

Beyond green cosmetics: Repositioning biophilic architecture through relational spatial form

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ARTICLE INFO	ABSTRACT
<i>Article history:</i> Received June 22, 2026 Received in revised form July 22, 2026 Accepted August 18, 2026 Available online September 01, 2026 <i>Keywords:</i> Architecture Biophilic Embodied experience Relational spatial form Relational structure of space	<i>Over the past several decades, the notion of biophilic design has become increasingly prominent within both architectural scholarship and professional practice. Nevertheless, its implementation is frequently confined to the incorporation of vegetation, natural materials, daylight, and other visually perceptible characteristics associated with the natural environment. Consequently, biophilic design is commonly interpreted as a form of green aesthetics or as an approach to creating visually tranquil environments, whereas deeper architectural understandings of how human beings encounter and inhabit space as a place of dwelling remain comparatively underdeveloped. In addition, the majority of existing biophilic design research has emerged from the disciplines of biology, environmental psychology, and health sciences, emphasizing physiological and psychological responses to natural environments rather than examining the spatial configurations through which such experiences are constructed and mediated. This article seeks to reconceptualize biophilic design within the architectural discipline by approaching it through the ontological understanding of architecture as a place of dwelling. To accomplish this objective, the discussion foregrounds the theory of Relational Spatial Form (RSF) together with its operational framework as a means of interpreting and applying biophilic principles in architectural design. This article contends that, from an architectural standpoint, the essence of the biophilic experience is not fundamentally generated by the mere presence of natural elements as visual artifacts. Instead, it is constituted through the relational organization of space, which establishes orientation, spatial transitions, hierarchical relationships, and the conditions that enable meaningful dwelling. From this perspective, natural elements undoubtedly contribute to enriching the quality of spatial experience; however, they do not serve as the principal factors governing the organization of use or the lived experience of inhabitation. Accordingly, biophilic design should be more appropriately understood as an emergent spatial quality that operates upon an already established framework of inhabitation through the relational structure of architectural space.</i>
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Introduction

Over the past several years, concepts such as *healing architecture* and *wellness architecture* have become increasingly influential within architectural discourse. These approaches are frequently associated with ideas of *green design* and *restorative environments* (Zhong, Schröder, and Bekkering 2022; Tekin, Corcoran, and Gutiérrez 2023). Consequently, numerous architectural projects have embraced vegetation, abundant daylight, water features, and naturally textured materials, including timber and stone, to create environments characterized by lush visual qualities and promoted through the promise of providing "calming spaces." Alongside these developments in architectural practice, the concepts of *biophilic design* and *biophilic architecture* have gained significant prominence within theoretical discussions. In general, these concepts describe built environments that are believed to promote healthier living conditions while enhancing users' physical and emotional well-being through a closer relationship with nature (Kellert and Calabrese 2015; Salingaros 2015; Richards 2018).

The expanding acceptance of biophilic design within architecture gives rise to two fundamental questions. First, does biophilia occupy an ontological position within architecture as an essential dimension of human dwelling, or is it primarily confined to the domains of visual aesthetics and atmospheric expression? Second, can biophilic design genuinely transform the experience of inhabitation? A building may contain extensive greenery and present an atmosphere that appears tranquil and nature-oriented while simultaneously producing physical exhaustion and psychological discomfort as a consequence of confusing wayfinding systems, disordered circulation, unclear spatial hierarchies, excessive exposure, and the absence of protected places where occupants can pause, recover, and regain comfort (Lynch 1960; Hillier and Leaman 1976; Gehl 2011). Under such circumstances, simply introducing vegetation into an architecturally oppressive environment does not necessarily improve the lived experience of dwelling. Rather, this condition prompts a more fundamental inquiry into whether biophilic qualities should be understood through the mere incorporation of natural elements or through the capacity of spatial organization to facilitate

meaningful and embodied habitation (Norberg-Schulz 1980).

This line of reasoning indicates that the principal architectural problem may not stem from the lack of natural components within the built environment, but instead from the relational organization of space itself. It is important to recognize that the concept of *biophilia* did not originate within architecture but was initially introduced by a biologist. Although the concept has subsequently been incorporated into architectural discourse and design practice, the majority of biophilic research continues to be grounded in biological sciences, environmental psychology, and health-oriented investigations (Kellert and Wilson 1993; Richards 2018; Xue et al. 2019; Zamri and Ahmad 2025; Usip, Essien, and Ema 2026). Comparatively little attention has been devoted to interpreting biophilia from an architectural perspective. Moreover, few scholarly efforts have attempted to examine biophilia while preserving dwelling as the fundamental ontological basis of architecture. Consequently, the relationship between biophilic design and architecture's essential purpose, namely, creating spatial conditions that enable meaningful human inhabitation, remains insufficiently conceptualized within current architectural theory.

Addressing this theoretical gap, the present study seeks to reposition the concept of biophilic architecture through the theoretical framework of Relational Spatial Form (RSF) together with the operationalization of embodied spatial experience (Salura 2026a). This study argues that biophilic experience is not generated solely through the presence of natural objects; rather, it emerges principally from the manner in which spatial relationships are organized and encountered by the human body. From this standpoint, architecture does not directly produce biological healing. Instead, it serves as a spatial medium through which orientation, transition, rhythm, protection, retreat, and human engagement with the natural environment are structured and experienced. Accordingly, the biophilic quality of architecture should be evaluated not only according to the quantity of natural elements incorporated within a space, but also according to the extent to which its spatial configuration supports meaningful, restorative, and embodied patterns of inhabitation. Through this theoretical repositioning, biophilia is understood not merely as the integration of nature into architectural

design, but as a relational mode of spatial organization that mediates the interaction between the human body, architectural space, and the natural environment.

