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THE CONCEPT OF NEGATIVE SPACE IN ARCHITECTURE

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Abstract:

This paper examines the concept of negative space in architecture, with the aim of determining its structural, perceptual, and organisational roles within architectural composition. The study addresses the lack of a unified theoretical framework in which negative space is treated as an active architectural element rather than a residual by-product of form. The central hypothesis of the research is that negative space becomes architecturally meaningful only when it possesses clearly defined geometric boundaries, perceptual legibility, and an organisational role within the composition. These conditions enable its recognition as an active component of architectural structure. The paper develops a framework that integrates formal, phenomenological, and perceptual interpretations of the relationship between solid and void. The methodology relies on qualitative analysis of selected architectural examples, evaluated through criteria that distinguish three positional types of negative space: internal, peripheral, and external negative space. The findings confirm the hypothesis, demonstrating that negative space influences spatial hierarchy, visual clarity, and ambient qualities, and therefore operates as a formative principle rather than a passive absence. The study further identifies limitations of the concept, particularly in dense urban contexts and in culturally diverse models of spatial perception. These observations indicate the need for future empirical work focused on user perception and applied case studies. The paper thus provides a coherent basis for advancing methodological tools and for incorporating negative space more systematically into contemporary architectural design practice.

Key words*:* anti-space, void, architectural perception, spatial organisation.

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1. INTRODUCTION

Negative space is a term most commonly used in the visual arts, denoting the environment surrounding the elements of a composition or the space between them. Its presence becomes particularly evident when the arrangement of forms generates a recognisable contour or geometry of the void. In the visual arts, the primary function of negative space is to accentuate the figurative qualities of a composition through the contrast between solid and void, thereby contributing to its perceptual organisation. While many authors have employed this principle to articulate the relationship between figure and background, as exemplified in the works of Escher and Hantai, in the practice of certain artists, most notably Hasegawa Tōhaku, the void itself emerges as the central subject of investigation.

In a broader sense, the figure–ground principle extends beyond the visual arts and becomes relevant for understanding spatial perception in architecture. In the same way that the background in a painting influences the legibility of the figure, voids in architecture can define, direct, or emphasise the material structures that surround them. This analogy enables architectural composition to be understood as a system in which meaning arises not only from material elements, but also from the relationships produced by their absence.

In architecture, negative space is not merely an empty volume between masses but functions as a structural and perceptual component of composition. It may be experienced as an internal void at the core of a volume, as an interstitial zone along its perimeter, or as an external space mediating between the object and its wider context. This multiplicity of roles highlights the research potential of the concept.

In recent architectural discourse, negative space has increasingly been linked to openness, continuity, interstitiality, and the relationship between an object and its context. However, despite its broad usage, the term remains insufficiently defined in professional and scholarly literature, and its analytical value is rarely addressed systematically. This study examines the ways in which negative space manifests in architecture and identifies the conditions that enable its recognition as a constitutive element of architectural composition.

The primary aim of the research is to determine the spatial, morphological, and perceptual conditions under which negative space can be identified as a relevant conceptual category in architecture. The secondary aim is to analyse representative contemporary examples in which negative space appears in different positional configurations (internal, peripheral, and external), and to systematise its typologies on that basis.

Hypothesis: Negative space becomes an active component of architectural composition when the design structure fulfils a set of conditions that allow it to be clearly perceived and spatially distinguished. These conditions include geometrically defined or implied boundaries, a discernible difference in morphological or luminous characteristics relative to the surrounding context, and a positional role that enables its recognition as an autonomous spatial entity.

Definition: In this paper, negative space refers to a spatial unit that can be clearly distinguished within a composition, according to the following criteria: a) geometrically

defined boundaries; b) perceptual legibility in relation to adjacent masses; and c) a recognisable organisational role within the structure of the object or its context.

The research questions arising from the hypothesis focus on the following aspects:

1) How can negative space be identified and analytically described within architectural composition?
2) Which spatial and perceptual conditions enable negative space to become a constitutive element of architectural organisation?
3) How does the positional configuration of negative space (internal, peripheral, and external) influence its appearance and function?
4) To what extent does negative space contribute to the legibility, functionality, and organisational characteristics of an architectural work?

The answers to these questions are based on a qualitative analysis of architectural examples in which negative space is recognised as an active component of composition. The analysis combines morphological, perceptual, and phenomenological approaches, examining: 1) morphological characteristics (form, proportion, and boundaries); 2) perceptual parameters (light, contrast, and visual clarity); 3) contextual relations (relationship to surroundings, openness, and continuity); and 4) functional and semantic effects. Through a comparative analysis of representative examples, the study identifies the circumstances under which negative space transitions from a passive to an active element of architectural organisation.

This research establishes a theoretical framework that contributes to a more precise understanding of the concept of negative space, the conditions of its manifestation, and its potential for application in contemporary architectural analysis and practice.

2. PREVIOUS RESEARCH

The concept of negative space in architecture has its theoretical foundations in several disciplines, from Gestalt psychology and the visual arts to contemporary architectural theories of space and anti-space, from which its current understanding emerges through the interweaving of perceptual mechanisms of visual cognition, artistic figure–ground principles, and morphological approaches that interpret a void as an active component of architectural composition.

2.1. Gestalt principles of figure and ground

One of the fundamental principles of Gestalt psychology concerns the perception of the relationship between figure and ground as a unified whole. According to this theory, the human perceptual system organises visual stimuli by distinguishing figural elements, which attract attention, from background elements, which constitute a neutral field or void perceived as negative space (Lidwell *et al*., 2003).

Wagemans *et al*. (2012) provide a comprehensive overview of the century-long development of Gestalt psychology, with particular emphasis on the figure–ground principle as a primary mechanism of perceptual organisation. They affirm its continued relevance in contemporary research, as it explains how relationships between an object and its surroundings are formed, an essential aspect of understanding negative space in architecture (Wagemans *et al*., 2012).

