

Original Research Article

Perceptual Metageometry: A Relational Framework for the
Formulation and Analysis of Spatial ExperienceZohreh Shaeri¹, Maryam Majidi², Hamidreza Ebrahimi^{3*}

1. Department of Architecture, Kish International Campus, University of Tehran, Iran

2. Department of Landscape Architecture, Nazar Research Center for Art,
Architecture and Urbanism, Tehran, Iran

3. Department of Landscape Architecture, College of Fine Arts, University of Tehran, Iran

Received: 22/05/2026

Accepted: 07/09/2026

Available online: 23/10/2026

Abstract

Problem statement: Spatial experience in architecture is a multidimensional and dynamic phenomenon contingent upon human–environment interaction, and its explanation cannot be reduced to the physical or geometric attributes of space. Despite the development of numerous theories in the fields of phenomenology, spatial perception, place memory, and spatial structure analysis, the explanatory capacities of these approaches have largely been formulated independently and at different levels, while the manner in which they relate to one another remains subject to a theoretical gap.

Research objective: This study aims to formulate the conceptual framework of “Perceptual Metageometry” by addressing the question of how the explanatory capacities of existing theories can be reorganized within a relational logic to understand spatial experience.

Research method: This is a fundamental study employing a qualitative approach and a critical theoretical synthesis strategy. It was conducted through interpretive analysis, conceptual comparison, and theoretical abstraction of the selected theoretical strands.

Conclusion: The findings indicate that phenomenology, theories of perception, studies of memory and identity, and configurational analysis explain, respectively, the lived, perceptual, temporal–semantic, and structural levels of spatial experience. However, none of these approaches alone explains how the structural conditions of space are transformed into an experience that is perceived, lived, and endowed with temporal and semantic continuity. The synthesis of these levels demonstrates that the quality of spatial experience does not reside in the components themselves; rather, it emerges from the organization of the relationships among them through the mechanisms of emergence, affordance, and feedback. Accordingly, the innovation of Perceptual Metageometry lies not in introducing an alternative theory, but in shifting the unit of explanation from the “component” to the “relation” and in formulating an interdisciplinary level of spatial experience that cannot be derived from the independent examination of any of its constituent domains.

Keywords: *Environmental Phenomenology, Spatial Perception, Lived Experience, Place Memory, Spatial Configuration, Space Syntax*

Introduction

In recent decades, alongside the theoretical shift in architecture and urban planning from physically

oriented and form-centered approaches toward human-centered and experience-oriented perspectives, the explanation of spatial experience has become one of the major concerns in the field. This shift has emerged

*Corresponding Author: H.ebrahimi@yahoo.com, +98 912 790 1575

as a critical response to the limitations of analytical approaches that regarded space primarily as a static, geometric, and measurable structure and were limited in their ability to explain its perceptual, sensory, and semantic qualities (Norberg-Schulz, 1980; Till, 2009). In contrast, contemporary approaches conceptualize spatial experience as a multidimensional, dynamic, and temporal phenomenon that is constituted through the interrelations among spatial structure, perception, embodiment, movement, memory, and meaning (Merleau-Ponty, 1962; Pallasmaa, 2012). Accordingly, the concern of contemporary studies is not merely to identify the components of spatial experience, but rather to explain the relationships among the levels involved in its formation.

The literature in this field has provided diverse theoretical capacities for explaining the perceptual, lived, memory–semantic, and structural dimensions of spatial experience (Lynch, 1960; Hillier & Hanson, 1984; Halbwachs, 1992; Montello, 2007; Assmann, 2011; Batty, 2013). Nevertheless, the multiplicity of these capacities does not necessarily imply the existence of a logic capable of explaining the relationships among them. The issue becomes apparent when spatial experience is considered not within the confines of any one of these levels, but as a phenomenon arising from the relationships among them. Accordingly, the theoretical gap addressed by the present study lies not in the absence of another theory or component, but in the lack of a coherent conceptual formulation for explaining the relationships among spatial structure, perception, lived experience, and memory—one capable of revealing a level of explanation that cannot be derived from the independent analysis of any of these levels.

In response to this gap, the present study proposes “Perceptual Metageometry” as a meta-analytical framework for formulating the relationships among spatial structure, perception, lived experience, and memory. The intended innovation lies neither in adding an independent theory or component to the existing literature nor in descriptively aggregating previous approaches, but rather in reorganizing their explanatory capacities on the basis of a relational logic. Within

this framework, “geometry” is not confined merely to the form, distance, and arrangement of elements; rather, it refers to a level of relational formulation that enables the analysis of how different levels contribute to the constitution of spatial experience. Perceptual Metageometry therefore takes as its object of explanation not the independent functioning of components, but the relationships among them and the quality that emerges from the organization of these relationships. Accordingly, the main research question is formulated as follows:

How can the explanatory capacities of existing theories be reorganized through the formulation of a theoretical and relational framework so that spatial experience, as a multilayered, dynamic, and temporal phenomenon, can be explained in an integrated manner?

The aim of this study is to formulate the framework of “Perceptual Metageometry” to explain the relationships among spatial structure, perception, lived experience, and memory, and to reveal a level of experience that cannot be derived from the isolated analysis of these levels. To achieve this aim, the explanatory capacities, distinctions, points of connection, and limitations of the relevant theoretical strands are first examined. Subsequently, through critical theoretical synthesis, the logic governing the relationships among these levels is extracted, and the proposed conceptual framework is formulated. The explanatory capacity of the framework and its theoretical and analytical implications are then examined, and finally, the boundaries of its validity and scope of application are delineated.

Literature Review

The literature on spatial experience can be organized into five major theoretical strands, whose differences pertain less to entirely distinct subject matters than to the level at which spatial experience is explained (Tuan, 1977; Pallasmaa, 2012). Accordingly, rather than providing a detailed account of each strand, the present review compares them according to three criteria: explanatory capacity, explanatory boundaries, and their relationship to other levels of experience. The purpose of this comparison is to identify the points at which the

explanation of one level becomes dependent on another level for a comprehensive understanding of the process of spatial experience.

Architectural phenomenology places lived experience, embodiment, and presence at the center of understanding space, explaining the quality of human engagement with the environment at the level of experience and meaning (Merleau-Ponty, 1962; Zumthor, 2006). The explanatory boundary of this approach lies in its lack of an analytical formulation of the structural organization and configuration of spatial relationships. In contrast, theories of spatial perception and cognition focus on legibility, routes, visual fields, and the cognitive organization of the environment, explaining how space is perceived and represented (Lynch, 1960; Golledge, 1999). However, the temporal and semantic continuity of experience remains outside their primary focus. Environmental psychology establishes connections among perception, behavior, and environmental qualities by focusing on human–environment interaction (Canter, 1977; Nasar, 1992), while more recent studies have increasingly emphasized the multisensory and embodied dimensions of experience (Böhme, 2017; Pallasmaa, 2012). Nevertheless, this strand, considered independently, does not formulate the structural logic of spatial relationships. Studies of collective memory and place identity, in turn, introduce the temporal–semantic dimension of experience into the analysis and emphasize the continuity of memory, meaning, and identity in place (Assmann & Czaplicka, 1995; Low & Lawrence-Zúñiga, 2003). However, the relationship between this continuity and the configurational organization of space often remains implicit.

On the other hand, structural and configurational analyses of space examine the environment as a network of relationships and enable the systematic analysis of connectivity, integration, choice, and movement (Hillier & Hanson, 1984; Turner et al., 2001). This approach differs from experience-oriented strands in its analytical point of departure: whereas the preceding approaches primarily begin with human experience, configurational analysis begins with the structure of spatial relationships. Nevertheless, structural measures

alone do not reveal how these relationships are perceived, lived, or rendered meaningful over time.