The contribution of this study is articulated across three interconnected dimensions. At the theoretical level, it advances a reinterpretation of biophilia by shifting its emphasis away from the notion of "green aesthetics" toward a relational architectural understanding grounded in the ontology of dwelling. At the conceptual level, it introduces Relational Spatial Form (RSF), together with its operational framework, as an architectural lens through which biophilic experience can be interpreted based on spatial relationships. At the methodological level, it proposes an analytical framework capable of distinguishing superficial applications of biophilic design from approaches that are fundamentally integrated into the experiential structure of architectural space. Through these contributions, the study extends contemporary discourse on biophilic architecture beyond the visible presence of nature toward the deeper relational structures that shape embodied human dwelling.

The findings of this study also offer practical contributions to architectural design by critically reinterpreting the concept of biophilia, which has frequently been reduced to little more than a fashionable design slogan. In many contemporary applications, biophilic design risks becoming a form of *green cosmetics*, where visual expressions of nature are prioritized without producing meaningful changes in the spatial conditions that support inhabitation. Although it is relatively straightforward to argue that "biophilic design is not synonymous with green cosmetics," the more significant challenge lies in moving beyond such criticism to establish an operational framework capable of informing and improving architectural practice. This study responds to that challenge by developing a conceptual and analytical framework through which biophilic qualities may be evaluated and incorporated at the level of spatial experience rather than through the superficial addition of natural elements alone.

Methods

Materials

This research adopts a theoretical approach to reposition the concept of biophilia within architecture from a relational architectural perspective. Rather than interpreting biophilia primarily through biological or environmental psychological frameworks that emphasize human physiological and psychological responses to natural settings, this study conceptualizes architecture as a spatial medium through which the experience of human dwelling is organized, mediated, and interpreted by means of spatial relationships.

Consistent with this objective, the literature examined in this study is organized into two principal domains of knowledge.

1. The development of the concepts of biophilia and biophilic design in architecture. The first body of literature investigates the historical and conceptual development of biophilia, beginning with [Wilson \(1984\)](#) foundational formulation of the concept. The discussion subsequently examines its translation into environmental and architectural design through the pioneering work of ([Kellert and Wilson 1993](#); [Kellert and Calabrese 2015](#); [Kellert 2018](#)), followed by a review of more recent developments within contemporary architectural discourse. Kellert's contributions represent one of the earliest systematic efforts to transform the concept of biophilia into a coherent set of environmental design principles, whereas the works of Zhong and Yasar illustrate more recent architectural interpretations presented within internationally recognized scholarly publications. Examining these contributions makes it possible to understand the conceptual origins of biophilia prior to its incorporation into architecture, its initial adaptation within architectural theory and practice, and its subsequent theoretical evolution.
2. Architectural theory. The second body of literature focuses on the ontological foundations of architecture ([Hillier and Leaman 1976](#); [Younés 2003](#); [Salura 2026b](#); [2026a](#)), the theory of Relational Spatial Form (RSF), and the Sequence–Orientation–Threshold–Hierarchy (SOTH) framework. Within the RSF perspective, architectural space is understood as a relational system through which the human body perceives, experiences, and interprets its surrounding environment. Meanwhile, the SOTH framework functions as an architectural

interpretive operator for examining how embodied experience is constituted through the organization of spatial relationships (Salura 2026a). Through these theoretical perspectives, biophilic experience is interpreted not primarily as a reaction to decorative natural components but rather as a consequence of the spatial relationships that organize and structure human inhabitation.

Analytical framework

The analysis was conducted through the following stages:

1. Examining contemporary discourse on biophilic architecture with particular emphasis on the prevailing tendency to equate biophilic design with green aesthetics and visually appealing representations of natural environments.
2. Critically interpreting the concept of biophilia through the ontological perspective of architecture together with the theory of Relational Spatial Form (RSF) to explain how relational spatial structures shape embodied experiences of dwelling. This stage further incorporates the operational application of the Sequence, Orientation, Threshold, and Hierarchy (SOTH) framework as an interpretive mechanism for analyzing architectural space.
3. Constructing a conceptual synthesis through which biophilia is repositioned as an intrinsic dimension of the human experience of dwelling rather than as a purely visual or nature-inspired layer superficially applied to architectural space.

This investigation is directed toward developing a theoretical and conceptual framework for interpreting biophilia within the architectural discipline. Accordingly, the study does not attempt to quantify biological responses, perform psychological measurements, or conduct technical simulations of environmental performance. Instead, its primary objective is to formulate an architectural interpretation of human dwelling experience through the relational organization of space.

Furthermore, this research does not include an extensive empirical examination of individual buildings or architectural case studies. Consequently, the findings should be understood primarily as a conceptual foundation and

theoretical interpretive framework that may subsequently be refined, validated, and expanded through future design research and empirical investigations involving architectural case studies.

Results and discussion

Biophilia and the question of architectural ontology

The concept of biophilia has two principal intellectual origins, each representing a different interpretation of the relationship between human beings and life. During the 1970s, the psychologist Erich Fromm characterized biophilia as the "love of life," describing it as a fundamental orientation expressed through two essential tendencies: the preservation of life in opposition to death and the constructive integration of human beings with one another (Fromm 1964; 1973). From this perspective, biophilia was not formulated as a biological theory but as an ethical and psychological disposition manifested through the human capacity to nurture, create, sustain, and cultivate life. For Fromm, therefore, biophilia embodied an affirmative orientation toward existence, reflected in continuous processes of care, growth, and human flourishing.