Dresp-Langley and Reeves (2020) highlight Viktor Vasarely's contribution to understanding figure–ground perception through the use of colour and perceptual contrast. They demonstrate that the visual system interprets chromatic and luminance differences as indicators of spatial hierarchy, confirming that figure–ground perception depends on visual context rather than solely on geometric form. This is particularly pertinent to architecture, where the perception of solid and void is shaped by conditions of light and materiality (Dresp-Langley and Reeves, 2020).

In a subsequent study, Dresp-Langley (2019) quantitatively confirms that bilateral symmetry enhances figure–ground readability regardless of orientation or contrast level. These findings indicate that formal relations within a composition directly influence perceptual differentiation. In architectural terms, they explain why clearly articulated geometric relationships facilitate the identification of negative space as a distinct spatial entity.

Taken together, Gestalt research suggests that the recognisability of negative space in architecture depends on an interplay of geometric, luminous, and perceptual conditions, not merely on volumetric configuration.

2.2. Negative space in visual art and photography

Within photography, Suler (2013) defines negative space as any area the brain perceives as surrounding, between, or behind the subject, regardless of its content. He further argues that negative space may act as a perceptual buffer, offering relief from the density of the primary motif. This understanding emphasises the psychological dimension of negative space as an active participant in composing visual meaning, which also applies in architecture, where void acquires spatial and semantic presence.

Chuang *et al*. (2023) employ eye-tracking methods to examine how Gestalt principles influence visual perception and aesthetic experience in photography. They show that images with pronounced Gestalt attributes, such as closure or similarity, affect the viewer's focus and distribution of attention. Their findings confirm that perceptual organisation shapes the experience of negative space. In architecture, this implies that the arrangement of volumes, rhythm of openings, and light contrasts guide the perception of a void and contribute to its legibility.

Lange-Küttner and Vinueza Chavez (2022) study drawing techniques focused on negative space, directing attention to the areas around and between objects rather than to the objects themselves. They conclude that such methods shift perceptual focus and improve understanding of the full–void relationship, supporting interpretations of negative space as an active agent in both art and architecture. This approach demonstrates that negative space becomes perceptible only when sufficiently stable boundaries or visual anchors define it in relation to surrounding forms.

The common conclusion of these studies is that negative space is not a physical void alone but a perceptually constructed category dependent on the organisation of visual relations. Applied to architecture, this implies that negative space is recognised when certain perceptual conditions are satisfied – clarity of boundaries, perceptual contrast, and rhythm.

2.3. Architectural interpretations: space and anti-space

The figure–ground principle is equally present in architectural theory. Peterson (1980) argues that architecture consists of two fundamental elements: space, corresponding to

figure, and anti-space, corresponding to ground. Anti-space (negative space) is characterised as indeterminate, continuous, and open, while space (positive space) is enclosed, static, and structured. Peterson's contribution lies in recognising a void not as an absence but as an active component enabling formal intelligibility.

Cook (2007) expands this dichotomy, emphasising the interdependence of space and anti-space, and argues that the two elements generate spatial qualities that do not exist when considered independently. This viewpoint introduces the notion that negative space becomes architecturally relevant only when explicitly related to material structure.

Martínez Cuaresma *et al*. (2025) analyse processes of urban regeneration and adaptive reuse, demonstrating that empty urban sites are not passive remnants but potential generators of new functional and social environments, confirming the role of negative space as an active factor within spatial organisation.

Kuloğlu (2013) examines architectural and urban voids, arguing that masses and voids constitute fundamental spatial elements at both scales, and that void can define, guide, and emphasise spatial relations, thus becoming an operative factor in forming architectural and urban structures. Her approach provides a basis for linking negative space to its positional role within architectural structure – internal, peripheral, or external.

Bourque (2015) situates architecture within philosophical notions of the sublime and the negative, drawing on Kant and Adorno to interpret relations between space, aesthetics, and social context, and introduces the notion of negative architecture to describe how absence and void may assume reflective roles in contemporary spatial practice. Although philosophical, this perspective reinforces the understanding of negative space as conceptually relevant when it produces distinct experiential value.

Shivani (2016) emphasises that negative space is a constitutive part of all spatial compositions, enabling balance, functional clarity, and organisational coherence, and argues that negative space should not be interpreted as an unused void but as an active agent shaping relationships between volumes and material elements.

The shared premise of these authors is the understanding of a void as a functional and integral component of spatial organisation. While previous studies examined formal, perceptual, or contextual aspects individually, the present research approaches them as interdependent, examining situations in which geometric relations, lighting conditions, and spatial position collectively act as conditions for recognising negative space. These studies therefore form an integrated theoretical framework that combines perceptual, morphological, and spatial interpretations of void, drawing on a range of complementary architectural and spatial theories, and situating the concept of negative space within a broader disciplinary discourse, thereby providing the conceptual basis for analysing the circumstances under which negative space may be identified as a coherent category within architectural practice. The selection of references is therefore not exhaustive, but focused on those theoretical approaches most directly applicable to the analytical operationalisation of negative space within the scope of this study.

3. RESEARCH METHODOLOGY

The research methodology is based on a qualitative approach that combines morphological, comparative, and phenomenological analysis of architectural examples in which negative space is recognised as an active component of composition. The aim of this approach is not to quantify the phenomenon, but to understand it conceptually, perceptually, and spatially through different configurations and contextual conditions. Such a method enables examination of the interrelations between geometric properties, perceptual effects, and the organisational role of negative space, which aligns with the stated hypothesis.

The criteria for selecting case studies are based on three fundamental conditions required for the recognisability of negative space:

1) a clearly discernible relationship between solid and void within the architectural structure;
2) the presence of a void defined by material or geometrically implied boundaries;
3) an interaction between the object and its physical context that allows the void to be perceived as a distinct spatial entity.

