

Interpretations of Iranian Architecture from a Synchronic Linguistics Perspective

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ABSTRACT: Extensive studies on Iranian architecture have been conducted since the late Qajar period. However, many aspects remain unexplored. One of the main challenges in this field is the lack of a systematic approach to architectural analysis. Most previous research has been descriptive, focusing on the physical characteristics of buildings. Yet architecture goes beyond its physical elements; it consists of complex structures that require theoretical and conceptual analysis. As a tool for understanding architecture, the theory allows for a deeper examination of structures, meanings, and cultural transformations. Since the 1960s, linguistics has emerged as a significant architectural theory paradigm due to the renewed focus on meaning in architecture. Language and architecture are manifestations of culture—while language reflects culture, it also organizes other cultural domains. The structural similarities between language and architecture have led architects and theorists to adopt linguistic theories for "understanding architecture" and finding "design solutions." This article approaches architecture as a language and, inspired by how linguists study language through various approaches, proposes methodologies for the "understanding of architecture." It draws on Ferdinand de Saussure's classification, particularly the synchronic approach, which analyzes language at a specific moment. The scope of this research is centered on the applications of the synchronic approach in understanding Iranian architecture. Through a comparative study of linguistic and architectural methodologies, the article demonstrates how synchronic linguistic concepts and methods can be applied to analyze Iranian architecture's structures, meanings, and spatial systems, contributing to developing a theoretical model for its study.

Keywords: *Understanding Iranian Architecture, Iranian Architectural Studies, Synchronic Linguistics, Linguistics.*

INTRODUCTION

Over the years, there has been extensive research conducted on Iranian architecture, spanning from the Qajar period to the present, by both Iranian and foreign scholars. However, many aspects of Iranian architecture remain unexplored. Furthermore, the methodological study of Iranian architecture has not received adequate attention, and researchers often face challenges due to the inadequacy of historical materials. These shortcomings highlight the need for a more systematic approach in Iranian architectural research. Although the need for understanding Iranian architecture is widely recognized in academic studies, the impact and essential need for this understanding can be discerned from the state of contemporary Iranian architecture. Iranian architecture, as a manifestation of culture, despite its rich history and thousands of years of continuity, has, for several decades, been detached from its historical continuity, as stated by many experts. The

architectural works of contemporary Iran generally remain disjointed from their past, with minimal evidence of an identity that does not align well with its geographical and cultural context.

Despite the efforts of some architects, contemporary Iranian architecture still confusion between superficial interpretations of the past and the allure of Western patterns. Still, we observe that architecture is being presented at a very superficial level. In describing today's Iranian architecture, one can still use Giedion's expression that "fashion-oriented" architecture is prevailing in contemporary architecture today (Giedion, 2006, 5). Today's people and architects seem incapable of understanding the hidden meaning of traditional architecture in Iran. In other words, It is neither familiar with their architecture nor possess a profound understanding of Western architecture. As a result, contemporary architecture in Iran generally has an unfamiliar and disproportionate appearance compared to the

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past. However, such a rupture is not evident in the Persian language, and despite some criticisms, both written and spoken language can still establish a rational and emotional connection between the past and the present. Therefore, if we believe that drawing from past architecture's ancient and valuable experiences can benefit contemporary architecture, utilizing the models of understanding and research in the Persian language can be highly helpful.

What enables a culture and its various tangible and intangible manifestations to progress continuously is the ability to absorb the past and transform it following the conditions of the present time (Curtis, 1996, 688). When a civilization maintains its connection with the past, there is a reason to emulate past styles, as the past is always alive and adapts to new conditions (Giedion, 2006, 10). One factor contributing to the return of this architecture to its historical continuity is an understanding of the deep-rooted cultural rules and characteristics that have remained relatively constant over the years and, in each period, have emerged in accordance with the characteristics of the time. Discovering these constant "factors," understanding them, and distinguishing them from variable architectural factors require profound understanding (Giedion, 2006, 36,37). This understanding requires an appropriate study method.