The contemporary concepts of biophilic design and biophilic architecture originate primarily from the work of the biologist Edward O. Wilson, whose scholarship sought to explain the evolutionary relationship between human beings and the natural world. In *Biophilia* (1984), Wilson argued that modern society had become progressively detached from nature despite humanity's long evolutionary dependence on natural environments. He defined biophilia as the "innate tendency to focus on life and lifelike processes." According to Wilson, this inclination is embedded within human evolutionary history and reflects an inherent affinity for living organisms and ecological systems. He further proposed that a deeper understanding of other forms of life strengthens human appreciation of their intrinsic value, which, in turn, enriches humanity's understanding of itself. Consequently, biophilia should not be interpreted merely as a preference for natural settings but as a fundamental orientation that connects human

identity, knowledge, and ethical responsibility with the broader community of life.

As the concept gained wider recognition, Wilson's interpretation of biophilia increasingly became the theoretical justification for incorporating natural features into the built environment. Among the earliest and most influential scholars responsible for translating this concept into environmental and architectural design was Stephen R. Kellert, a professor at the Yale School of Forestry & Environmental Studies. In *The Biophilia Hypothesis* (1993), co-edited with Wilson, Kellert did not yet formulate the concept of biophilic design in its contemporary architectural sense. Instead, the volume primarily explored the theoretical foundations of the biophilia hypothesis, including its biological basis, environmental psychological dimensions, ecological ethics, and the multifaceted relationship between human beings and nature.

Reflecting Kellert's academic expertise, the volume approached biophilia predominantly from the perspectives of biology, environmental psychology, and human–nature relationships rather than from an architectural standpoint. Consequently, although *The Biophilia Hypothesis* established the intellectual foundation for subsequent discussions concerning biophilic design, it did not yet offer a specifically architectural framework capable of explaining how biophilia could be translated into spatial organization or embodied experiences of dwelling.

It was not until the publication of *Biophilic Design: The Theory, Science, and Practice of Bringing Buildings to Life* (2008) that Kellert explicitly defined biophilic design as "the deliberate attempt to translate an understanding of the inherent human affinity to affiliate with natural systems and processes, known as biophilia, into the design of the built environment." Building upon Wilson's concern regarding the growing separation between modern society and nature, Kellert reframed this issue as a critique of contemporary architecture, arguing that excessive dependence on mechanistic, technological, and artificial environments had weakened the human relationship with the natural world.

Kellert maintained that because human evolution occurred within natural ecosystems, both the human body and mind continue to require regular interaction with daylight, vegetation,

natural forms and patterns, seasonal cycles, fresh air, and ecological complexity. Based on this premise, he proposed six principal dimensions of biophilic design: environmental features, natural shapes and forms, natural patterns and processes, light and space, place-based relationships, and evolved human–nature relationships. These dimensions were subsequently elaborated into approximately seventy biophilic attributes, which have since become one of the principal theoretical foundations underpinning contemporary discussions of biophilic architecture.

A careful examination of Kellert's work demonstrates that biophilia was never intended to signify the simple addition of vegetation to buildings. Instead, his interpretation emphasized multisensory engagement, experiential qualities of space, attachment to place, ecological processes and patterns, and the biological dimensions of human well-being. Nevertheless, despite this broader theoretical scope, many subsequent interpretations and practical applications of biophilic design have increasingly privileged visually recognizable natural features, often reducing the concept to greenery and nature-inspired architectural aesthetics.

Despite its considerable influence on architectural discourse, Kellert's framework exhibits several important conceptual limitations.

The first limitation concerns the instrumental treatment of nature. Although Kellert differentiated biophilia into two complementary dimensions, an organic dimension, associated with living systems, and an inorganic dimension, related to attachment to place as frequently manifested in vernacular environments, his overall argument ultimately converges on the proposition that nature is valuable because it improves human health, enhances productivity, reduces stress, and supports psychological restoration. Consequently, the natural environment is predominantly interpreted as a resource for optimizing human performance and well-being rather than as an ontological condition that fundamentally shapes architectural existence.

A second limitation lies in the conceptual breadth of the framework, which leaves the ontological relationship between biophilia and architecture insufficiently clarified. When daylight, vegetation, water, natural materials, geometric configurations, prospect–refuge conditions, mystery, natural ventilation, and numerous other environmental qualities are all classified as biophilic attributes, the concept

gradually loses explanatory precision with respect to what constitutes the architectural essence of dwelling. Rather than identifying the fundamental spatial structures through which architecture enables human inhabitation, biophilia becomes an aggregation of desirable environmental characteristics assumed to produce successful architecture. As a result, the more fundamental relational conditions that allow these qualities to acquire architectural meaning remain largely unexplored.

The third limitation concerns the framework's tendency toward romantic naturalism. Although Kellert consistently emphasizes the restorative and beneficial qualities of natural environments, considerably less attention is devoted to nature's more demanding and unpredictable dimensions. Nature is not exclusively harmonious or restorative; it may also be hazardous, chaotic, conflict-ridden, and associated with disease, vulnerability, and physical discomfort. An overly romantic interpretation therefore obscures the historical reality that human existence has never been characterized by complete harmony with nature. Instead, the relationship between humans and the natural world has continually involved negotiation, adaptation, mediation, and transformation rather than passive coexistence.

