planning and Management*, 8(1), 55-66.
9. Avitesh, A. (2020). Black Architecture. *International Journal of Architecture and Infrastructure Planning*, 6(2), 36-40.
10. Avitesh, Naveen Nandal (2021). Psychology and Black Architecture. *PSYCHOLOGY AND EDUCATION* (2021) 58(5), ISSN 1553 – 6939
11. Jain, S., & Nayak, A. V. (2023). Impact of Color on Human Behavior Case–Interior Space. *Int. J. Emerg. Res. Eng. Sci. Manag*, 2(1), 33-37.
12. Jain, S., & Nayak, A. V. (2024). Millennial Needs and Aspirations for Emerging Housing Typologie. *Planning*, 10(1), 10-31p.
13. Messallam, O., & Fouad, S. S. (2018). Modernism's influence on Architect-Client Relationship: Comparative case studies of Schroder and Farnsworth houses. *Zenodo (CERN European Organization for Nuclear Research)*. <https://doi.org/10.5281/zenodo.1475018>
14. Slessor, C. (2020, July 16). *Guggenheim Museum in Bilbao, Spain by Frank O. Gehry & Associates - The Architectural Review*. The Architectural Review. <https://www.architectural-review.com/buildings/guggenheim-museum-in-bilbao-spain-by-frank-o-gehry-associates>
15. Spence, C. (2020). Senses of place: architectural design for the multisensory mind. *Cognitive Research Principles and Implications*, 5(1). <https://doi.org/10.1186/s41235-020-00243-4>
16. Zeghichi, H., & Mazouz, S. (2024). Methodological framework of the emotional dimension in the built space for an architectural quality. *Journal of Design for Resilience in Architecture and Planning*. <https://doi.org/10.47818/drarch.2024.v5i2123>
17. SONTAKKE, A. (n.d.). *Sensory Architecture: Designing for Multisensory Experiences - RTF*. Rethinking The Future. Retrieved October 2, 2024, from <https://www.rethinkingthefuture.com/architectural-community/a11049-sensory-architecture-designing-for-multisensory-experiences/>