Descriptive studies, which focus on gathering the physical and external features of buildings, often create formal and historical connections that are not sufficiently effective and cannot incorporate diverse perspectives from architects and scholars. In contrast, as an analytical and conceptual tool, theory provides a foundation for a broader and deeper understanding of architectural characteristics and developments. In this context, linguistics, especially in recent decades, has played a prominent role in the theories of social sciences. This field has profoundly impacted as a model for anthropology, aesthetics, and philosophy theorizing. However, architecture has drawn on linguistics to a relatively limited extent. Mario Gandelsonas identifies one of the reasons for this as the limited knowledge of architecture in linguistics and the challenge of transferring these concepts into architecture (Gandelsonas, 1998, 114).

Linguistic theories are primarily realistic in nature, focusing on how languages function and the relationships between them. These theories specifically address the operational mechanisms of language and its communications, relying on observations and empirical analyses. In contrast, theories tend to have a more prescriptive and abstract nature in architecture. Modern architectural theories generally focus on what architecture should be rather than what it is or how it has evolved.

Although the Persian language, another manifestation of Iranian culture, faces contemporary challenges, it maintains its continuity with its roots (Mohit-Tabatabai, 1971, 570). Many literary scholars and researchers of Persian literature have worked to preserve and elevate the Persian language, and numerous linguists have studied it using various methods. In contrast, Iranian architecture has no qualitative and quantitative research framework.

Language and architecture are manifestations of culture, and commonalities have led to the use of linguistic methods and approaches in architecture to have a relatively long history. Just as language is a structured system composed of elements that facilitate communication

among humans and convey meaning, architecture is also a structured system with the responsibility of establishing communication among humans and representing how humans live on Earth. Both manifest the cultural characteristics, thoughts, and traits of the people of a land, undergoing changes over time with cultural transformations and deeply interconnected, influencing each other. These similarities have led many researchers and theorists to take on the analogy of language and architecture.

Researchers and architects, with various perspectives, aims, and intentions, have employed linguistic methods and approaches. Some theorists have introduced architecture as a language and compared architecture and language. Similarly, some designers and architects have attempted to use linguistic theories in architectural design. In the 1970's, the idea of "architecture as language" was introduced. Since then, numerous researchers have utilized linguistics theories and analogies between architecture and language in the "understanding of architecture" and "architectural design."

This article assumes that language study methods can be employed to understand Iranian architecture in its historical tradition, and this understanding will lead to positive changes in the perception of current and future architecture. Therefore, the article explores the applications of synchronic linguistic studies in understanding architecture through an analytical-comparative method and introduces the academic frameworks and approaches for understanding Iranian architecture. To date, linguistic readings have also been used to understand Iranian architecture, with some readings receiving more attention than others, while some have been neglected. This research aims to highlight the overlooked areas in the study of Iranian architecture by grounding its approach in linguistic theories.

MATERIALS AND METHODS

This research employs a qualitative and analytical-comparative approach to examine the applications of synchronic linguistics in understanding Iranian architecture. To this end, the study first explores the theoretical foundations of synchronic linguistics and its three main approaches: formalist, functionalist, and cognitive linguistics. In this stage, by relying on credible sources, the research aims to clarify the key concepts of these fields and establish a theoretical framework for studying Iranian architecture based on these approaches.

After developing the theoretical framework, the structure and characteristics of Iranian architecture are compared with the principles of synchronic linguistics to elucidate the relationship between linguistic rules and spatial patterns. Through a comparative analysis, this research methodology enables the study of Iranian architecture as a linguistic system, contributing to a deeper understanding of its formation and transformation patterns. Finally, based on the findings of the comparative analysis, a comprehensive theoretical framework will be developed to enable the study of Iranian architecture from the perspective of synchronic linguistics.