Consequently, although Kellert's scholarship made a substantial contribution to integrating biophilia into environmental and architectural design, its philosophical orientation remains largely anthropocentric. Within this perspective, nature is principally valued because of the benefits it provides to human beings. The framework therefore stops short of embracing a more comprehensive ecological understanding in which humans are recognized not simply as recipients of nature's benefits but as participants within a broader, dynamic, and interdependent network of life.

From the standpoint of architectural theory, Kellert's work unquestionably represents a significant effort to establish connections between biophilia and design practice. Nevertheless, the primary emphasis continues to be placed on nature itself rather than on architecture as a distinct disciplinary domain. This tendency remains evident throughout much of the contemporary literature on biophilic architecture (Browning and Ryan 2020; Richardson and Butler 2022; Zhong, Schröder, and Bekkering 2022; Tabassum and Park 2024; Yasar and Öktem Erkartal 2026), where scholarly discussions

frequently concentrate on natural elements, ecological systems, environmental performance, and human responses to nature while giving comparatively limited attention to the architectural structures through which such experiences are spatially organized and mediated.

Because contemporary interpretations have increasingly reduced biophilic design to vegetation, green aesthetics, and visually expressive representations of nature, the present study returns to Wilson's original philosophical conception of biophilia as its principal point of departure.

- Wilson explicitly rejected the romanticized image of the "noble savage," which assumes that human beings are capable of existing in complete harmony with nature. Instead, he argued that humanity is simultaneously a product of biological evolution and cultural development. Human existence therefore occupies an intermediate position between the natural and the artificial. This perspective provides an important foundation for understanding architecture, not as an attempt to return human beings literally to nature, nor merely as the incorporation of natural elements into buildings, but as a relational medium through which the relationship between human beings and the lifeworld is continuously mediated. Within this theoretical perspective, the concept of Relational Spatial Form (RSF) and the ontological understanding of architecture as a setting for dwelling indicate that architectural meaning does not originate solely from visual appearance or symbolic references to nature. Rather, meaning emerges through the capacity of spatial organization to establish meaningful relationships among the human body, everyday activities, the surrounding environment, and ecological life as an integrated whole.
- Wilson further argued that contemporary civilization has shifted excessively toward what he described as the "machine antipode," a technological and artificial condition that increasingly distances humanity from its biological origins. Importantly, however, Wilson did not propose abandoning science or technology as a solution to ecological crises. Instead, he advocated developing a more profound understanding of the complexity, interconnectedness, and interdependence of living systems. From this perspective, the

central problem lies not in technology or artificiality themselves but in the manner through which humans understand and negotiate their relationship with life. Within architectural discourse, this position calls for an ontological interpretation of architecture that extends beyond viewing buildings merely as technical products, visual objects, or functional machines. Instead, architecture should be understood as a setting for dwelling that structures the essential relationships among the human body, spatial organization, the surrounding environment, and the broader lifeworld. Accordingly, architecture should be positioned neither as the opposite of nature nor as a purely technological artifact. Rather, it functions as a relational medium through which human beings maintain an existential connection with life, even while inhabiting increasingly modern, technological, and artificial environments.

Relational Spatial Form (RSF) as a structure of dwelling experience and its operationalization

The theoretical foundation of this study is grounded in the premise that the essential purpose of architecture is to provide an environment in which human dwelling can take place. From this perspective, architecture should not be understood merely as a physical object or material artifact; rather, it constitutes an ontological relationship linking the human body, the fundamental requirements of inhabitation, and the spatial configurations through which those requirements are accommodated (Salura, 2026c). Accordingly, architecture is conceived not as an autonomous object of visual appreciation but as a relational

structure that enables, organizes, and sustains human life.

Admittedly, this interpretation does not claim to represent the only possible definition of architecture, nor does it encompass the diversity of existing architectural theories and intellectual traditions. Nevertheless, within the scope of the present study, this ontological understanding serves as the principal theoretical foundation. It establishes the conceptual basis for examining biophilia not as an isolated architectural feature or decorative design strategy, but as a spatial quality whose significance derives from the manner in which architecture supports, organizes, and mediates the experience of dwelling.

Such an understanding clearly distinguishes architecture from other disciplinary perspectives commonly employed in biophilic research. Biology is primarily concerned with the physiological responses of the human organism to natural environments. Psychology investigates the influence of environmental conditions on emotion, cognition, and behavior. Environmental science examines ecological systems and the processes through which they function. Meanwhile, cultural and symbolic approaches explore the meanings that societies attribute to nature through cultural traditions, symbolism, and spiritual beliefs. Architecture, by contrast, is fundamentally concerned with the ways in which experiences of nature are spatially organized and mediated (Salura and Clarissa 2024). Consequently, regardless of how extensively natural elements are incorporated into a building, architecture itself should not be regarded as the direct source of biophilic experience. Instead, it serves as the spatial medium through which that experience becomes possible.

Table 1. The distinctive object of architectural inquiry

Field of study	Primary focus
Biology	How the biological body responds to natural environments
Psychology	How the environment influences emotions and behavior
Environmental Science	What environmental systems function from an ecological perspective?
Cultural-Symbolic Approach	How nature is interpreted and endowed with cultural and spiritual meanings
Architecture	How experiences of nature are structured and mediated through spatial organization

Consistent with this theoretical position, architectural meaning does not reside exclusively in physical form. Instead, it emerges through architecture's capacity to support human dwelling and facilitate the activities through which individuals sustain, develop, and enrich their lives. Previous research has demonstrated that architecture, understood as a setting for dwelling,

always embodies an inseparable relationship among spatial configuration, lived experience, and meaning (Salura 2026b). This proposition, however, raises a fundamental theoretical question: what mechanism connects these three dimensions? How does one move from the physical organization of architectural elements to the lived experience of inhabitation? Spatial

configurations, by themselves, do not automatically generate experiences of dwelling, just as dwelling cannot be reduced solely to the subjective perceptions of individual occupants. This observation gives rise to another essential question: what minimum condition must exist to ensure that the interpretation of spatial configuration extends beyond a simple description of topology while preventing experiential interpretation from dissolving into purely subjective impressions detached from the ontological domain of architecture? Put differently, what relational structure enables physical spatial configurations to become meaningful architectural experiences while remaining grounded in architecture's fundamental role as a setting for human dwelling?