The comparison of these theoretical strands reveals three principal areas of overlap. First, phenomenology, theories of perception, and environmental psychology share an acknowledgment of the active role of the human subject, yet they formulate experience, respectively, from the perspectives of lived experience, cognition, and human–environment interaction. Second, environmental psychology and memory studies both consider experience as extending beyond immediate encounters; however, the former emphasizes interaction and behavior, whereas the latter focuses on the continuity of meaning and identity. Third, theories of perception and configurational analysis are both concerned with movement and spatial organization, but the former analyzes this relationship from the standpoint of human perception, whereas the latter approaches it from the standpoint of environmental structure. Thus, the thematic commonalities among these strands do not imply their equivalence; rather, these commonalities, together with their differences in levels of explanation, constitute points of connection across the respective domains. This comparison demonstrates that the principal gap lies not in the absence of a theoretical component, but in the lack of a formulation of the relationships among different levels of explanation. Spatial structure alone does not explain experienced quality; perception without lived experience does not encompass the full quality of presence and action; and ongoing experience without memory does not explain the continuity and reinterpretation of meaning over time. Conversely, memory and meaning cannot be realized independently of experience and spatial context.

Accordingly, the research problem shifts from “selecting a more comprehensive theory” to explaining the relationships among levels that have been formulated relatively independently within distinct theoretical traditions. To systematize this comparison, Table 1 presents a critical synthesis matrix of the theoretical strands. In this matrix, each strand is compared in terms of its fundamental question, explanatory capacity, epistemological limitation, remaining gap, and contribution to the proposed framework. Table 1,

Table 1. Critical synthesis matrix of theoretical strands of spatial experience and their contributions to the formulation of the perceptual Metageometry framework. Source: Authors.

Theoretical strand	Fundamental question	Explanatory capacity	Epistemological limitation	Remaining theoretical gap	Element adopted	Role in the framework
Architectural phenomenology	How do humans experience and live space?	Lived experience; embodiment; presence; atmosphere; meaning of place	Focus on lived experience; lack of an explicit formulation of the structure and configuration of spatial relationships	The relationship between embodied experience and structural conditions and spatial organization remains unexplained	Embodiment; presence; action; quality of lived experience	Lived-experience layer: realization of experience through embodied presence and action under environmental conditions
Spatial perception and cognition	How do humans perceive, organize, and represent the environment?	Legibility; wayfinding; visual field; movement; cognitive map; attention; perceptual organization	Focus on perception and cognition; limited explanation of temporal and semantic continuity	The simultaneous relationship of perception with lived experience, memory, and temporal reinterpretation remains unexplained	Route; visual field; wayfinding; legibility; attention; cognitive organization	Perceptual layer: perception and organization of environmental conditions in encounters with space
Environmental psychology	How does Human–environment interaction shape perception, behavior, and experience?	Human–environment interaction; behavior; perceptual evaluation; sensory qualities; emotional response	Lack of an independent logic for spatial structure and for the simultaneous integration of all levels of experience	The reciprocal reconfiguration of environment, perception, action, and experience requires a multilevel formulation	Human–environment interaction; reciprocal relationship among perception, behavior, and environment	Feedback mechanism: reciprocal influence among environment, perception, action, and experience; not an independent layer
Collective memory and place identity	How does experience persist, and how does place acquire meaning and identity?	Temporality; memory; attachment; identity; continuity; reinterpretation of the meaning of place	Focus on cultural and semantic continuity; limited explanation of the structural mechanisms of memory	The memory–semantic relationship between experience and spatial organization has not been systematically explained	Memory; temporality; meaning; attachment; reinterpretation	Memory–semantic levels: continuity and reinterpretation of experience over time
Systemic analysis and spatial configuration	How do spatial relationships shape movement, visibility, accessibility, and encounter?	Network relationships; connectivity; integration; choice; depth; movement; visual field	Focus on structure and configurational measures; incomplete explanation of perceptual, lived, and memory-related qualities	The transformation of structural conditions into perceived, embodied, and meaningful experience cannot be inferred from the measures	Relational logic; network; configuration; connectivity; movement; visual field	Structural–configurational layer: relational conditions as the basis for the occurrence and organization of experience
Perceptual Metageometry	How can the relationships among structural, perceptual, lived, and memory–semantic levels be explained without reductionism?	Experience within the relationships among four layers; qualities emerging from their organization	Current validity is conceptual–explanatory; lack of established empirical indicators	Operationalization of relationships; testing of cross-level qualities; assessment of validity and transferability	Reorganization of the four levels; emergence; affordance; feedback	Shifting the unit of explanation from the “component” to the “relation”; analysis of cross-level qualities emerging from relationships

constituting the Perceptual Metageometry framework. The inferential pathway was therefore organized from “concept” to “conceptual cluster,” from cluster to “cross-level relationship,” and from relationship to “framework parameter.” To maintain the coherence and traceability of the framework-formulation process, the concepts and relationships extracted at each stage were cross-checked against the reference sources. This review was undertaken to preserve interpretive consistency, prevent

the imposition of concepts external to the source texts onto the underlying theories, and enable the inferential pathway from the primary sources to the components of the framework to be traced. Perceptual Metageometry, therefore, is not the result of a descriptive aggregation of theories, but the outcome of a sequential process of extraction, comparison, relationship identification, and theoretical abstraction—a process in which individual concepts enter the framework only when their position

therefore, is not a descriptive summary of the literature, but rather a condensed representation of the comparative logic of the study and the basis for the transition from individual theoretical domains to the problem of the relationships among them.

The comparison presented in [Table 1](#) demonstrates that the elements adopted from the theoretical strands belong to different levels of explanation and should not be regarded as a set of adjacent components. Accordingly, the outcome of the literature review is not an assemblage of concepts that can simply be combined, but rather a differentiation of levels, points of connection, and the gaps among them. This conclusion provides the basis for proceeding to the research method, where it is necessary to determine how these distinctions and points of connection can be transformed, through critical theoretical synthesis, into relationships that can be formulated within the framework of Perceptual Metageometry.

Research Methodology and Stages in the Development of the Perceptual Metageometry Conceptual Framework

Given the theoretical nature of the research problem and the study's aim of reorganizing the explanatory capacities of existing theories, the present research employs a critical theoretical synthesis strategy. This strategy enables concepts derived from different theoretical strands to be analyzed not merely as a collection of perspectives, but in terms of their capacities, distinctions, points of overlap, and conceptual relationships. Accordingly, the methodological aim of the study is neither to test an empirical hypothesis nor to develop a statistical model, but rather to formulate the relational logic among different levels of spatial experience. On this basis, the research process was organized into three complementary levels: interpretive analysis of the literature, comparative synthesis of concepts, and theoretical abstraction ([Krippendorff, 2018](#)). The theoretical corpus of the study was purposively constructed on the basis of the research problem. Sources were included in the analytical process if they met at least one of the following three criteria: direct relevance to the explanation of spatial experience; a significant theoretical position within one

of the strands under examination; or a specific role in the development, elaboration, or interconnection of concepts relevant to explaining the human–space relationship. Accordingly, within each strand, foundational texts were used to identify the principal concepts, while subsequent works that developed these foundations were examined to trace the evolution and expansion of those concepts and their points of connection with other levels of experience. Thus, the purpose of constructing the corpus was not to achieve statistical coverage of the literature, but to establish a theoretical body of sources that would enable the comparison of levels of explanation, the identification of conceptual boundaries, and the extraction of relationships among them. The selection of the theoretical strands followed the same logic. Phenomenology, theories of spatial perception and cognition, place memory and identity, and systemic and configurational analyses of space were selected because each formulates a distinct level of the problem of spatial experience: lived experience, perceptual organization, temporal–semantic continuity, and structural conditions, respectively. Environmental psychology was also incorporated into the synthesis because of its focus on reciprocal human–environment interaction, not as an independent layer, but as an intermediary domain for explaining the mechanism of feedback among these levels. Thus, the strands were selected not based on thematic proximity, but according to the distinct level of explanation each provides and its capacity to reveal points of connection among the levels of spatial experience. Following the construction of the theoretical corpus, the analysis was conducted in three sequential stages. In the first stage, the fundamental concepts of each strand were extracted, coded, and clustered through qualitative content analysis. In the second stage, the resulting clusters were comparatively examined in terms of their commonalities, distinctions, explanatory capacities, and explanatory boundaries. At this stage, points at which the explanation of one level of experience became dependent on another level provided the basis for identifying relationships among the clusters. In the third stage, through theoretical abstraction, the identified concepts and relationships were transformed into the parameters and relationships

and relationship to other levels of explanation have been established. To clearly illustrate this pathway, Fig. 1 presents the methodological process through which the Perceptual Metageometry conceptual framework was formulated and the transition from theoretical concepts to the components of the proposed framework.