On the basis of these criteria, a broader preliminary review of architectural examples from different typological and temporal contexts (residential, public, and sacral buildings, as well as selected urban spaces) was first undertaken in order to identify recurring positional patterns and underlying organisational principles of negative space. The final examples included in the paper were then selected through theoretical sampling as representative cases that most clearly illustrate the three identified positional types: internal, peripheral, and external negative space.

The analytical process comprises three complementary levels of investigation:

1) Morphological analysis, examining spatial relations, proportions, boundaries, and geometric characteristics of the void within the architectural composition;
2) Perceptual and phenomenological analysis, considering the influence of light, materiality, and perceptual contrast on the legibility of negative space within the architectural whole;
3) Comparative analysis, comparing the examples to identify patterns and conditions under which negative space acquires functional, organisational, or conceptual significance within the architectural configuration.

All three analytical segments apply a unified observation matrix that enables comparison and synthesis of results. On this basis, the classification into internal, peripheral, and external negative space is systematically established through the cross-analysis of spatial position, boundary conditions, and organisational role. The matrix includes: a) type of boundary; b) degree of perceptual legibility; c) position of the void in relation to the volume; d) functional and organisational consequences. Through their systematic cross-referencing, the transition from theoretical criteria to the classification into internal, peripheral, and external negative space is established. This ensures methodological consistency and the possibility of verifiable conclusions.

The aim of the methodological approach is to identify the conditions under which negative space can be recognised as a constitutive element of architectural composition through the analysis of space, its boundaries, and its contextual relations within a broader analytical corpus. The selected case studies serve as representative examples of

the identified positional types, providing a theoretical and analytical framework for its understanding and application in contemporary architectural analysis and practice. The method ensures a direct connection between the findings and the hypothesis. Each analysis considers how negative space affects the structural organisation, perceptual clarity, and ambient qualities of the architectural work according to the same set of analytical parameters, thereby enabling the procedure to be followed and replicated at the interpretative level.

Limitations of the methodology: The qualitative approach and theoretical sampling limit the potential for generalisation; and the operationalisation of criteria involves a degree of interpretative assessment inherent to qualitative spatial analysis. Accordingly, the findings should be understood as analytically grounded interpretations that provide a structured basis for further empirical verification through quantitative or experimental methods.

4. INTERNAL NEGATIVE SPACE

Internal negative space denotes a type of void formed within the volume of an architectural object, whose legibility is enabled by clearly defined material or geometric boundaries. In such cases, negative space does not function as an exterior intermediate zone, but as a central element of interior organisation, influencing the morphology, orientation, and perceptual legibility of the whole. This type of negative space emerges as the result of deliberate architectural articulation and possesses spatial characteristics that allow it to be recognised as an autonomous constructive category within the composition. In this sense, internal negative space is not merely a void within the mass, but a stable element of interior geometry that participates in shaping sequences, visual axes, and relationships among functional units.

In accordance with the methodological criteria, internal negative space in this study is defined as a geometrically stable and clearly bounded void exhibiting continuous boundaries, high perceptual legibility, and a recognisable organisational role within the interior structure of the object. Its identification rests on the degree of autonomy in relation to enclosed volumes and on the role it plays in establishing a spatial hierarchy. Such an approach enables negative space to be examined as an active mechanism of the internal structure, rather than as a formal outcome of subtracting mass.

4.1. House in Litoral Alentejano, Aires Mateus, 2000

In the House in Litoral Alentejano, designed by Aires Mateus in 2000, internal negative space is structured as a fragmented courtyard system that organises the interior geometry of the house (Figure 1). The square exterior form produces a clear and homogeneous volume, while its interior accommodates open and semi-open spaces of varying proportions (ArchDaily, 2016). This interior void is not a residual space, but the primary organisational element through which the hierarchy and legibility of spatial sequences are established. The courtyard negative space acts as a regulator of the composition, determining the rhythm of solid and void within the enclosed volume. Clearly defined boundaries, materially articulated on the outside and geometrically articulated on the inside, enable the courtyards to be perceived as a coherent spatial whole. It also affects the microclimatic conditions, daylight availability, and visual connections between rooms, confirming its organisational significance. This example shows that negative space becomes clearly identifiable when the criteria of geometric

stability, continuity of boundaries, and organisational function within the composition are met.

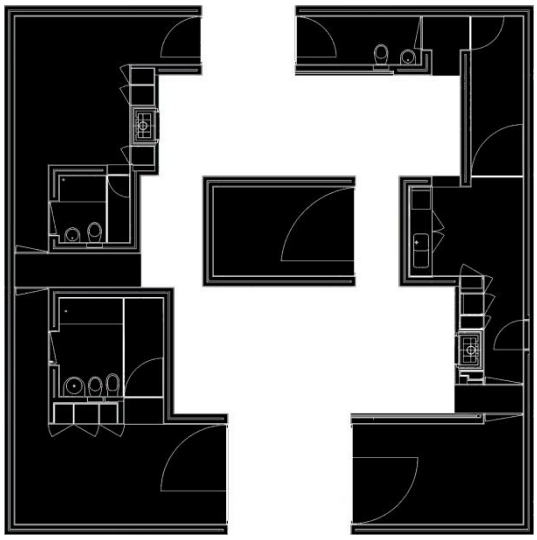

Figure 1. House in Litoral Alentejano, designed by Aires Mateus in 2000 (Source: Author's drawing based on publicly available photographic material)

4.2. Niyang River Visitor Center, Nyingchi, Zhaoyang Architects & Standardarchitecture, 2009

In the Niyang River Visitor Center in Nyingchi, completed in 2009, negative space emerges as an interior carved void within a compact stone volume (Figure 2). The exterior envelope is designed as a massive geometric form drawing on local building traditions, while the interior is organised around a central atrium and recessed openings (ArchDaily, 2014). This internal negative space is formed through a combination of material mass and light cuts, creating clearly perceptible boundaries. Spatial intervals produced by subtracting mass allow negative space to function as an active compositional element. Light contrasts and controlled openings articulate the continuity of the void, reinforcing its perceptual legibility even within a monolithic envelope. Moreover, the interior void acts as an orientational device, enabling intuitive visitor movement through the building and structuring its overall spatial logic. The analysis indicates that negative space becomes architecturally relevant when it is geometrically precise, materially distinct, and functionally integrated into the organisation of interior space.