Addressing this question requires identifying a relational framework capable of explaining how architectural configurations allow the human body to experience space as a place for inhabitation. It is precisely within this theoretical context that Relational Spatial Form (RSF) is proposed. RSF represents the minimum relational structure that mediates between physical spatial organization and lived experience, thereby explaining how architectural arrangements become meaningful conditions of dwelling. Rather than privileging either physical form or subjective interpretation independently, RSF provides a conceptual framework that explains how spatial relationships satisfy the essential requirements of inhabitation and consequently generate architectural meaning.

Within this study, Relational Spatial Form (RSF) is therefore defined as the minimum relational structure through which physical spatial configurations become architecture. It functions as the mediating framework that connects spatial organization with the lived experience of dwelling. Through RSF, the human body becomes capable of recognizing sequential order, spatial orientation, thresholds, hierarchy, and the possibilities for inhabitation embedded within architectural space.

Importantly, RSF should not be confused with visual composition, façade treatment, stylistic expression, or architectural imagery. Rather, it refers to the underlying relational framework that enables spatial configurations to operate as meaningful conditions of dwelling. From this perspective, RSF provides the relational logic through which architectural space becomes intelligible, inhabitable, and experientially

meaningful. It is this relational organization, not merely the presence of physical components, that allows architecture to fulfill its essential purpose as a setting for human habitation.

RSF operates at the level of what is termed the Pre-Bubble Envelope, or the pre-visual envelope, the relational condition of architectural space that exists before façades, materials, symbolism, and visual expression begin to dominate human perception. The central premise underlying RSF is that whenever architecture functions as a setting for dwelling and everyday activity, the human body initially interprets relationships within space rather than decorative or stylistic features. In other words, embodied experience is first organized through relational spatial structures before it is subsequently influenced by visual, symbolic, or aesthetic attributes. For this reason, any discussion concerning the contribution of natural elements to biophilic architecture must first establish an understanding of the relational framework that enables the human body to experience space as a place of dwelling, together with the analytical mechanism through which this framework can be interpreted. At this point, the operationalization of RSF becomes indispensable because it explains how relational spatial structures are translated into lived experience and how architectural meaning emerges through bodily engagement with space before visual form or symbolic representation becomes the dominant mode of interpretation.

As individuals enter and move through a building, their initial encounter is not with façades, ornamentation, or symbolic imagery. Instead, the body immediately perceives direction, sequence, enclosure, openness, transition, and spatial hierarchy. Architectural space is therefore not experienced as a static visual composition but as a dynamic phenomenon that unfolds through bodily movement. Walking, turning, entering, pausing, observing, and navigating collectively shape the way architecture is experienced over time. Consequently, spatial experience should be understood as a sequential process rather than as the perception of a fixed image.

This experiential process, however, is far from random. Throughout movement, the body must continuously establish its location and direction within the surrounding environment. Such spatial orientation enables occupants to recognize the relationships between successive spaces and to construct a coherent understanding of the

architectural environment. Every movement likewise involves moments of transition, expressed through thresholds that signal changes in atmosphere, spatial character, levels of privacy, and experiential intensity. Simultaneously, occupants continually interpret variations in spatial importance and dominance, allowing them to distinguish principal spaces from secondary ones, public domains from private territories, and focal points from supporting areas.

Accordingly, the experience of dwelling depends not only upon movement through space but also upon architecture's capacity to establish intelligible orientation, recognizable thresholds, and coherent spatial hierarchies. These four interrelated concepts Sequence, Orientation, Threshold, and Hierarchy (SOTH) serve as operational spatial operators through which the relational structure of RSF becomes experientially accessible. Through SOTH, the relational logic embedded within architectural configurations can be perceived, interpreted, and embodied, thereby allowing architecture to function as a meaningful setting for human dwelling.

Interestingly, several concepts identified in this study as Sequence, Orientation, Threshold, and Hierarchy (SOTH) already appear implicitly within Kellert's framework of biophilic design. Under the category Experience of Space and Place, Kellert discusses principles such as mobility and wayfinding, transitional spaces, prospect and refuge, organized complexity, and the integration of parts into coherent wholes. These concepts implicitly acknowledge that human experience is shaped not solely by natural elements but also by spatial qualities that influence orientation, transition, legibility, and degrees of protection.

Nevertheless, within Kellert's framework these spatial characteristics remain only one category among numerous biophilic attributes. The present study advances a different interpretation by arguing that these relational qualities occupy a far more fundamental architectural position because they constitute the underlying structure through which all forms of spatial experience, including biophilic experience, become possible. Rather than representing optional design attributes, they function as the essential conditions that enable architecture to support meaningful dwelling. From this perspective, Relational Spatial Form (RSF) explains the minimum relational

framework through which physical-spatial configurations become conditions of inhabitation, whereas Sequence, Orientation, Threshold, and Hierarchy (SOTH) describe how those relational structures are perceived, interpreted, and experienced by the human body. Within this conceptual framework, the quality of dwelling is not determined primarily by visual appearance, material selection, symbolic references, or individual architectural elements. Instead, meaningful inhabitation emerges from relational spatial configurations that enable occupants to establish orientation, recognize transitions, comprehend hierarchy, and perceive opportunities for movement, occupation, and action within architectural space.