The outcome of this process provides the basis for formulating a framework in which perception, lived experience, memory, and spatial structure are organized not as independent components, but according to the relationships among them. Accordingly, the following section demonstrates how the theoretical clusters are transformed into the components of the framework and subsequently explains the logic of the relationships among the layers and the quality that emerges from these relationships.

• Formulation of the perceptual Metageometry conceptual framework

Based on the methodological process outlined in the preceding section, the conceptual framework of “Perceptual Metageometry” was formulated as the

outcome of critical theoretical synthesis. This framework conceptualizes spatial experience not as the result of the independent functioning of individual components, but as the outcome of the relational organization among four layers: structural–configurational, perceptual, lived-experience, and memory–semantic. Fig. 2 illustrates the conceptual organization of these layers and the relationships among them.

As Fig. 2 demonstrates, the proposed framework does not result from a simple aggregation of theoretical strands; rather, it is grounded in the reorganization of relationships among different levels of explanation. The structural–configurational layer formulates the relational conditions and spatial organization; the perceptual layer explains how these conditions are perceived and organized in human encounters with the environment; the lived-experience layer explains the quality through which these encounters are realized through embodied presence and action; and the memory–semantic layer formulates the continuity and reinterpretation of experience over time. Thus, each layer explains a distinct level of spatial experience, and

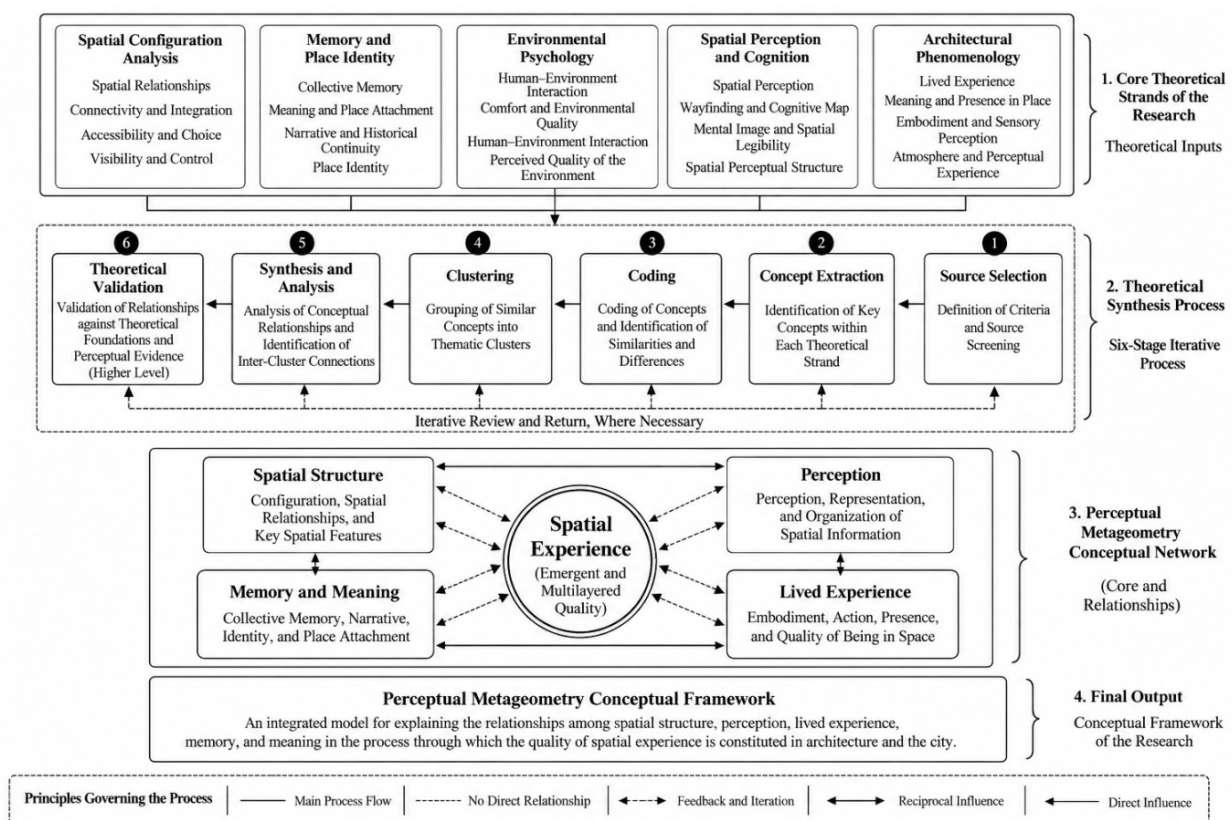


Fig. 1. Methodological process for formulating the perceptual Metageometry conceptual framework based on critical theoretical synthesis. Source: Authors.

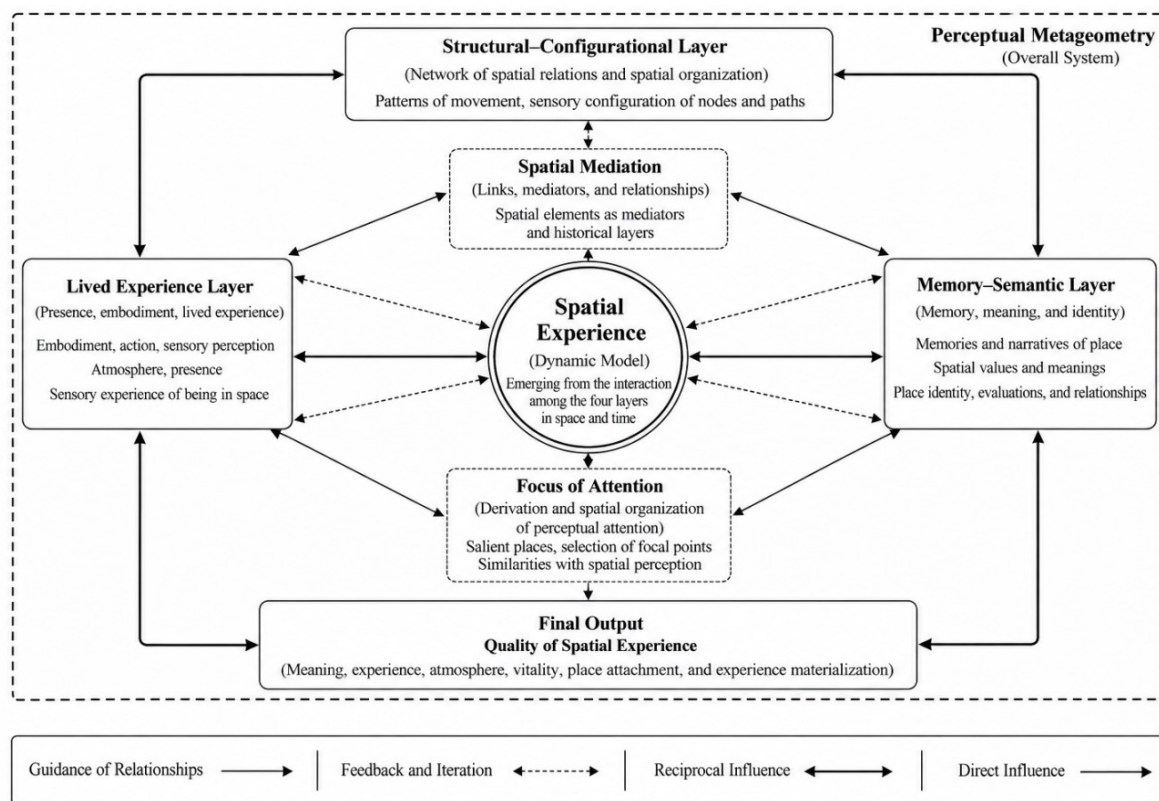


Fig. 2. Perceptual Metageometry conceptual framework and the relational logic of the formation of spatial experience. Source: Authors.

none alone is equivalent to the totality of experience. On this basis, the distinctive contribution of Perceptual Metageometry lies not in adding a new component to the existing literature, but in formulating the relationships among these levels. Accordingly, the object of analysis within the proposed framework is not the independent functioning of the four layers, but the quality that emerges from the organization of the relationships among them and that cannot be reduced to any one of the structural, perceptual, lived, or memory-semantic domains alone. Based on this formulation, the following sections explain the theoretical foundations and the contribution of each of these layers to the framework, after which the mechanisms governing the relationships among them are examined.