Research Background

Related studies on this topic can be categorized into two groups: first,

those discussing the necessity of studying architecture from a linguistic perspective or applying linguistic concepts in architectural analysis; second, those that have utilized synchronic linguistics to understand Iranian architecture.

The analogy between architecture and language dates back to the works of Vitruvius and became one of the central principles of architectural theory during the Renaissance through the efforts of humanists. This analogy was employed in design and as a tool for classifying and critiquing architecture. Architectural styles were compared to literary styles, architecture was likened to rhetoric, the evolution of architectural style was seen as the gradual development of a "language," and the nature of architectural composition was analyzed through linguistic structures. Within this framework, architectural elements and components played the same role as words in sentences. Mastery of the Latin language during the Renaissance strengthened architects' social and professional status, and classical rhetorical terms found their way into the categorization of visual arts experiences. This was less related to the essence of architecture itself and more a response to the identity crisis of architects within that period's intellectual and social context (Clarke & Crossley, 2000, 1-5).

In the 20th century, this approach was revived with the emergence of linguistic paradigms. In the 1960s, interest in meaning and symbolism in architecture increased, and architects sought to apply linguistic knowledge to architecture through the analogies that language shares with architecture (Agrest & Gandelonas, 1996, 110). This led to the emergence of architectural thinking as a language, and subsequent researchers have explored the connections between architecture and language in various ways.

John Summerson stated in 1964, in *The Classical Language of Architecture*, that classical architecture is a type of visual language with its own set of grammatical rules, much like any other language. Summerson aimed to convey the precise instructions of this architectural language in the most straightforward way possible (Summerson, 1964). Bruno Zevi published *The Modern Language of Architecture* a decade later, in which he emphasized the importance of language in architecture, comparing it to the necessity of language for communication and thought (Zevi, 1978). Similarly, the British architectural historian and theorist Charles Jencks has explored the relationship between architecture and language in *The Language of Post-Modern Architecture*. Jencks argues that postmodernism represents a shift in architectural language, away from the modernist emphasis on functionalism and towards a more expressive and eclectic approach that draws on various cultural and historical references (Jencks, 1977). In 1977, Christopher Alexander created a language for design in *A Pattern Language: Towns, Buildings, Construction*. According to Alexander, a pattern language is a set of design principles that can be used to create functional and meaningful buildings (Alexander, 1977). Also, Peter Eisenman attempted to apply Noam Chomsky's theory of "syntactic structures" to the design of houses. Chomsky's theory, developed in linguistics, proposes that language has an innate, underlying structure that can be analyzed and understood through rules or principles. Eisenman sought to apply this idea to architecture, arguing that buildings could also be understood by a set of underlying rules or principles that govern their design. In *House*

X, published in 1982, Eisenman presented a design for a house that he claimed was based on Chomsky's syntactic structures (Eisenman, 1982).

Donald Preziosi used a linguistic comparison to describe architecture in *Architecture, Language, and Meaning: The Origins of the Built World and its Semiotic Organization*. He drew a parallel between architectural components and linguistic elements such as syllables, phonemes, words, morphemes, phrases, sentences, texts, and discourses (Preziosi, 1979). Martin Donougho, in "The Language of Architecture," explored the relationship between language and architecture and how linguistic theories can be applied to architecture. He then tried to explain some theories of linguistics and how they are applied in architecture (Donougho, 1987). Mario Gandelonas, in "Linguistics in Architecture," discusses the relationship between language and architecture and criticizes the use of linguistics in architecture by some architects and scholars. In particular, he criticized Peter Eisenman's use of linguistics in his design approach, which he argued was overly simplistic and failed to account for the complexity of language and its relation to architecture. Gandelonas argued that a more nuanced and interdisciplinary approach was needed to understand the relationship between language and architecture fully. He suggested that architects draw on insights from fields such as anthropology, semiotics, cognitive psychology, and linguistics to develop a more holistic understanding of how language and culture shape architectural form and meaning (Gandelonas, 1998).