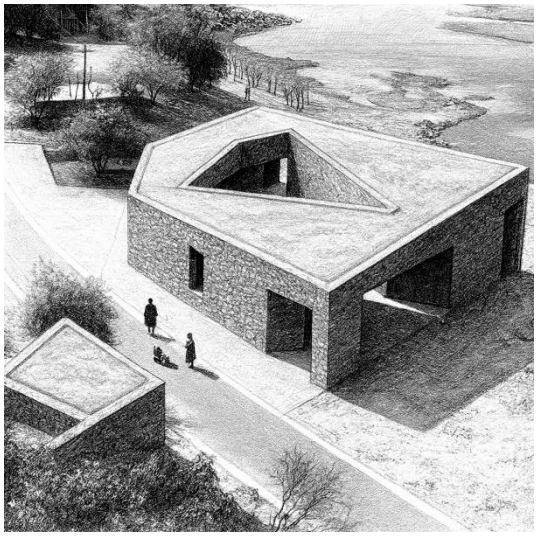

Figure 2. Niyang River Visitor Center, Nyingchi, designed by Zhaoyang Architects & Standardarchitecture in 2009 (Source: Author's drawing based on publicly available photographic material)

4.3. Villa beside a Lake, Go Hasegawa and Associates, 2023

In the project Villa beside a Lake, designed by Go Hasegawa and Associates in 2023, internal negative space takes the form of a central circular atrium that constitutes the core of the house's spatial organisation (Figure 3). Although open to the sky, the atrium is fully defined by its perimeter geometry and therefore belongs to the category of internal negative spaces (Hasegawa, 2025). The circular atrium functions as a geometric and perceptual reference around which residential units and circulation are arranged. Clearly articulated curvilinear boundaries ensure the perceptual legibility of the void in relation to the enclosed masses. The contrast between the open central zone and the fragmented periphery enhances the organisational role of the atrium. The central void also regulates lighting conditions by enabling vertical illumination and visual contact with the exterior, shaping the overall interior character. Hasegawa's approach confirms that negative space becomes methodologically recognisable when it simultaneously fulfils the criteria of geometric definition, boundary consistency, perceptual legibility, and organisational function, regardless of its formal expression.

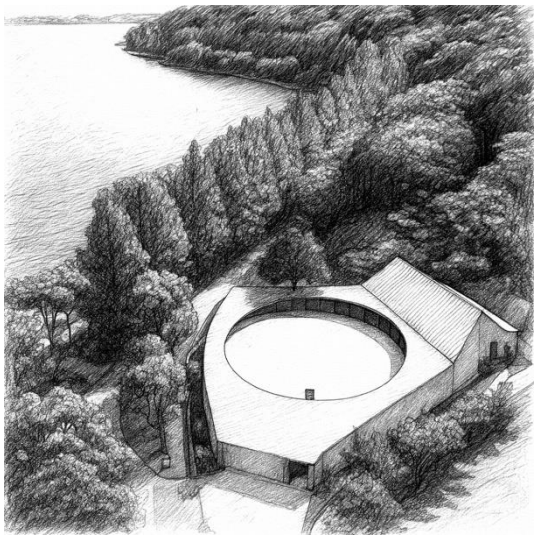

Figure 3. Villa beside a Lake, designed by Go Hasegawa and Associates in 2023 (Source: Author's drawing based on publicly available photographic material)

4.4. Comparative analysis of the examples

All three examples confirm that internal negative space becomes architecturally relevant when the void does not appear as a residual intermediate area, but as a stable and geometrically controlled spatial unit. Regardless of the type (courtyard system, carved mass, central atrium), a shared characteristic is the presence of continuous boundaries and high perceptual legibility. In all cases, negative space acts as a spatial regulator, structuring the relationship between solid and void, directing visual sequences, affecting the distribution of light, and reinforcing the organisational logic of the interior. These examples also confirm the methodological assumption that internal negative space can be identified only when the void possesses geometric stability, perceptual legibility, and an organisational role within the composition.

5. PERIPHERAL NEGATIVE SPACE

Peripheral negative space denotes a type of void formed at the boundary between an architectural volume and the external environment. Unlike internal negative space, which is fully contained within the mass of the building, peripheral negative space emerges as a spatial cut, recess, or hollowed segment articulating the transition between interior and exterior domains. Such spaces play a key role in defining the building's relationship to its context, as they enable perceptual, luminous, or functional distancing between the structure and its surroundings. At the same time, they can serve as mechanisms for redefining volumetric proportions, since the presence of a void at the perimeter influences how the mass of the building is perceived within its immediate setting.

In theoretical terms, peripheral negative space corresponds to the type of "intermediate space" which, according to Kuloğlu (2013), simultaneously belongs to and is separate from the architectural mass, thereby becoming an active regulator of the relationship between solid and void at the interface of the building and its context. For the purposes of this study, peripheral negative space is defined as a geometrically determined and spatially stable void positioned at the edge of the volume, whose perceptual distinctiveness results from clearly articulated material or geometric boundaries, and whose organisational function transforms the building's relationship to its external environment. Such spaces mediate between different ambient conditions and contribute to the formation of more complex perceptual regimes through the directing of views, the control of light, and the shaping of micro-environmental transitions. In the analysed examples, peripheral negative space does not operate as a decorative device, nor as a technical remainder, but as a primary morphological mechanism structuring the transition between interior and exterior space.