Theoretical Foundations

The Perceptual Metageometry framework is not grounded in a single theory; rather, it emerges from a critical synthesis of theoretical strands that explain spatial experience at different levels. Accordingly, the theories selected in this section are revisited not to reiterate the

literature, but to extract the contribution of each strand to the formulation of the framework. On this basis, each subsection identifies the level of spatial experience explained by each theory, the boundary of its explanatory capacity, and the conceptual principle it provides to the framework for establishing relationships with other levels.

• Phenomenology: lived experience and the embodiment of space

Phenomenology is significant to the present framework because it shifts the human-space relationship from the level of observing an external object to that of lived experience. In this reading, spatial quality is neither merely an attribute of the environment nor a product of the human mind; rather, it is realized through the manner in which humans are present in and encounter the world. This principle provides the conceptual foundation for the lived-experience layer of Perceptual Metageometry. Through the concept of "intentionality," Husserl (1970; 1982) demonstrates that consciousness is always directed toward the world and that experience does not arise outside the relationship between subject and

object. Merleau-Ponty (1962) extends this relationship from consciousness to the body, regarding the body not as a passive medium for receiving information, but as the fundamental ground of experiencing the world. Within this formulation, movement, orientation, and bodily presence are integral to the realization of experience; accordingly, space is not merely seen, but lived through movement and the body's multisensory engagement. In Heidegger (1971)'s thought, this logic is extended through the concept of "dwelling," from perceptual experience to the human mode of being in the world. Norberg-Schulz (1980) relates this relationship in architecture to the identity and meaning of place; Pallasmaa (2012), through his critique of the dominance of vision, emphasizes the simultaneous participation of the senses, the body, and sensory memory in architectural experience; and Zumthor (2006) formulates atmospheric quality through the co-presence of material elements, light, sound, texture, and human presence. Despite the differences among these perspectives, their shared contribution to the present study lies in one principle: lived quality is realized through the relationship between environmental characteristics and embodied presence and cannot be reduced to either of these two poles. Embodied cognition brings this principle into closer connection with the mechanisms of perception. Within this approach, perception emerges from the continuous interaction among the body, movement, environment, and cognitive processes (Gallese & Lakoff, 2005; Mallgrave, 2013). The significance of this development for the present framework lies in transforming embodiment from a merely descriptive quality into a link between environmental conditions and the realization of experience. Nevertheless, the structural organization of these conditions and the continuity of experience through memory and meaning remain dependent on other levels of explanation.

Accordingly, what Perceptual Metageometry derives from phenomenology is not a set of independent concepts, but the principle that the spatial relationship is realized through embodied experience. The lived-experience layer formulates the level at which environmental conditions are transformed into realized experience for the human subject through presence, movement, sensation,

and action. This layer does not provide a complete explanation of spatial experience; rather, it constitutes one of the necessary levels of the framework and is linked to the perceptual layer in explaining how environmental conditions are perceived and organized.

• Theories of spatial perception: routes, visual fields, and cognitive structure

Theories of spatial perception are significant to the present framework because they shift the human–environment relationship from the level of lived presence to that of the perception, organization, and representation of spatial information. Within this approach, the environment is not experienced directly and neutrally; rather, it becomes perceptible and legible to humans through vision, movement, wayfinding, and cognitive organization. This principle provides the conceptual foundation for the perceptual layer of Perceptual Metageometry. Through the concept of the mental image of the city, Lynch (1960) demonstrates that environmental legibility depends on the capacity of spatial elements to form a coherent cognitive representation; in this sense, paths, nodes, edges, landmarks, and districts are not merely physical components, but elements that organize cognition and wayfinding. Golledge (1999) extends this relationship through the concept of the cognitive map, regarding movement through space as the outcome of interaction between environmental information and the individual's cognitive organization. Montello (2007; 2017) likewise emphasizes the dynamic nature of spatial perception, whereby changes in bodily position, movement, and visual field continuously reorganize spatial representation. What these perspectives share is the principle that spatial conditions become perceptible experience only when they are organized through perceptual and cognitive mechanisms. Embodied cognition extends this logic beyond purely mental processing. Gallese & Lakoff (2005) formulate perception through the interaction among sensory processes, bodily movement, and the environment, considering the body to be part of the cognitive mechanism. Mallgrave (2013) likewise emphasizes the simultaneity of perceptual, affective, and motor processes in architecture. Studies in neuroarchitecture have also examined the

relationship between environmental organization and processes such as attention, wayfinding, and cognitive load (Eberhard, 2009; Coburn et al., 2017).

The significance of these developments for the present study lies in their transformation of perception into a situated process dependent on the body and movement, thereby clarifying its connection with lived experience. Within the Perceptual Metageometry framework, a specific theoretical principle is derived from this strand: environmental conditions are transformed into perceptible experience through perceptual organization. At this level, routes, visual fields, wayfinding, attention, legibility, and cognitive organization are not independent indicators, but mechanisms that regulate how humans encounter spatial conditions. Perception, however, is not treated within this framework as a closed and independent level; its realization is linked to embodied presence and action, and its effects may persist or be reinterpreted over time through memory and meaning. On this basis, the contribution of perception theory to Perceptual Metageometry is not to provide a complete explanation of spatial experience, but to formulate the mechanism through which environmental conditions are perceived and organized in the course of experience. This level, in turn, enables the theoretical transition to studies of memory and identity, where the focus shifts from how space is perceived to the continuity and reinterpretation of experience over time.

• Collective memory and spatial identity: continuity of meaning within the perceptual Metageometry framework

Theories of collective memory and spatial identity are significant to the present framework because they extend spatial experience beyond the immediate encounter and introduce its continuity and reinterpretation over time into the analysis. In this reading, present experience does not arise in a vacuum; rather, it is interpreted in relation to memory, meaning, and the sociocultural context. This principle provides the conceptual foundation for the memory–semantic layer of Perceptual Metageometry. Through the concept of collective memory, Halbwachs (1992) demonstrates that remembering is not merely an individual process, but is organized within social and spatial frameworks, and that place plays a

role in the stabilization and reinterpretation of collective memories. Assmann (2011) extends this perspective by distinguishing between communicative and cultural memory and relates the continuity of meaning and collective identity to systems of signs, rituals, and sites of memory. From this perspective, the past is not eliminated from the experience of place; rather, through memory, it becomes present in the perception and interpretation of the present. In place studies, this logic has been extended to the level of everyday experience and place identity. Low & Lawrence-Zúñiga (2003) regard place identity as the outcome of the interaction among everyday experience, social relations, and spatial characteristics, and as irreducible to any one of these dimensions alone. Lewicka (2011), in her studies of place attachment, likewise highlights the role of memory, attachment, and continuity of experience in the formation of the human bond with place. The common contribution of these perspectives to the present study is the principle that the meaning of place is formed through the continuity and reinterpretation of experience over time, rather than solely through momentary perception or physical characteristics. Within the Perceptual Metageometry framework, a specific theoretical principle is derived from this strand: spatial experience persists over time through memory and is reinterpreted in subsequent encounters. The memory–semantic layer formulates the relationship between present experience and accumulated experiences, demonstrating how perception and lived experience may persist over time through meaning, attachment, and identity. This temporal continuity, however, is not realized independently of the spatial context; explaining how it is organized therefore requires attention to the structural level of environmental relationships. On this basis, the contribution of theories of memory and identity to Perceptual Metageometry lies in formulating the mechanism through which experience persists and is reinterpreted over time. This level clarifies the temporal connection among spatial experiences and provides the basis for the transition to configurational analysis, where the focus shifts to the structural organization of the conditions within which perception, action, and the continuity of experience occur.