Georgia Clarke and Paul Crossley explored the relationship between language and architecture in *Architecture and Language: Constructing Identity in European Architecture*. Through a collection of essays, they investigated the analogy between language and architecture and its theoretical significance, considering the various historical contexts in which it emerged. The book offers an in-depth analysis of the language-architecture connection and its implications (Clarke & Crossley, 2000). Adrian Forty, in *Words and Buildings: A Dictionary of Modern Architecture*, delved into the impact of language on our perception of architecture and how architects utilized language to express their concepts. He suggested that architecture constitutes a distinct language with its own rules and terminology and that comprehending it is critical to recognizing and comprehending architectural composition (Forty, 2000). Thomas A. Markus and Deborah, in *The Words Between the Spaces: Buildings and Language*, argued that language is a topic that has been neglected in the discussion of architecture even though it plays a crucial role in shaping the built environment. Markus and Cameron explore the many ways in which language and architecture intersect, from how buildings are described and interpreted to how language is used to articulate design decisions and communicate with users of the built environment. They argued that by paying closer attention to the role of language in shaping architecture, we can gain a deeper understanding of the cultural and social contexts in which buildings are created and can develop more effective design strategies that take into account the complex relationships between language, culture, and architecture (Markus & Cameron, 2002). Jason Rhys Parry analyzed different ideas about the connection between language and architecture in "Primal Weaving: Structure and Meaning in Language and Architecture" (Parry, 2017), and Olena Remizova proposed a

theoretical framework for architectural language and described its semantic, morphological, and syntactic structures in "The Structure of the Architectural Language" (Remizova, 2016).

In Iran, Klaus Herdeg is one of the scholars who has used a formal approach in his analyses of Iranian architecture. In *Formal Structure in Islamic Architecture of Iran and Turkistan*, he explores the form in Iranian and Turkistani architecture (Herdeg, 1991). Abulazia and Qezelbash, in *The Alphabet of the Body of the Traditional House of Yazd*, studied the architectural knowledge of the traditional house, and by describing the tools and methods of the traditional architect and the rules of house construction, they reconstructed the traditional house in the area of Mosalla neighborhood of Yazd (Abulazia & Qezelbash, 2007). Faramarz Parsi also expressed the similarity between language and architecture in "Design Method in Historical Architecture of Iran" and tried to explain the language of Iranian architecture By defining the words, patterns, and adjectives of space in Iranian architecture (Parsi, 2012).

From studies that have used synchronic linguistic approaches to understand Iranian architecture: Hasani and Norouz Borazjani, in "A Specification of a New Pattern of Shape Grammar in Architecture of Today's Houses Case study: Qajar houses in Tabriz and Tehran," attempted to use shape grammar to develop a pattern that can be used in contemporary houses by examining the structural and symbolic characteristics of houses in Tehran and Tabriz during the Qajar period (Hasani & Nourouz Borazjani, 2018). Additionally, in "Re-read of Court's Form and Related Spaces with Shape Grammar Case Study, 100 Houses of Qajar Dynasty in Kashan City", Hasani and others identified the relationships between open, closed, and semi-open spaces in one hundred Qajar houses in Kashan using shape grammar, to achieve a variety of designs based on these relationships (Hasani et al., 2016).

Seyed Amir Hosseini and Mohammad Reza Bemanian, in "Investigation of the formal structure and spatial relations of 19 historical houses of Kashan", have developed a shape grammar for traditional houses in Kashan. By examining and analyzing the formal and spatial aspects of 19 houses selected through purposive sampling, they proposed minimal rules for generating Kashan houses' formal and

spatial structures. This grammatical framework is accomplished in four stages: the first stage involves dividing the land parcel and building orientation, the second stage entails generating the macro-shaped structure, the third stage focuses on producing formal pattern templates, and the fourth stage involves generating spatial relationships within the shape patterns (Hosseini & Bemanian, 2022, 8). Additionally, Hosseini and others, in "Decoding Architectural Elements Using the Grammar of Form (Typology of Spaces in 64 Historical Houses from Kashan, Yazd, and Isfahan)", based on the grammar of form in the historical houses of Kashan, conducted a typological study of the micro-spaces in 64 historical houses in the cities of Yazd, Isfahan, and Kashan. (Hosseini et al., 2025).