5.1. San Carlino Church, Lake Lugano, Mario Botta Architetti, 1999

A paradigmatic example of peripheral negative space is the San Carlino Church at Lake Lugano, completed in 1999, in which the void is conceived as a geometrically precise perimeter incision articulating the contour of a historical archetype (Figure 4). The negative space is positioned at the edge of the volume and functions as a clearly defined spatial unit due to its stable boundaries and strong light contrast (Shuangyu, 2019). The hollow carved into the compact cube possesses continuous boundaries, materially articulated external surfaces, and light-emphasised inner planes, ensuring high perceptual legibility. The contrast between the dark exterior cladding and the

illuminated internal surfaces defines the negative space as an autonomous spatial category, confirming that the absence of matter can assume an organisational role in the shaping of volume. This example also shows how peripheral negative space can reinterpret traditional forms: the void redefines the classical silhouette of the church and establishes a new visual relationship with the lakeside landscape. The analysis confirms that this type of negative space is architecturally relevant, as it satisfies the methodological criteria of geometric stability, clear boundaries, and organisational function in relation to the external context.

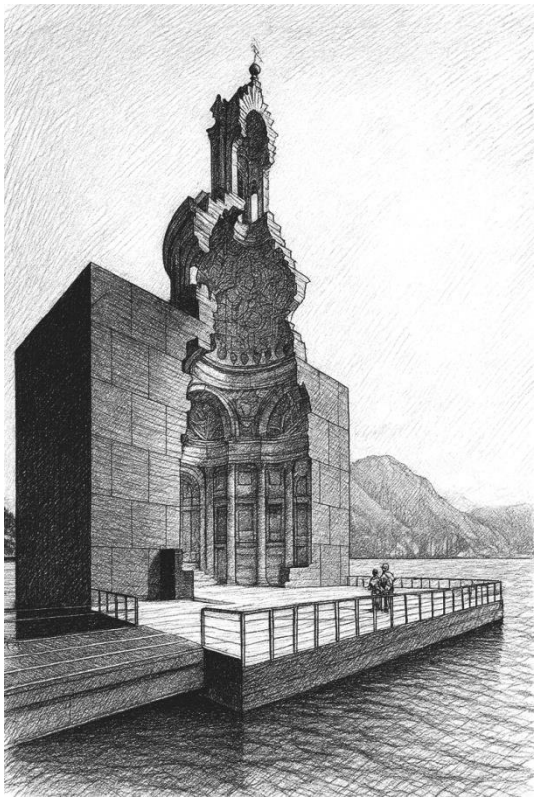

Figure 4. San Carlino Church, Lake Lugano, designed by Mario Botta Architetti in 1999 (Source: Author's drawing based on publicly available photographic material)

5.2. 0914 Flagship Store, Gangnam-gu, TRU Architects, 2017

In the 0914 Flagship Store in Seoul, the peripheral negative space is shaped as a carved void within the façade plane of a monolithic volume (Figure 5). The absence of material reveals the internal structure and introduces a strong contrast between the external homogeneous envelope and the interior finished in red brick (Abdel, 2020). The recessed geometry functions as a clearly defined spatial unit with stable edges and a high degree of perceptual legibility, confirming its classification as peripheral negative space according to the methodological criteria. This void acts as an organisational element, establishing a visual and functional link between the street and the interior, rather than serving as a decorative gesture. It also introduces ambient depth into the façade, integrating the building into the rhythm of the street frontage and enabling a gradual unveiling of the interior. The example confirms that peripheral negative space can be unequivocally identified even in dense urban conditions, provided its geometry, material contrast, and continuity of edges ensure stable perceptual legibility.

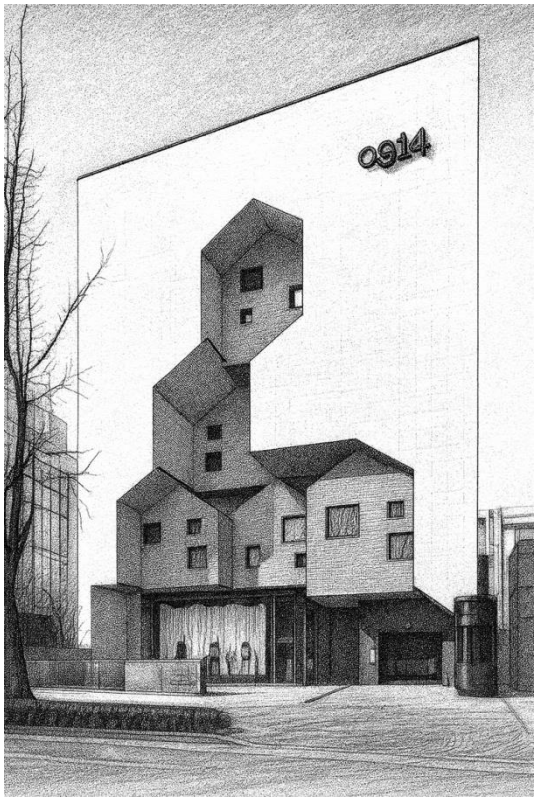

Figure 5. 0914 Flagship Store, Gangnam-gu, designed by TRU Architects in 2017 (Source: Author's drawing based on publicly available photographic material)

5.3. Faculty of Architecture, Tournai, Aires Mateus, 2017

In the project for the Faculty of Architecture in Tournai, the peripheral negative space is formed as a geometrically pure and precisely positioned spatial cut within a monolithic volume (Figure 6). This cut operates as a threshold mediating between external and internal domains, exceeding the function of a conventional opening (Vada, 2021). The void possesses clear geometric definition, boundary continuity, and high perceptual legibility, enabling its unambiguous recognition as peripheral negative space. Due to its boundary position, it assumes an organisational role in determining how the building is entered, traversed, and perceived. It also guides movement across the campus and frames views, confirming that peripheral negative space can generate effects beyond the immediate volume of the building. The example validates the methodological criteria: stable boundaries, geometric precision, and organisational function in structuring the transition between two spatial domains.