Accordingly, the relational conditions described by RSF and operationalized through SOTH precede the emergence of biophilic experience. Natural elements do not, in themselves, create the conditions for dwelling. Rather, they acquire architectural significance only when incorporated into a relational spatial framework that already enables the body to inhabit space meaningfully. Consequently, the architectural value of vegetation, water, daylight, natural materials, or other environmental features depends not merely upon their physical presence but upon the extent to which they reinforce and enrich the relational organization through which inhabitation is experienced.

This understanding ultimately raises a more fundamental theoretical question concerning the ontological position of biophilia within the structure of dwelling itself. Should natural elements be regarded as the foundational basis of architectural inhabitation, or do they instead enrich an experiential framework that has already been constituted through relational spatial organization? The following discussion addresses this question by examining how biophilic qualities relate to the fundamental conditions through which architecture enables meaningful human dwelling.

Repositioning biophilic through relational spatial form

This section addresses two interrelated issues. First, it argues that biophilia should not be regarded as the ontological foundation of architecture. Second, it explains how Relational Spatial Form (RSF) functions as the relational structure through which architecture acquires its most fundamental meaning.

The primary question explored in this study concerns whether biophilia occupies an ontological position within architecture. Based on the preceding theoretical discussion, this research contends that biophilia cannot be understood as architecture's ontological foundation.

Architecture comes into existence because human beings require places in which life can be sustained, organized, and developed through the activities of dwelling. Shelter, rest, work, social interaction, and the organization of everyday existence all represent fundamental conditions that precede the emergence of biophilic experience. Although these necessities ultimately arise from humanity's relationship with nature, architecture itself is not primarily constituted by the presence of natural elements. Rather, it exists because human life requires spatial conditions that make inhabitation possible.

From this perspective, the ontological basis of architecture lies not in biophilia but in dwelling itself. Dwelling represents the biological and existential condition through which human beings sustain and develop their lives within environments that are largely mediated by architecture and other artificial settings. Consequently, biophilia cannot be regarded as the minimum prerequisite for architectural existence. Human beings are capable of dwelling without gardens, vegetation, or particular natural materials, yet they cannot meaningfully inhabit space without orientation, protection, recognizable boundaries, and spatial legibility. Accordingly, biophilia should be understood not as the ontological foundation of architecture but as a quality that enriches the experience of dwelling once its more fundamental conditions have already been established.

If dwelling constitutes architecture's ontological foundation, the next question concerns how the human body experiences dwelling. Within the framework of Relational Spatial Form (RSF), the body does not initially seek healing, restoration, wellness, or even a sense of connection with nature. Before such experiences can emerge, occupants must first be capable of recognizing direction, establishing their position within space, identifying centers and boundaries, experiencing protection, and locating places of retreat that support meaningful human activities.

These conditions correspond to what previous studies have identified as basic-essential meaning (Salura & Clarissa, 2024). This fundamental

meaning is neither symbolic nor dependent upon culturally specific interpretations. Instead, it arises directly from architecture's capacity to support the essential requirements of human dwelling. Through Relational Spatial Form (RSF) and its operationalization by means of Sequence, Orientation, Threshold, and Hierarchy (SOTH), architectural space enables the body to comprehend spatial sequence, establish orientation, recognize transitions, and interpret hierarchical relationships that collectively constitute the experience of inhabitation.

Viewed from this perspective, biophilic experience does not generate architecture's basic-essential meaning. On the contrary, it is precisely the fundamental meaning established through the relational organization of space that allows biophilic qualities to emerge and acquire architectural significance. Vegetation, daylight, water features, and atmospheres associated with nature become meaningful only after the body has already achieved orientation, protection, spatial legibility, and the capacity to dwell within the environment.

Conversely, an excessive reliance on biophilic attributes without an adequately developed relational spatial framework risks reducing biophilia to a superficial architectural layer. Under such circumstances, vegetation, natural materials, and symbols associated with nature function primarily as visual embellishments rather than as integral components of architectural experience. In certain situations, they may even diminish spatial clarity or interfere with the experience of dwelling itself. This condition may appropriately be described as cosmetic biophilia, in which natural elements operate principally at the levels of visual appearance and atmospheric effect without becoming structurally integrated into the spatial organization that supports inhabitation. Consequently, the simple inclusion of natural features cannot, by itself, ensure a meaningful biophilic experience when the relational conditions required for dwelling remain unresolved.

By contrast, integrated biophilia is achieved when natural elements are embedded within the relational structure of architectural space in ways that strengthen orientation, transition, hierarchy, protection, and the overall experience of dwelling. Under these conditions, nature is no longer treated as decorative ornamentation but instead becomes an active component of the spatial organization through which architecture supports inhabitation.

Vegetation, daylight, water, and other natural elements therefore derive their architectural significance not from their isolated presence but from the manner in which they reinforce a coherent relational structure of dwelling. The distinction between cosmetic and integrated biophilia thus demonstrates that the architectural value of biophilic design depends far less upon the quantity of natural elements than upon the degree to which those elements participate in and strengthen the relational organization of spatial experience.

Accordingly, this study proposes that the architectural position of biophilia is most appropriately understood as an additional layer of meaning that enriches the experience of dwelling after the basic-essential meaning generated through Relational Spatial Form (RSF) has already been established. Biophilia therefore contributes to the qualitative enhancement of inhabitation without replacing the ontological conditions that make dwelling possible in the first place.