Synchronic approach in Linguistics

Linguistics is a scientific discipline that studies language using scientific methods. Linguists have studied language from various perspectives in different periods. In the 18th and 19th centuries, most linguistic studies were comparative and historical. In the 20th century, Ferdinand de Saussure introduced a new field of linguistic studies. One of Saussure's significant contributions was distinguishing between two approaches to studying language: diachronic and synchronic. Unlike his predecessors, who focused on historical or comparative perspectives in studying language, Saussure emphasized the synchronic aspect, examining language structure at a specific time. After Saussure, different linguistic schools emerged, all inspired by Saussure's theories but defined and studied language from a particular linguistic aspect. The three dominant approaches in this field are the formalist, functionalist, and cognitive approaches. Each of these approaches has subcategories, and their common theme is the perception of language as a system of structure and rules, a system of communication, and a cognitive system, respectively (Table 1) (Dabir-Moghaddam, 2008, 9). This section will concisely overview three linguistic methods: formalist, functionalist, and cognitive. The focus of this overview will be on highlighting the characteristics that are relevant to comprehending architecture as much as feasible.

Table 1: Diachronic and synchronic linguistics

Approaches		Properties
Diachronic	Historical Linguistics	Studying the changes in language elements
	Typology	Study of character, spirit, and particularity of languages Classifies languages according to their structural features
Synchronic	Formal Linguistics	Discovering formal and visual relationships, regardless of human relationships and social themes
	Functional Linguistics	The importance of discourse, semantic forms, and situational context Emphasizing the social nature of language
	Cognitive Linguistics	Emphasizing the psychological aspect of language Investigating the relationship between human language, their mind, and social and physical experiences

Formal Linguistics

Formal Linguistics is an approach in linguistics that studies language as a formal system, considering it as a mental and independent phenomenon from the body and human experiences. This linguistic approach considers language a structured system (Rasekh-Mahand, 2007, 181; Alavi-Moghaddam, 2005, 80). Although there are various opinions among formal linguists, without any doubt, formalism began with Chomsky, and its major branch is still under his influence. Chomsky's linguistic theory is called Generative Grammar or Transformational Grammar. In his theory, he emphasizes the mental ability of individuals to generate sentences using their unconscious linguistic knowledge. This perspective contrasts the behaviorist view that considers language learning a result of communication (Rasekh-Mahand, 2021, 74-82).

The primary objective is to describe universal grammar, which is humans' innate knowledge. Chomsky views the discovery and explanation of these universal principles as the main goal of linguistics. In generative grammar, the most productive and significant component of language is assumed to be syntax, and other parts of language are interpreted based on it. The most important goal is to describe universal grammar, an inherent knowledge all humans share. Chomsky considers discovering and explaining these shared features as the goal of linguistics (Alavi-Moghaddam, 2005, 81; Dabir-Moghaddam, 2008, 105; Rasekh-Mahand, 2021, 98). Another goal of formal linguistics is to patternize language using a precise grammar derived from the existing structuralism in computer science, logic, and mathematics. Using mechanical tools and processes based on these rules generates all possible syntactic sentences in a language and prevents the creation of non-syntactic sentences (Ardebili, 2013, 42).

According to Chomsky, grammar consists of four types of rules: deep structure rules, transformational rules, semantic rules, and phonological rules. First, deep structure rules generate the sentence; then transformational rules gradually modify this deep structure to prepare it for semantic processing. Finally, phonological rules shape the final surface form of the sentence.