• Systemic analysis and spatial configuration: the relational logic of spatial organization in perceptual Metageometry

Systemic analysis and spatial configuration are significant to the present framework because they shift the focus of analysis from the individual attributes of elements to the organization of relationships among them. At this level, space is understood not as a collection of independent components, but as a system of relationships that organizes patterns of accessibility, movement, visibility, and encounter. This principle provides the conceptual foundation for the structural-configurational layer of Perceptual Metageometry. This logic was developed in Space Syntax theory through the formulation of the environment as a system of spatial relationships. Hillier & Hanson (1984) demonstrated that the characteristics of an individual space are insufficient to explain its position within spatial organization and that the configuration of relationships among spaces must also become an object of analysis. Concepts such as integration, connectivity, choice, and spatial depth enabled this relational organization to be represented and its relationship with movement and social patterns to be examined—an approach further developed by Hillier (1996) in his later work. For the present study, the significance of this strand lies not in the measures themselves, but in a specific theoretical principle: the structural meaning of a spatial position derives from its position within a network of relationships, rather than solely from its individual characteristics. Visibility Graph Analysis (VGA) extends this logic to the visual organization of the environment. Turner et al. (2001) demonstrated that visual fields, visual accessibility, and relationships among visible locations can likewise be analyzed as a network (Turner, 2007). At this point, a specific connection with the perceptual layer emerges: vision and movement are examined in theories of perception from the perspective of human perception, whereas configurational analysis formulates the structural conditions that make seeing and moving possible. Thus, these two levels focus on a common subject, but approach it from different explanatory positions. Complex-systems thinking further extends this relational understanding beyond the static arrangement of elements by formulating

spatial structure as a system composed of reciprocal and multiscale relationships (Batty, 2005; 2009; 2013). The significance of this perspective in the present section lies in establishing the principle that environmental structure cannot be understood independently of the relationships among its components. The discussion of emergence, feedback, and the dynamics arising from these relationships, however, is formulated in the following section as mechanisms linking the layers of the framework.

Within Perceptual Metageometry, a specific theoretical principle is derived from this strand: spatial structure organizes the relational conditions under which experience occurs, but it is not equivalent to experience itself. At this level, integration, connectivity, choice, visual fields, and network relationships provide different conditions for movement, visibility, and encounter; however, the transformation of these conditions into experience requires their connection with perceptual processing, embodied presence, and memory-semantic continuity. Thus, the structural-configurational layer formulates the relational conditions of the environment, but does not, on its own, explain the ultimate quality of spatial experience. With the incorporation of this layer, the four principal levels of the framework are established: the structural conditions of space, the perceptual organization of the environment, the embodied realization of experience, and its memory-semantic continuity. The remaining issue is therefore no longer the identification of these levels, but the explanation of how they are interconnected and reciprocally influence one another. The following section addresses this issue by examining the mechanisms that transform these four levels from a set of adjacent layers into a relational and dynamic system.

• Mechanisms of emergence and dynamics in perceptual Metageometry

Distinguishing the constituent levels of the framework does not yet explain how relationships among them are realized. At this stage, the issue concerns not the nature of each level, but the mechanisms that enable them to reciprocally influence one another. To explain this issue, complexity theory, affordance, and environmental psychology provide the framework with three explanatory

mechanisms: emergence, affordance, and feedback, respectively. These mechanisms do not add new layers to Perceptual Metageometry; rather, they explain the dynamics of the relationships among its levels. Complexity theory provides the basis for explaining emergence. In complex systems, certain qualities arise not from individual components, but from the organization of their multilateral, nonlinear, and feedback interactions (Batty, 2009; 2013). The application of this principle in the present study makes it possible to distinguish between the “existence of components” and the “quality arising from their relationships.” On this basis, emergence refers to a quality whose origin cannot be attributed to any single component and whose explanation requires analysis at the level of relationships. Accordingly, this concept provides the theoretical basis for examining qualities that cannot be inferred from the independent analysis of the constituent levels of the framework. Affordance clarifies how a relationship is realized at the level of possibilities for action. In Gibson (1979)’s theory, possibilities for action are defined in relation to environmental characteristics and human perceptual–motor capabilities; therefore, they are neither merely properties of the environment nor located within the subject independently of it. Norman (2013) likewise highlights the role of user perception and experience in recognizing these possibilities. The significance of affordance for Perceptual Metageometry lies precisely in this relational nature: a spatial condition can become a specific possibility for action only in relation to the capabilities of the human agent. Affordance thus explains the transition from environmental conditions to possibilities for action without reducing this relationship to either the environment or the individual. Environmental psychology adds the mechanism of feedback to this logic. The formulation of place in relation to activity, physical attributes, and mental representation (Canter, 1977), the role of environmental qualities in perceptual evaluation (Nasar, 1992), and the interaction among environment, cognition, and behavior (Gifford, 2014) demonstrate that the human–environment relationship is not unidirectional. Encounters with the environment can alter perception and behavior, while the resulting experience can, in turn, influence subsequent encounters and evaluations.

Feedback therefore makes it possible to understand the relationships within the framework as reciprocal, dynamic, and capable of reconfiguration. Emergence, affordance, and feedback explain three distinct dimensions of the framework’s dynamics: emergence explains the quality arising from the organization of relationships; affordance clarifies how a relationship is realized at the level of action; and feedback explains the continuity and reconfiguration of relationships. This distinction prevents “relationality” from being reduced to a general proposition about Perceptual Metageometry and enables a more precise formulation of how relationships among the levels of the framework operate. To represent this logic, Fig. 3 illustrates the position of the four principal levels and the mechanisms of emergence, affordance, and feedback within the theoretical synthesis framework of Perceptual Metageometry.

Fig. 3 reveals a distinction between two levels of analysis: the level of components, whose theoretical origins were identified in the preceding sections, and the level of relationships, which constitutes the focus of the present section. The significance of Perceptual Metageometry becomes evident at the second level; that is, in addressing the question of whether the analysis of relationships can explain qualities that cannot be inferred from the independent examination of the components. On this basis, the continuity of experience, temporality, and semantic layering are regarded not as predetermined assumptions of the framework, but as qualities emerging from the organization of relationships among the different levels of spatial experience. Accordingly, the explanatory capacity of the proposed framework acquires its significance precisely in explaining this relational level.

Discussion

• Critical reinterpretation of the findings: from distinguishing levels of explanation to the necessity of relational analysis

The critical synthesis of the findings demonstrates that the differences among the theoretical strands examined cannot be attributed merely to differences in their subjects of inquiry; a more fundamental distinction lies in the level at which each approach explains spatial