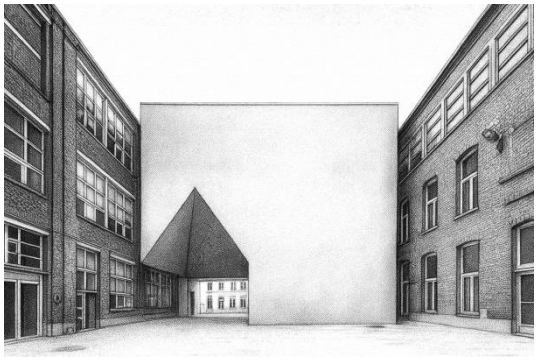

Figure 6. Faculty of Architecture, Tournai, designed by Aires Mateus in 2017 (Source: Author's drawing based on publicly available photographic material)

5.4. Whitney Museum of American Art, New York, Marcel Breuer, 1966

The Whitney Museum of American Art represents an early example in which peripheral negative space appears as an active layer mediating between architecture and the city (Figure 7). The negative space arises from the recession of the façade relative to the street line, producing a clearly defined and spatially stable intermediate zone (Sveiven, 2011). This interstitial layer has precisely defined boundaries: the massive stone volume on one side and the street space on the other. Perceptual legibility is achieved through controlled lighting, shadows, and material contrasts, enabling its identification as peripheral negative space. Breuer's strategy confirms that such a space may assume an organisational function in defining the building's relationship to the urban environment, as it introduces an ambient transition between public space and the architecturally controlled domain. The recessed façade also extends pedestrian flow and enables temporary gathering, giving the space the character of a micro-public environment.

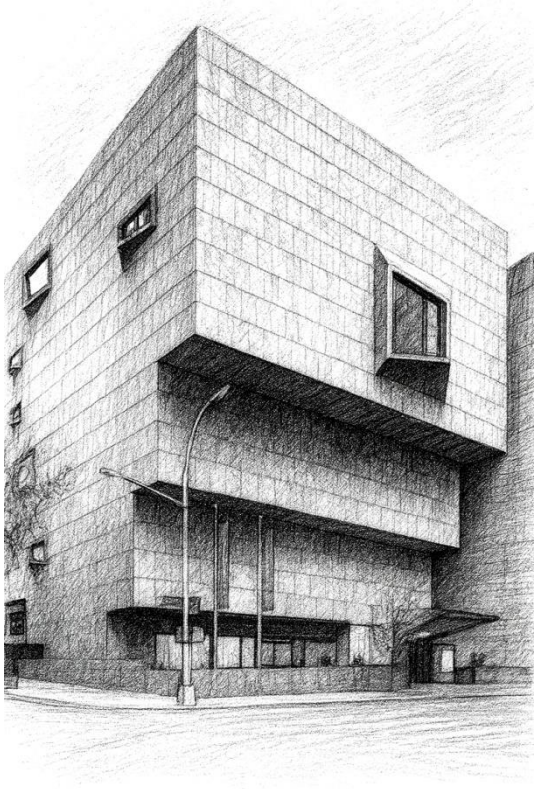

Figure 7. Whitney Museum of American Art, New York, designed by Marcel Breuer in 1966 (Source: Author's drawing based on publicly available photographic material)

5.5. Comparative analysis of the examples

The analysed examples demonstrate that peripheral negative space becomes architecturally relevant when the void is formed as a geometrically stable, clearly bounded, and perceptually distinct unit at the edge of the volume, rather than as a residual spatial remnant. Despite formal differences, ranging from a carved volume designed by TRU Architects, through a memory-inflected void by Botta, to a geometrically defined threshold by Aires Mateus, and an urban interstitial layer by

Breuer, shared characteristics include boundary continuity, geometric control, high perceptual legibility, and the structuring of transitions between interior and exterior domains. These examples further demonstrate that peripheral negative space can enrich the relationship between the building and its context, as the perimeter void becomes a spatial mediator shaping visual axes, patterns of movement, ambient depth, and the perception of mass. The examples confirm the methodological premise that peripheral negative space becomes a constitutive element of composition only when criteria of geometric definition, perceptual distinctiveness, and organisational function are fulfilled.

6. EXTERNAL NEGATIVE SPACE

External negative space denotes a type of void formed outside the architectural volume but in immediate relation to it, thereby becoming an active component in articulating the relationship between a building and its wider context. Unlike peripheral negative space, which appears at the boundary of a volume, external negative space operates on an urban, landscape, or ambient level, shaping visual axes, spatial flows, and perceptual regimes in the surroundings of an object. In theoretical terms, these spaces function as "urban voids" (Kuloğlu, 2013), capable of structuring the landscape and enabling the legibility of broader spatial sequences. Peterson's distinction between space and anti-space is particularly relevant here, since external negative spaces may be understood as anti-spatial frameworks: voids that do not belong to an individual building but become part of the city's broader spatial logic.

For the purposes of this study, external negative space is defined as a geometrically determined, spatially stable, and perceptually distinct void formed in the immediate environment of an architectural object, influencing the organisation of visual, ambient, and functional relationships. Such spaces may assume a regulatory role within a broader spatial-ambient system, as they affect movement patterns, ways of perceiving urban space, and the formation of public flows. They are not residual or accidentally generated gaps, but deliberately articulated spatial units with an active role in structuring urban and landscape settings. Additionally, external negative space may operate as an initiating element of an urban scenario, determining the relations between architecture, open space, and the broader urban structure.

6.1. Grande Arche de la Défense, Paris, Johann Otto von Spreckelsen, 1989

The concept of negative space as an organisational element of the surroundings is clearly expressed in the Grande Arche de la Défense in Paris, completed in 1989, where the monumental frame functions as a materialised void within the urban landscape (Figure 8). In this example, the negative space becomes part of the primary urban axis, with the void assuming an active role in structuring the city (Edwards, 2011). Spreckelsen shapes a monumental frame whose meaning relies on the absence of mass and on geometrically controlled boundaries rather than on an enclosed interior. The 112 m high void establishes the continuity of the historic axis from the Louvre, along the Champs-Élysées, to La Défense. The boundaries of the negative space are clearly defined by the regular geometry of the frame and light contrasts, ensuring high perceptual legibility. In this case, external negative space becomes a structural element of urban composition, enabling the perception of the city through a precisely framed visual corridor. The example confirms that external negative space may act as a carrier of

urban continuity and as a mechanism linking distant parts of the city into a single spatial sequence.