Chomsky argues that grammar must account for the generativity and creativity of language. Through transformational rules, grammar enables the production of an infinite number of different sentences. He believes that the core function of transformational rules is to convert deep structures into surface structures, ensuring the infinite productivity of language. Since, in Chomsky's view, creativity is the most essential feature of language, grammar must identify the mechanisms of this creativity and the governing rules behind it. His proposed grammatical framework, which embodies this feature, is known as "Transformational-Generative Grammar" (Bagheri, 1995, 262-263).

Functional Linguistics

Functional linguistics is a theoretical approach in linguistics that emphasizes the social and contextual roles of language instead of formal linguistics. In this approach, language is seen as a social phenomenon that has emerged to fulfill communicative needs. The language system is not arbitrary or based on convention but natural and reflective of society and human needs (Mohajer & Nabavi, 2014,

18). In this approach, the form of language depends on its function, and function plays a significant role in organizing meaning. On the other hand, language structures are formed in terms of their social function. Therefore, studying language in a social context requires examining the physical, political, social, and cultural environment in which language is used. Linguists use the term "context" to refer to such an environment (Sharifi, 2018, 75-76).

One of the most influential functional linguists is Michael Halliday. Halliday named his theory "Systemic Functional Grammar" or simply "Systemic Linguistics" (Dabir-Moghaddam, 2008, 43). In text analysis in systemic linguistics, we can distinguish two levels: "context" and "language." Language has two strata: a stratum of form or content and a stratum of expression or substance. The substance is the material of language, including phonic (audible noises) or graphic (visible marks), and the "content" expands into "lexicogrammar" and "semantics" (Halliday & Matthiessen, 2006, 5; Halliday & Matthiessen, 2014, 24; Halliday, 2005, 39).

Systemic linguistics organizes the text into four strata: contextual (situation and cultural context), semantics, lexicogrammar, phonology, and phonetics layer (Halliday & Matthiessen, 2014, 26). The contextual layer comprises cultural and situational contexts. In the cultural context, the cultural features of the environment are examined, and the situational context consists of three components:

1. The field of discourse refers to what the talk or the text is about.
2. The tenor of discourse refers to the people involved in the communication and the relationships between them.
3. Mode of discourse refers to what role is being played by language and other semiotic systems in the interaction and what form it takes, such as spoken or written, speech, monologue or dialogue, media or multimedia (Fauziati, 2016, 46; Halliday & Matthiessen, 2014, 34).

Each component of the situational context has a representation in the semantic domain. Halliday calls each of these representations a "metafunction": the ideational, interpersonal, and textual metafunction (Dabir-Moghaddam, 2007, 108).

1. The ideational metafunction is concerned with construing the experience of the world. In informal terms, it refers to the content of the message.
2. The interpersonal metafunction is about the social world, especially the speaker's and the hearer's relationship (Auziati, 2016, 46; Halliday & Matthiessen, 2006, 7).
3. Textual metafunction involves organizing ideational and interpersonal meaning as discourse" (Halliday & Matthiessen, 2006, 7-8).

The "lexicogrammar" is unique to the Functional Linguistics Framework (FLF) and refers to the interconnectedness of grammar and lexis, which are typically viewed as separate by many linguists. However, Halliday brings them together with this term (Fauziati, 2016, 47). As systemic linguistics places meaning at the center of its analyses, grammar is also considered from a semantic perspective. Accordingly, it strives to explain how language achieves meaning within the framework of lexicogrammar elements (Fig 1) (Mohajer & Nabavi, 2014, 38 qtd. in Halliday & Hasan, 1976, 5).