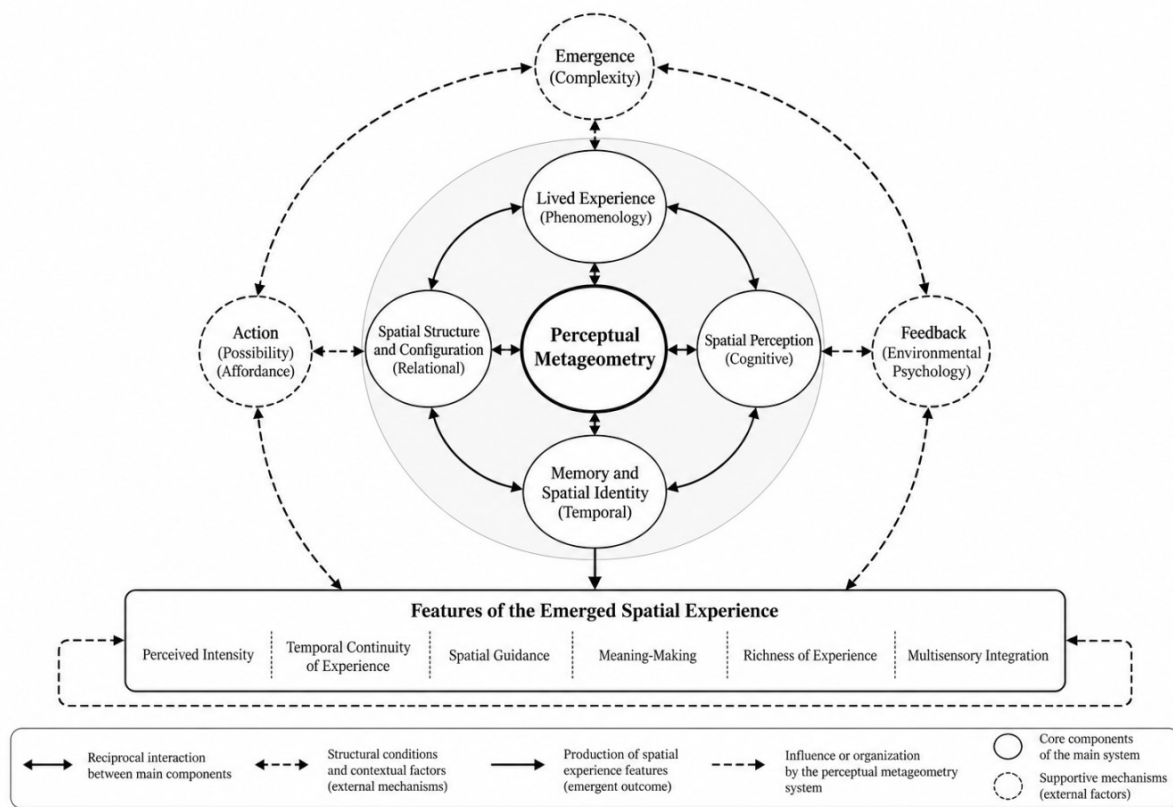


Fig. 3. Theoretical synthesis framework of perceptual Metageometry and the relational logic of the formation of spatial experience. Source: Authors.

experience. Phenomenology addresses the quality through which experience is realized in embodied presence; theories of perception explain the mechanisms through which the environment is perceived and organized; studies of memory and identity examine the continuity and reinterpretation of experience over time; and configurational analysis reveals the structural and relational conditions of the environment. This distinction indicates that none of these approaches necessarily constitutes an alternative to the others; rather, each formulates the problem at a different level of explanation. The significance of this finding becomes evident when the thematic commonalities and explanatory differences among these strands are considered simultaneously. Movement and presence, for example, are associated with the quality of embodied experience in phenomenology, with wayfinding and cognitive organization in theories of perception, and with the structure of accessibility and spatial relationships in configurational analysis. Likewise, place possesses semantic continuity in memory studies, whereas in lived experience it is realized through

presence and encounter. Shared concepts, therefore, do not necessarily carry the same theoretical meaning; rather, they may constitute points of contact among different levels of explanation. It is precisely this condition that enables theoretical connections to be established without eliminating the epistemological distinctions among the approaches. A more significant finding of the study emerges from this comparison: the existing gap is not merely the “absence of a comprehensive theory,” but the lack of a specific analytical level for examining the relationships among existing explanations. Each approach possesses valid explanatory capacity within the boundaries of its own problem; however, qualities that depend on the relationships among spatial conditions, perceptual processing, lived realization, and the temporal–semantic continuity of experience do not fall within the boundaries of any single theoretical domain. The need for a relational framework therefore arises not from the inadequacy of existing theories, but from differences among levels of explanation and the existence of cross-level problems. This conclusion also clarifies the position of Perceptual

Metageometry more precisely. The proposed framework is not intended to replace phenomenology, theories of perception, memory studies, or configurational analysis, nor does it derive its validity from considering any one approach more comprehensive than another. Its distinctive object of inquiry is the relationships among levels that have largely been explained separately within existing approaches. On this basis, the criterion for evaluating the framework is whether the analysis of these relationships can explain a quality of spatial experience that cannot be inferred from the independent analysis of each level. The implications of this shift in the level of analysis are examined in the following section.

• **Theoretical implications: redefining the level of explanation of spatial experience**

The theoretical implication of this finding is a shift in the focus of explanation from individual levels to the relationships among them. At this level, part of the quality of experience depends not on spatial structure, perception, lived experience, or memory alone, but on the manner in which they are related. Perceptual Metageometry therefore takes the level of relationships among existing explanations as its object of inquiry. This shift also changes the meaning of “integration.” In the present study, integration does not imply the merging of concepts or the elimination of theoretical boundaries among approaches, since each strand retains its own object, scale, and explanatory logic. What is reorganized within Perceptual Metageometry is not the theories themselves, but the relationships among their explanatory capacities in addressing a shared phenomenon. Consequently, the coherence of the framework derives not from the similarity of concepts, but from its capacity to explain relationships that arise at the boundaries among these levels. This understanding also has another implication for the concept of spatial experience. Within individual approaches, the quality of experience is often explained in relation to the principal object of the respective theoretical framework; at the relational level, however, certain qualities can be understood only when the interdependence of multiple levels is taken into account. For example, the “continuity of experience” cannot be reduced merely to physical continuity or cognitive organization, just as “semantic

layering” is neither solely a property of memory nor an attribute of the environment. Within the present framework, these qualities are cross-level concepts whose explanation requires examining how multiple levels participate in and reciprocally influence one another. This characteristic delineates the boundary between the descriptive integration of theories and the relational synthesis proposed in this study. From this perspective, the theoretical contribution of Perceptual Metageometry does not lie in proposing a more comprehensive theory in the conventional sense, but in shifting the unit of explanation from the individual component to the relationship among components. This shift allows the validity of existing theories within their respective domains to be preserved while also bringing into analysis phenomena that emerge at the boundaries among those domains. Such an understanding is consistent with interdisciplinary tendencies in architectural research and environment–behavior studies (Groat & Wang, 2013), but moves integration from the juxtaposition of perspectives to the formulation of relationships among them. Accordingly, the theoretical value of the proposed framework should be assessed by its capacity to explain cross-level qualities that are irreducible to any single domain, rather than by the breadth of concepts it encompasses. This criterion provides the basis for examining the analytical capacity of Perceptual Metageometry in the following section, where it is necessary to determine how shifting the unit of explanation from the component to the relationship changes the logic of analyzing spatial experience.

• **Transformation of the logic of spatial experience analysis in light of perceptual Metageometry**

The theoretical implication of the preceding discussion acquires analytical significance when it produces a difference in how the problem is formulated, the unit of analysis is selected, and the findings are interpreted. From this perspective, rather than introducing new variables, Perceptual Metageometry proposes that spatial experience be analyzed at the level of the relationships among spatial conditions, perception, action, lived experience, and semantic continuity. The analytical capacity of the framework therefore lies not in increasing the number of

components, but in changing how data are read and the relationships among them are interpreted. Within this approach, a spatial characteristic alone is not regarded as equivalent to the quality of experience. For example, connectivity, visual field, or legibility are not examined merely as independent attributes of the environment; their analytical significance depends on how they relate to perception, affordance, embodied experience, and the memory–semantic context. Likewise, data concerning perception or memory are not interpreted independently of spatial conditions. The proposed framework thus makes it possible to distinguish between the existence of a characteristic and its role within the relational organization of experience.

This shift also affects the types of analytical questions posed. The issue is not merely how legible, connected, or meaningful an environment is, but how change at one level is accompanied by change at other levels and what quality of experience can be explained as a result of this simultaneity. Such an approach shifts analysis from the independent comparison of indicators toward the examination of patterns of co-occurrence, interdependence, and feedback among them, thereby enabling the study of qualities that are cross-level in nature. Within this framework, concepts such as continuity of experience, perceptual intensity, temporality, and semantic layering must also be understood differently. These concepts are not independent and pre-existing variables, but analytical formulations for interpreting the quality of relationships among different levels of experience. For example, continuity of experience cannot be explained solely by route continuity or cognitive organization; rather, it may result from the simultaneity of spatial continuity, maintained wayfinding, continuity of action, and semantic coherence. The analytical value of Perceptual Metageometry therefore lies in its capacity to identify such qualities at the level of relationships. This shift also affects the level of inference. In a component-centered analysis, the difference between two situations may be explained by differences in one or more characteristics; in a relational approach, however, interpretation focuses on how a set of relationships is organized. Thus, two environments may be similar in terms of a structural indicator yet generate

different qualities of experience because of differences in how that indicator is connected with perception, action, or memory. This explanatory possibility constitutes one of the most important analytical implications of the proposed framework. To systematically formulate this transformation, Table 2 presents the differences between component-centered analysis and the proposed relational logic across five dimensions. The purpose of the table is not to reject or replace existing approaches, but to specify the distinct analytical level that Perceptual Metageometry proposes for the study of spatial experience.