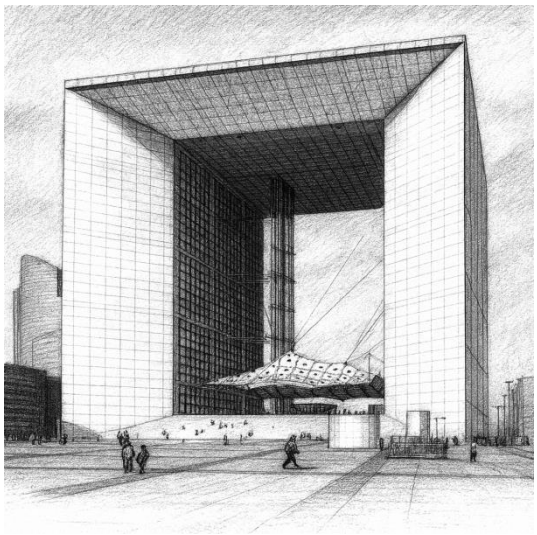

Figure 8. Grande Arche de la Défense, Paris, designed by Johann Otto von Spreckelsen in 1989 (Source: Author's drawing based on publicly available photographic material)

6.2. House N, Oita, Sou Fujimoto Architects, 2008

The layered character of external negative space is evident in the House N project in Oita, completed in 2008, where the basic volume of the house is enveloped by an outer shell forming a clearly defined intermediary space between the architecture and its context (Figure 9). In this project, external negative space is created between three successive layers of spatial organisation, with the intermediary zone functioning as the primary living environment rather than as a secondary area (ArchDaily, 2011). The geometry of the external negative space is defined by wall perforations, varying heights, and roof openings, establishing a stable perceptual sequence. The external negative space produces a gradual transition between public and private, introducing controlled transformations of light, views, and movement. This example demonstrates that external negative space may also be integrated into an intimate residential context, where it assumes the role of mediator between the private home and the external environment. It further shows that, beyond urban applications, external negative space can operate as a micro-ambient regulator, generating a specific spatial identity even at a small scale.

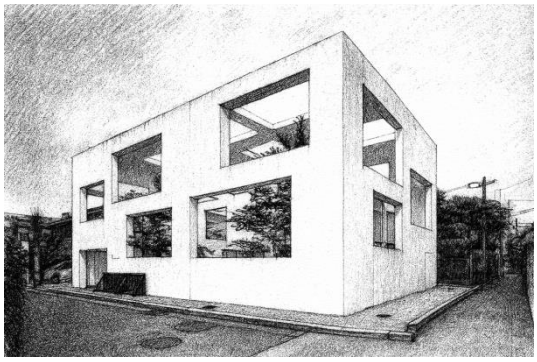

Figure 9. House N, Oita, designed by Sou Fujimoto Architects in 2008 (Source: Author's drawing based on publicly available photographic material)

6.3. MÉCA Cultural Centre, Bordeaux, BIG + Freaks, 2019

In the MÉCA Cultural Centre in Bordeaux, external negative space is defined as a monumental carved void within a compact volume, becoming a key element in organising the relationship between the building and the city (Figure 10). This spatial incision forms a large public plateau and ramp that act as a transition between the city's riverfront and the cultural district (Walsh, 2019). The boundaries of the negative space are delineated by sharply cut surfaces that provide geometric precision and perceptual stability. Unlike the Grande Arche, where the negative space primarily performs a visual function, in MÉCA it acquires the role of an active public space. Visitors experience the building through movement along the ramp and staircases, with the negative space assuming an organisational function in structuring public life. The example demonstrates that external negative space can operate as a public environment that physically, visually, and socially connects different parts of the city. At the same time, the carved void alters the perception of mass, making the building spatially permeable and open to its surroundings.

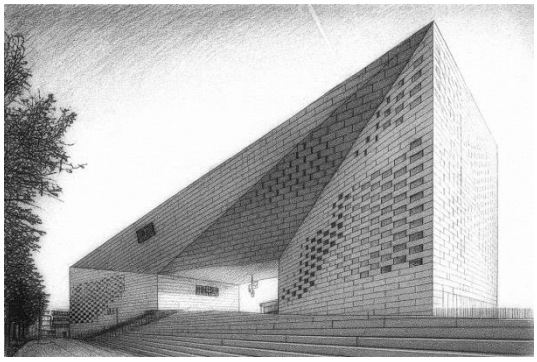

Figure 10. MÉCA Cultural Centre, Bordeaux, designed by BIG + Freaks in 2019 (Source: Author's drawing based on publicly available photographic material)

6.4. Comparative analysis of the examples

The analysis of *Grande Arche de la Défense*, *House N*, and *MÉCA* shows that external negative space becomes architecturally relevant when it meets the following criteria: clear geometric definition, boundary continuity despite the open context, perceptual stability, and organisational function. In the first example, external negative space operates as the supporting element of an urban axis; in the second, as a layered micro-context of residential architecture; and in the third, as an activated public space integrated into the wider urban system. Despite differences in scale and purpose, the shared characteristic is that negative space becomes a mechanism of spatial organisation, structuring visual flows, ambient transitions, and patterns of movement.

The analysis of internal, peripheral, and external negative space demonstrates that these types differ according to their position in relation to the building volume, the type of geometric articulation, and their organisational function within architectural composition. Internal negative space operates as a stable and geometrically controlled void within the mass, establishing internal hierarchy. Peripheral negative space appears at the boundary of the volume and functions as an intermediary zone transforming the relationship between the object and its immediate context. External negative space is formed in urban or landscape settings and influences the organisation of visual flows and public environments. In all three cases, the identification of negative space is based on the criteria of geometric definition, stable boundaries, perceptual legibility, and

organisational function. This typology provides the basis for further discussion on the theoretical implications and operational possibilities of the concept of negative space in contemporary architectural practice.