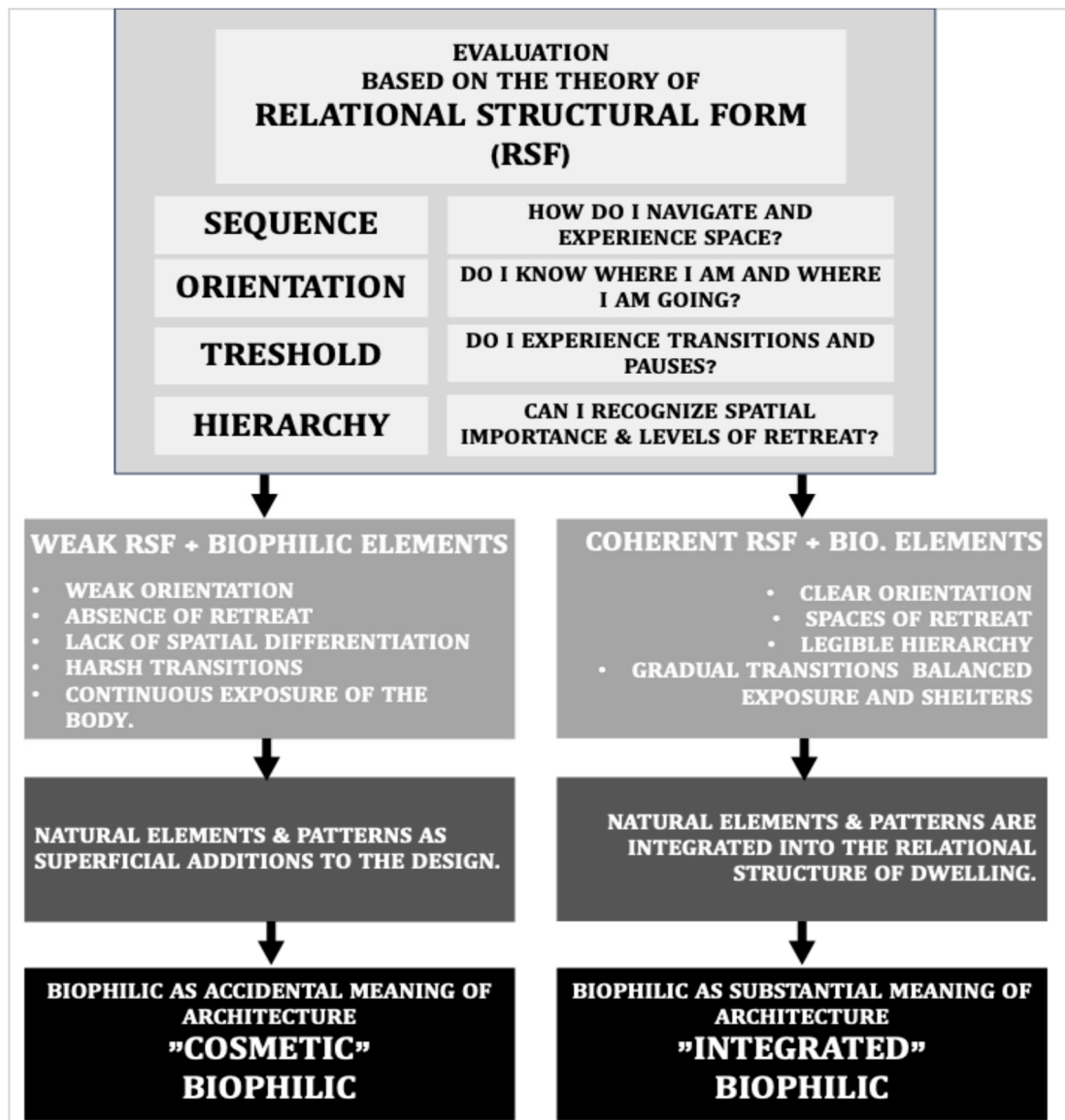


Figure 1. The repositioning the concept of biophilia within architectural dwelling
 Contributions, limitations, and future research directions

This study makes several important contributions to the ongoing discourse on biophilic architecture.

First, it reconceptualizes biophilia by shifting its emphasis from the presence of natural objects toward the experience of dwelling. Much of the contemporary literature on biophilic design has focused primarily on vegetation, daylight, water features, natural materials, and other environmental characteristics associated with nature. The present study demonstrates that the essence of biophilic experience does not originate principally from these physical elements. Instead, it emerges through the relational organization of architectural space, which enables the human body to establish orientation, experience protection, negotiate transitions, recognize hierarchy, and ultimately inhabit space meaningfully. Accordingly, biophilia is interpreted not as a collection of natural components but as a spatial quality mediated through architectural experience.

Second, this research advances a specifically architectural interpretation of biophilia through the concepts of Relational Spatial Form (RSF) and its operationalization by means of Sequence, Orientation, Threshold, and Hierarchy (SOTH). Within this framework, natural elements are not regarded as independent objects that directly influence occupants. Rather, their architectural significance derives from the relational spatial structure within which they are experienced. Consequently, this study offers an interpretation of biophilia that differs fundamentally from the biological and environmental-psychological perspectives that have largely dominated previous scholarship.

Third, this study introduces the distinction between fundamental-essential meaning and additional meaning to clarify the architectural position of biophilia. It argues that the incorporation of natural elements should not be regarded as the minimum ontological requirement of architecture. Although architecture undoubtedly emerges from the long-standing relationship between humanity and nature, its most fundamental condition lies in the capacity of space to support dwelling through orientation, legibility, protection, and opportunities for meaningful human action. From this perspective, biophilic qualities function as an additional layer of meaning that enriches dwelling after architecture's fundamental conditions have already been established.