Table 2 demonstrates that the transformation proposed by Perceptual Metageometry lies not in replacing existing tools or indicators, but in changing the manner in which they are used and interpreted. A structural, perceptual, or semantic indicator retains its analytical value within the proposed framework; however, its meaning is not confined solely to its individual value or state, and its relationship with other levels also becomes an object of analysis. On this basis, the framework can provide a foundation for the development of empirical studies in which cross-level qualities and the manner in which they emerge from relationships among components can be tested. Accordingly, the analytical contribution of this section should be understood as the formulation of a testable logic for studying relationships, rather than as a claim to provide a complete or validated analytical tool. The identification of operational indicators, the measurement of relationships, and the evaluation of the framework's applicability to real-world cases still require further development and empirical validation.

• Research horizons and further development of the perceptual Metageometry framework

The theoretical and analytical implications of the framework provide avenues for its operationalization, testing, and the delineation of the boundaries of its validity in future research. One such avenue is to test the framework through multimethod and multiscale studies in which structural, perceptual, behavioral, and temporal evidence is examined within a common research design. In this approach, the aim is not to aggregate methods, but to evaluate the relationships among different levels of experience and to examine the degree of convergence

Table 2. Analytical formulation of the transformation in the logic of spatial experience analysis within the perceptual Metageometry framework. Source: Authors.

Dimension of transformation	Component-centered analysis	Analysis in perceptual Metageometry	Analytical implication	Research capacity
Unit of analysis	Characteristics or components are examined primarily in isolation.	Relationships and the manner in which components are organized in relation to one another are also subjected to analysis.	Distinguishing between the “existence of a characteristic” and its “role in experience”	Designing studies based on relational patterns
Nature of the question	The question focuses on the state or role of a component.	The question focuses on how multiple levels are related in the formation of the quality of experience.	Shift from describing components to explaining relationships	Formulating cross-level research questions
Logic of explanation	Relationships among characteristics are interpreted within the boundaries of the relevant theoretical framework.	Interaction, emergence, and feedback among different levels are taken into account.	Enabling the interpretation of qualities irreducible to a single component	Developing relational hypotheses and models for subsequent testing
Level of inference	Findings are interpreted primarily at the level of the characteristics examined.	Findings are interpreted on the basis of patterns of organization among multiple levels.	Identifying the distinction between component-level similarity and experiential difference	More precise comparison of architectural situations and cases
Scope of analysis	Analysis is generally conducted from the perspective of one or more specific levels.	Structural, perceptual, lived-experience, and temporal levels can be interrelated.	Multilevel interpretation without eliminating distinctions among levels	Providing a basis for the development of multilevel and empirical studies

or divergence among the evidence. Furthermore, the transferability of the framework across different spatial typologies, scales, and contexts must be empirically tested and cannot be assumed in advance. Another avenue involves drawing on interdisciplinary studies and analytical tools to operationalize the proposed relationships. Connections with fields such as cognitive science, environmental psychology, heritage studies, data science, and digital modeling can provide a basis for translating theoretical concepts into measurable variables and indicators and for testing them in real-world settings. At this level, tools such as eye tracking, virtual reality, network analysis, and digital modeling can be employed in accordance with the research question; however, their analytical value depends on the precise operational definition of the relationships and the design of validation mechanisms. Overall, the future development of Perceptual Metageometry lies in the transition from theoretical formulation to empirical testability. Future research should determine the extent to which the proposed relationships can be observed and measured in real-world cases, which qualities emerging from these relationships can be operationalized, and the extent of the framework’s validity across different contexts and scales. Fig. 4 represents these developmental pathways and the relationships among them as a conceptual network.

Fig. 4 demonstrates that multimethod, multiscale, and interdisciplinary studies, as well as the development of analytical tools, are not independent pathways; rather, they can be integrated in the design of empirical studies to operationalize, test, and determine the scope of validity of the framework.

• **Boundaries of validity and scope of application of the perceptual Metageometry framework**

The Perceptual Metageometry framework was formulated through critical theoretical synthesis; therefore, its validity in the present study is conceptual and explanatory and should not be regarded as empirical confirmation of the proposed relationships or as a universal model applicable to all forms of spatial experience. Its scope of application specifically concerns problems in which the relationships among spatial structure, perception, lived experience, and memory constitute the object of analysis. Accordingly, the proposed framework does not replace the specialized theories and tools of any of these domains; rather, it takes the level of relationships among them as its object of explanation. Furthermore, concepts such as emergence, feedback, and cross-level qualities have been formulated theoretically in the present study and have not yet been translated into established empirical indicators. Therefore, the framework’s empirical validity, its transferability

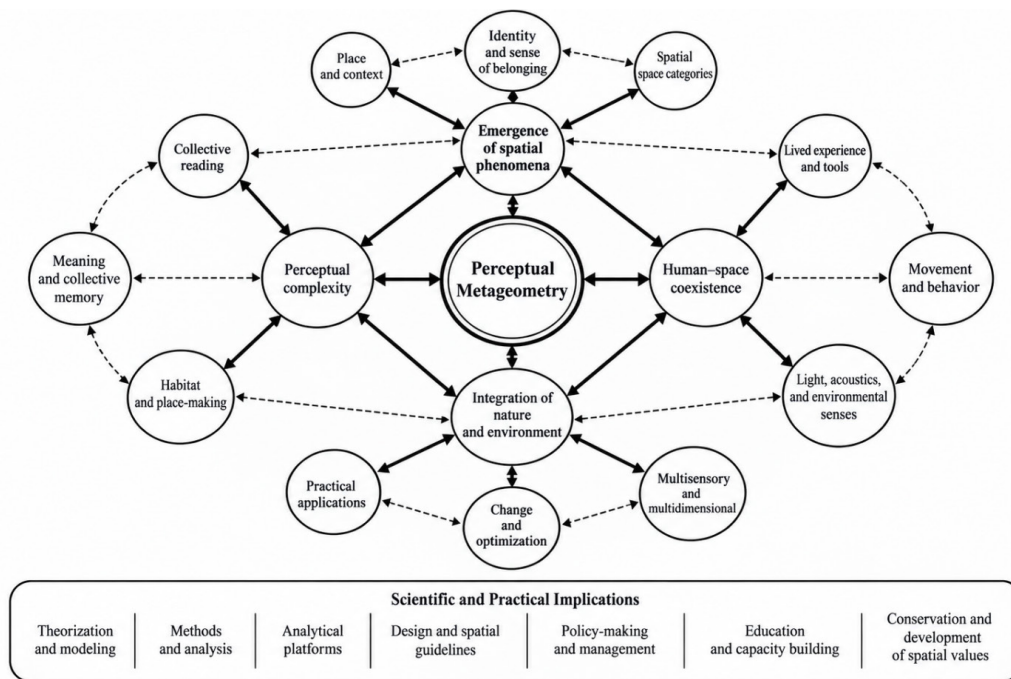


Fig. 4. Conceptual network of the development horizons of perceptual Metageometry and pathways for the expansion of future research. Source: Authors.

across scales and cultural contexts, and its capacity to explain qualities that cannot be inferred from the independent examination of individual components must be tested in subsequent studies. On this basis, Perceptual Metageometry, in its current state, should be regarded as a theoretical framework for formulating the relationships among the levels of spatial experience, rather than as a predictive model or a measurement tool whose empirical validity has already been established.