7. DISCUSSION

The analytical part of the study demonstrates that negative space may be defined more precisely when its geometric, perceptual, and organisational dimensions are interpreted as interdependent parameters. Together, these parameters determine how negative space is identified, understood, and evaluated within architectural composition. The differentiated typology (internal, peripheral, and external negative space) makes it possible to observe voids as a complex category. Their characteristics change depending on their position in relation to the building volume, while relying on the same fundamental methodological criteria. In this sense, the findings align with broader theoretical debates that associate negative space with aesthetic and philosophical concepts of absence and the sublime (Bourque, 2015).

A comparison of the examples within the three typological groups confirms that the function of negative space depends on its position. Internal negative space operates within a closed material mass and affects the hierarchy and legibility of interior sequences. Peripheral negative space shapes the transition between the architectural volume and its immediate context, influencing perceptual regimes of viewing the object. External negative space operates on a broader urban or landscape scale, shaping visual axes, spatial sequences, and public flows. This range of operations shows that negatively defined spatial units possess the capacity to act across different spatial levels, consistent with research attributing a role in structuring landscapes and public environments to urban voids (Kuloğlu, 2013; Martínez Cuaresma *et al*., 2025).

The findings also nuance existing theoretical models. Peterson (1980) primarily interprets negative space as a counterpoint to material mass, whereas Kuloğlu (2013) highlights its ambivalent relationship to the volume, a perspective further discussed by Cook (2007). The results of this study indicate the need for a more systematic differentiation of types of voids, based on the criteria of geometric stability, boundary continuity, and perceptual distinctiveness. These three criteria provide a consistent analytical basis for classifying different manifestations of negative space, thereby reducing terminological and interpretative ambiguity in the literature. In this context, conclusions drawn from Gestalt theory are particularly relevant, confirming that perceptual grouping, contrast, and clearly defined contours directly influence figure–ground separation and, consequently, the legibility of the void (Wagemans *et al*., 2012; Dresp-Langley, 2019; Dresp-Langley and Reeves, 2020).

The analysis further suggests that negative space contributes concretely and operationally to the legibility of architectural composition. In internal configurations, it acts as a regulator of spatial hierarchy; in peripheral settings, as an instrument for articulating boundaries and establishing relationships between mass and void; and in external environments, as a mechanism structuring urban sequences and public flows. These considerations confirm that negative space is not a static category but a variable instrument of perceptual and spatial organisation within architecture.

It is particularly significant that the observed patterns correspond with empirical research on perception, including studies of bilateral symmetry, light contrast, and

visual guidance (Dresp-Langley, 2019; Chuang *et al*., 2023). Additionally, research on spatial representation in drawing and photography indicates that modes of visual depiction influence the identification of negative intervals (Lange-Küttner and Vinueza Chavez, 2022; Suler, 2013). Such findings confirm that perceptual criteria have a legitimate role in the architectural analysis of negative space.

The limitations of the study relate to its qualitative approach and selective corpus of examples, which restrict the capacity for generalisation. Furthermore, the perceptual characteristics of negative space have not been empirically tested through user experience, representing an avenue for methodological improvement. Nonetheless, the observed coherence between theoretical, morphological, and perceptual parameters confirms the relevance of the analysed concept and opens possibilities for its further development.

Overall, the discussion confirms that negative space is an analytically productive and theoretically significant category. Its understanding can be systematically advanced by integrating geometric, perceptual, and organisational criteria. In doing so, it establishes a foundation for the more consistent application of the concept in architectural theory and design practice.

8. CONCLUSIONS

The aim of this research was to clarify the concept of negative space in architecture and examine its analytical and theoretical value. This was achieved by differentiating three typological forms: internal, peripheral, and external negative space. The analysis of the selected architectural examples supports the initial hypothesis, indicating that negative space can be identified and interpreted through the interaction of geometric, perceptual, and organisational criteria. Given the qualitative and illustrative character of the analysed sample, the conclusions should be understood as typological and interpretative rather than statistically generalisable. The results further indicate that this interaction enables an analytical understanding of negative space as a stable and functionally relevant spatial entity.

Synthesis of the findings demonstrates clear distinctions between the three types of negative space. Internal negative space operates within the volume and influences the hierarchy of interior sequences. Peripheral negative space forms at the junction of the object and its context, participating in the visual articulation of boundaries and the perception of the volume. External negative space functions within a wider urban or landscape environment, influencing the organisation of visual directions, public flows, and spatial-ambient sequences. The identification of these differences indicates that negative space can be understood not as a single phenomenon, but as a set of spatially defined entities whose functions change depending on their position within a composition.

The contribution of this research lies in establishing a theoretical and analytical framework that enables a more precise definition and classification of negative space in architecture. The criteria of geometric stability, boundary continuity, and perceptual distinctiveness have proven to be a reliable basis for analysis. A differentiated approach to negative space reduces terminological ambiguity in existing literature and enables a more consistent interpretation of voids as constitutive elements of architectural composition. The findings also indicate that negative space has operational potential as

a design tool, influencing the legibility, organisation, and contextual integration of architectural units.

The limitations of the study relate to the qualitative nature of the sample and the absence of empirical data on user perception. Future research should incorporate experimental methods of examining visual attention, comparative studies of perception, and quantitative analyses of typological variants of negative space. Further development of the concept may also be directed towards the analysis of specific programme typologies, the regeneration of urban voids, and the application of digital tools for spatial evaluation.

Overall, the research confirms the significance of negative space as an analytical and design category and demonstrates that its systematic understanding can contribute to a more precise interpretation of architectural composition and its relationship to context.

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