The lowest layer is the phonological system, which plays a fundamental role in conveying meaning. This layer includes the sound elements of

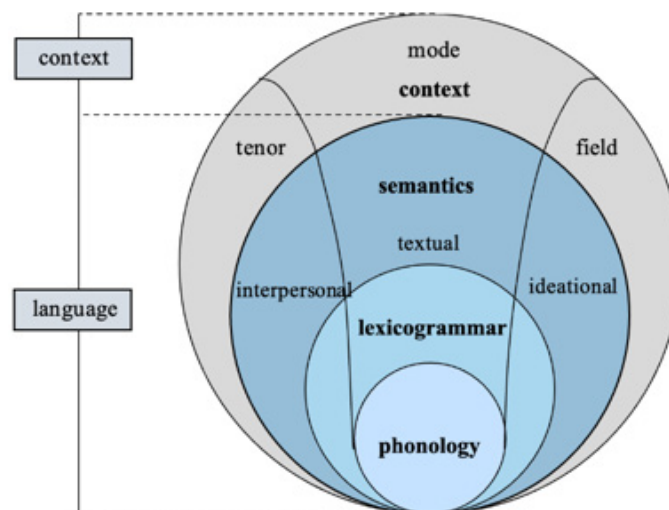


Fig. 1: Location of lexicogrammar in the division of stratification dimension (Patpong, 2009)

language, such as phonemes, morphemes, stress, intonation, pauses, and other phonetic features that influence how a message is perceived and understood.

Cognitive Linguistics

Cognitive linguistics has its roots in the emergence of new cognitive sciences in the 1960s and 1970s. The main difference between the functionalist and cognitive approaches is the shift of emphasis from the social nature of language to its psychological aspect.

Cognitive linguists examine the relationship between human language, their mind, and their social and physical experiences. One of the important bases for their study of language is based on the assumption that language reflects patterns of thought and features of the human mind. Cognitive linguistics is an approach to studying language based on our experiences of the world, our understanding, and our conceptualizing. Therefore, studying language from this perspective is a study of conceptualization patterns. By studying language, we can discover the nature and structure of human thoughts and opinions (Rasekh-Mahand, 2013, 6-7). Given the research objective and the article's limitations, only cultural linguistics is examined among the various branches of cognitive linguistics.

Cultural Linguistics

Language is a cultural activity and, at the same time, an instrument for organizing other cultural domains. Its formation is influenced by innate potentials and physical and socio-cultural experiences (Sharifian & Palmer, 2007, 1). Cultural linguistics aims to study the interrelation and interaction of culture and language in their functioning and to explore the interpretation of interactions within a unified and systematic framework. This discipline focuses on the national forms of social life reflected in the language communication system and based on its cultural values, which collectively create a language worldview

(Vorobiyov et al., 2020, 275).

Farzad Sharifian (1964–2020), an Iranian linguist and a pioneer in Cultural Linguistics, introduced a theoretical model emphasizing the cultural conceptualization of language and used the term "Cultural Linguistics" with capitalized initials to highlight its distinct definition. As a branch of cognitive linguistics, Cultural Linguistics explores the relationship between language and cultural conceptualizations, analyzing linguistic features shaped by cultural influences. Initially, cultural linguists focused on language and culture, but recent studies examine how cultural conceptualizations are embedded in language and conveyed through rhetorical devices like metaphor. Cultural Linguistics, rooted in cognitive linguistics, underscores the link between language and cognitive conceptualizations shaped by human experiences. Its analytical framework includes key concepts such as "cultural schema," "cultural category," and "cultural metaphor" to study linguistic structures at various levels—from lexicon and syntax to semantics, pragmatics, and discourse (Sharifian, 2017, 2-7).

The Application of Synchronic Linguistics in Understanding Iranian Architecture

Architecture as a Language

To understand Iranian architecture from a linguistic perspective, viewing architecture as a language is essential. Just as language is a system of interconnected elements that combine based on semantic relationships (Safavi, 2012, 50), architecture also consists of various components that come together through specific relationships to convey meaning—namely, how humans inhabit and experience space. In language, phonemes and morphemes are transformed into words through morphological rules, and words, through syntactic rules, form the structure of a sentence.