Conclusion

The present study demonstrated that the principal theoretical strands explaining spatial experience, despite sharing an acknowledgment of the active role of humans and the environment, operate at different levels of explanation: phenomenology reveals the quality of presence and embodied experience; theories of perception explain the perception and cognitive organization of the environment; studies of memory and identity account for the continuity and reinterpretation of experience over time; and configurational approaches formulate the structural and relational conditions of space. The distinction among these approaches therefore arises not from a conflict in their subject matter, but from differences

in their levels of explanation, and their principal limitation becomes evident when each level is examined independently of its relationships with the others. The critical synthesis of these levels demonstrated that what cannot be derived from any of them independently is an explanation of how the structural conditions of space are transformed into an experience that is perceived, lived, and endowed with temporal and semantic continuity. Spatial structure alone does not determine experienced quality; perception without embodied presence and action does not fully explain the lived quality of experience; and ongoing experience without memory does not reveal the continuity and reinterpretation of its meaning over time. Conversely, linking these levels demonstrates that a spatial characteristic acquires an experiential role only in relation to how it is perceived, the affordances it provides, embodied experience, and its memory–semantic context. For this reason, even environments with similar structural characteristics can generate different experiences as a result of differences in the organization of these relationships. This relational quality constitutes precisely the level of explanation that cannot be derived from the independent examination of the components. On this basis, the study's response to its main research question lies not in adding

a new component to theories of spatial experience, but in shifting the unit of explanation from the “component” to the “relation.” Perceptual Metageometry formulates this level through three distinct mechanisms: “emergence” explains a quality that cannot be reduced to any single component; “affordance” clarifies how the relationship between human capabilities and environmental conditions is realized; and “feedback” explains the continuity and reconfiguration of relationships throughout the course of experience. Thus, the proposed synthesis does not merely juxtapose four theoretical domains; rather, it demonstrates that the quality of spatial experience emerges from the organization of the relationships among them. The contribution of the study, therefore, lies in formulating spatial experience as a quality emerging from the relational organization among structural conditions, perceptual processes, the embodied realization of experience, and its memory–semantic continuity—a quality that resides neither in spatial structure, nor in perception, nor in lived experience, nor in memory alone, and can be explained only at the level of the relationships among them. Accordingly, in its current state, Perceptual Metageometry should be regarded as a theoretical framework for explaining this interdisciplinary level, rather than as an alternative theory to existing approaches or a model whose empirical validity has been established. Establishing the empirical validity and transferability of this formulation across different spatial typologies, scales, and cultural contexts requires the proposed relationships to be operationalized and tested in future research.

Declaration of Conflicting Interests

The authors declare that there is no conflict of interest for them in conducting this research.

References List

- Assmann, J., & Czaplicka, J. (1995). Collective memory and cultural identity. *New German Critique*, 65, 125–133. <https://doi.org/10.2307/488538>
- Assmann, J. (2011). *Cultural memory and early civilization: Writing, remembrance, and political imagination*. Cambridge University Press.
- Batty, M. (2005). *Cities and complexity: Understanding cities with cellular automata, agent-based models, and fractals*. MIT Press.
- Batty, M. (2009). Cities as complex systems: Scaling, interaction, networks, dynamics and urban morphologies. In R. A. Meyers (Ed.), *Encyclopedia of complexity and systems science* (pp. 1041–1071). Springer. <https://discovery.ucl.ac.uk/id/eprint/15183/1/15183.pdf>
- Batty, M. (2013). *The new science of cities*. MIT Press. <https://doi.org/10.7551/mitpress/9399.001.0001>
- Böhme, G. (2017). *Atmospheric architectures: The aesthetics of felt spaces* (A.-C. Engels-Schwarzpaul, Ed. & Trans.). Bloomsbury Academic.
- Canter, D. (1977). *The psychology of place*. Architectural Press.
- Coburn, A., Vartanian, O., & Chatterjee, A. (2017). Buildings, beauty, and the brain: A neuroscience of architectural experience. *Journal of Cognitive Neuroscience*, 29(9), 1521–1531. https://doi.org/10.1162/jocn_a_01146
- Eberhard, J. P. (2009). Applying neuroscience to architecture. *Neuron*, 62(6), 753–756. <https://doi.org/10.1016/j.neuron.2009.06.001>
- Gallese, V., & Lakoff, G. (2005). The brain’s concepts: The role of the sensory-motor system in conceptual knowledge. *Cognitive Neuropsychology*, 22(3–4), 455–479. <https://doi.org/10.1080/02643290442000310>
- Gibson, J. J. (1979). *The ecological approach to visual perception*. Houghton Mifflin.
- Gifford, R. (2014). *Environmental psychology: Principles and practice* (5th ed.). Optimal Books.
- Golledge, R. G. (Ed.). (1999). *Wayfinding behavior: Cognitive mapping and other spatial processes*. Johns Hopkins University Press.
- Groat, L. N., & Wang, D. (2013). *Architectural research methods* (2nd ed.). Wiley.
- Halbwachs, M. (1992). *On collective memory* (L. A. Coser, Ed. & Trans.). University of Chicago Press.
- Heidegger, M. (1971). *Poetry, language, thought* (A. Hofstadter, trans.). Harper & Row.
- Hillier, B. (1996). *Space is the machine: A configurational theory of architecture*. Cambridge University Press.
- Hillier, B., & Hanson, J. (1984). *The social logic of space*. Cambridge University Press. <https://doi.org/10.1017/CBO9780511597237>
- Husserl, E. (1970). *The crisis of European sciences and transcendental phenomenology: An introduction to phenomenological philosophy* (D. Carr, Trans.). Northwestern University Press.
- Husserl, E. (1982). *Ideas pertaining to a pure phenomenology and to a phenomenological philosophy: First*

book (F. Kersten, Trans.). Martinus Nijhoff.

- Krippendorff, K. (2018). *Content analysis: An introduction to its methodology* (4th ed.). SAGE.
- Lewicka, M. (2011). Place attachment: How far have we come in the last 40 years? *Journal of Environmental Psychology*, 31(3), 207–230. <https://doi.org/10.1016/j.jenvp.2010.10.001>
- Low, S. M., & Lawrence-Zúñiga, D. (Eds.). (2003). *The anthropology of space and place: Locating culture*. Blackwell.
- Lynch, K. (1960). *The image of the city*. MIT Press.
- Mallgrave, H. F. (2013). *Architecture and embodiment: The implications of the new sciences and humanities for design*. Routledge.
- Merleau-Ponty, M. (1962). *Phenomenology of perception* (C. Smith, Trans.). Routledge & Kegan Paul.
- Montello, D. R. (2007). The contribution of space syntax to a comprehensive theory of environmental psychology. In A. S. Kubat, Ö. Ertekin, Y. İ. Güney, & E. Eyüboğlu (Eds.), *Proceedings of the 6th International Space Syntax Symposium* (Paper iv-02). Istanbul Technical University.
- Montello, D. R. (2017). Cognition and spatial behavior. In D. Richardson, N. Castree, M. F. Goodchild, A. Kobayashi, W. Liu, & R. A. Marston (Eds.), *The international encyclopedia of geography: People, the Earth, environment and technology*. Wiley. <https://doi.org/10.1002/9781118786352.wbieg0498>
- Nasar, J. L. (Ed.). (1992). *Environmental aesthetics: Theory, research, and applications*. Cambridge University Press.
- Norberg-Schulz, C. (1980). *Genius loci: Towards a phenomenology of architecture*. Rizzoli.
- Norman, D. A. (2013). *The design of everyday things* (Revised and expanded Ed.). Basic Books.
- Pallasmaa, J. (2012). *The eyes of the skin: Architecture and the senses* (3rd ed.). Wiley.
- Till, J. (2009). *Architecture depends*. MIT Press.
- Tuan, Y.-F. (1977). *Space and place: The perspective of experience*. University of Minnesota Press.
- Turner, A. (2007). To move through space: Lines of vision and movement. In *Proceedings of the 6th International Space Syntax Symposium* (pp. 037.01–037.12). Istanbul Technical University.
- Turner, A., Doxa, M., O'Sullivan, D., & Penn, A. (2001). From isovists to visibility graphs: A methodology for the analysis of architectural space. *Environment and Planning B: Planning and Design*, 28(1), 103–121. <https://doi.org/10.1068/b2684>
- Zumthor, P. (2006). *Atmospheres: Architectural environments, surrounding objects*. Birkhäuser.

COPYRIGHTS

Copyright for this article is retained by the author(s), with publication rights granted to the Bagh-e Nazar Journal. This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/>).



HOW TO CITE THIS ARTICLE

Shaeri, Z., Majidi, M., & Ebrahimi, H. (2026). Perceptual Metageometry: A Relational Framework for the Formulation and Analysis of Spatial Experience. *Bagh-e Nazar*, 23(161), 5-22.

DOI: [10.22034/bagh.2026.582541.6048](https://doi.org/10.22034/bagh.2026.582541.6048)

URL: https://www.bagh-sj.com/article_253972.html?lang=en