Fourth, this research differentiates between cosmetic biophilia and integrated biophilia. While similar distinctions have occasionally appeared in previous discussions, the present study explicitly formulates and situates this differentiation within a coherent architectural framework. Cosmetic biophilia refers to the application of natural elements that operate primarily as visual or atmospheric embellishments. Integrated biophilia, by contrast, describes situations in which natural elements are embedded within the relational structure of dwelling established through RSF and SOTH. This distinction provides a conceptual and evaluative framework that enables scholars and practitioners to assess biophilic design more critically by examining not merely the presence of nature-related features but the extent to which those features contribute to the spatial conditions that support inhabitation.

Despite these contributions, several limitations should also be acknowledged.

First, this investigation remains primarily theoretical and conceptual. The framework proposed for evaluating biophilic architecture has not yet been comprehensively examined through a wide range of empirical architectural case studies. Consequently, additional empirical research is required to validate, refine, and extend the proposed framework.

Second, the study intentionally concentrates on the architectural interpretation of biophilia and therefore does not provide a detailed examination of the physiological, neurological, or psychological dimensions that have been extensively explored within the broader literature on biophilic design. The objective of this research is not to replace those perspectives but rather to complement them by addressing an important gap in the architectural understanding of biophilia.

Third, although this study distinguishes between fundamental-essential meaning and additional meaning, more explicit operational criteria remain necessary for differentiating these categories across diverse architectural contexts. Future refinement should therefore focus on translating this conceptual distinction into practical analytical instruments that can be applied consistently across various building typologies and spatial environments.

Future investigations may evaluate the applicability of the RSF and SOTH framework across a broad spectrum of architectural settings, including residential buildings, educational

facilities, healthcare environments, and public spaces, to examine how biophilic qualities contribute to dwelling experiences within different contexts. Furthermore, developing more explicit operational indicators capable of distinguishing cosmetic biophilia from integrated biophilia represents an important direction for future research, strengthening both the analytical rigor and practical applicability of the theoretical framework proposed in this study.

Conclusions

This study originated from a critical examination of the prevailing tendency within contemporary biophilic theory and practice to equate biophilia with the incorporation of vegetation, natural materials, daylight, and other visually recognizable attributes associated with nature. Although such elements undoubtedly enhance the environmental quality of architectural settings, the present study argues that biophilic experience is not fundamentally generated by natural objects themselves. Rather, it is mediated through the relational organization of architectural space that shapes how the human body experiences dwelling.

By examining both the origins of biophilia and its subsequent development within the discourse of biophilic design, this study demonstrates that current explanations remain predominantly grounded in biological, psychological, and health-oriented perspectives concerning the benefits of human interaction with nature. Comparatively less attention has been devoted to understanding how these relationships are constituted through architectural space. To address this theoretical gap, the study proposes Relational Spatial Form (RSF) as the minimum relational framework through which physical-spatial configurations become conditions of dwelling, while Sequence, Orientation, Threshold, and Hierarchy (SOTH) are introduced as operational spatial operators that explain how this relational framework is experienced by the human body.

The principal conclusion reached by this study is that biophilia does not constitute the ontological foundation of architecture. Rather, the ontological basis of architecture lies in the human need for dwelling, the fundamental condition through which people sustain, organize, and develop their lives within space. Before experiences commonly

associated with biophilia, including healing, restoration, wellness, or connection with nature, can emerge, the human body must first establish orientation, legibility, protection, boundaries, hierarchy, and the capacity to inhabit architectural space. These conditions collectively constitute architecture's fundamental meaning, arising directly from the relational organization of space itself.

Within this theoretical framework, biophilic experience should therefore be understood as an additional layer of meaning that enriches the experience of dwelling once its fundamental conditions have already been fulfilled. Natural elements do not directly generate dwelling; instead, they acquire architectural significance only when integrated into a relational spatial structure that enables the body to experience orientation, transition, hierarchy, and meaningful engagement with its environment. Consequently, this study proposes a fundamental repositioning of biophilia, from an object-centered perspective focused primarily on natural elements toward an architectural understanding centered on dwelling experience and relational spatial organization.

From a theoretical perspective, this study introduces a new architectural framework for interpreting biophilia through the concepts of Relational Spatial Form (RSF) and Sequence, Orientation, Threshold, and Hierarchy (SOTH). Conceptually, it establishes the distinction between fundamental-essential meaning and additional meaning to clarify the architectural position of biophilia. Fundamental meaning refers to the relational spatial conditions that make dwelling possible, whereas additional meaning encompasses qualities that deepen and enrich inhabitation after those foundational conditions have already been established. From a practical standpoint, the study also provides an evaluative framework for distinguishing cosmetic biophilia, which functions primarily through visual representation, from integrated biophilia, in which natural elements are embedded within the relational structure of dwelling itself. Accordingly, the primary contribution of this research is not to reject biophilic design but to reposition biophilia within the ontological domain of architecture as a quality that enriches rather than substitutes for the fundamental conditions that make meaningful human dwelling possible.

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Author(s) contribution

Purnama Salura contributed to the research concepts preparation, methodologies, investigations, data analysis, visualization, articles drafting and revisions.

Reginaldo Christophori Lake contribute to methodology, supervision, and validation.

Stephanie Clarissa contribute to the research concepts preparation and literature reviews, data analysis, of article drafts preparation and validation.

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