We can draw upon theorists who have analyzed architecture as a

language to align these elements in language and architecture. For instance, John Summerson, in *The Classical Language of Architecture*, and Charles Jencks, in *The Language of Post-Modern Architecture*, identify components such as doors, windows, columns, partitions, and consoles as the vocabulary of architectural language (Summerson, 1964; Jencks, 1977, 60). Rapoport compares architectural elements to phonemes and sounds, architectural forms to words, and artistic compositions to phrases and texts (Remizova, 2016, 84). Umberto Eco also analyzes architecture using the dual articulation of language. In this theory, the first articulation involves dividing speech into the smallest meaningful units (morphemes), while the second articulation breaks language down into meaningless units (phonemes) (Martinet, 1999, 13-15). Based on this, Eco considers the smallest meaningful units of architecture to be walls, roofs, and windows (which he calls "Choreme"), while he regards the smallest meaningless units of architecture as classical geometric elements such as lines, squares, rectangles, and so on (Eco, 2005, 183). However, Eco's interpretation of meaningless architectural elements as geometric forms seems somewhat abstract. Lines, squares, and rectangles do not constitute walls and roofs; rather, the building materials form these architectural elements.

Each of these correspondences can be valid and applicable depending on the scale considered in architecture. In this study, an architectural work is regarded as a sentence in language. Therefore, the smallest meaningless units of architecture are considered building materials, which, when combined, form Choreme or architectural spatial elements (such as columns, floors, roofs, walls, doors, and windows). When arranged together, the spatial elements create the architectural words or spatial units (such as the iwan, hall, dome chamber.), and these spatial units, through the spatial organization, constitute the architectural work (Fig 2). Although building materials, spatial elements, and spatial units in architecture do not directly resemble phonemes, morphemes, and words in the language, this analogy is adopted here to define architectural components and utilize them in analytical studies.

By making this analogy between architecture and language, different branches of linguistic study can be applied to understand architecture. This analogy is crucial as it enables us to compare linguistic and

architectural structures meaningfully, allowing for a comparative study of both. Therefore, a comparative study of architecture and language, aimed at discovering new approaches to the cultural study of architecture, is necessary and scientifically plausible.

RESULTS AND DISCUSSIONS

Application of Formal Linguistics in Understanding Iranian Architecture

Before delving into the application of Formal Linguistics in Iranian architecture, it is essential to explore its background in architecture in general briefly. In the 1960s, the concept of grammar entered the domains of geometry and algebra, and it proposed a method by which complex structures could be described and generated (Benrós et al., 2012, 523). In the 1960s, Edun (1961) and Narasimhan (1962) were the first to suggest the use of syntactic techniques in recognizing patterns, and Miller and Shaw (1968) also reached similar results (Stiny & Gips, 1971, 1-2). In 1971, Stiny and Gips applied shape grammar to analyze and design visual arts such as paintings and sculptures. They used this method to create shapes by applying rules to basic shapes, similar to how phrase structure grammar combines words to produce different sentences. The definition of shape grammar is similar to phrase structure grammar (Gips, 1975, 1; Stiny & Gips, 1972). Stiny noted that Shape Grammar is a useful tool for basic research to advance the science of shape (Stiny, 1976, 209).

Two types of research are conducted in the field of Shape Grammar: analytical research and research with a design and shape production approach. Architects have employed analytical shape grammar to analyze and describe historical and contemporary architecture. Researches such as, Mughul Gardens (Stiny & Mitchell, 1980), Frank Lloyd Wright's Prairie Houses (Koning & Eizenberg, 1981), "The Bungalows of Buffalo" (Downing & Flemming, 1981), Queen Anne Houses (Flemming, 1987), Casa Giuliani Frigerio (Flemming, 1981), and in the last three decades, Turkish Houses (Çağdaş, 1996), Taiwanese Traditional Houses (Chiou & Krishnamurti, 1995a), Chinese Traditional Architecture (Chiou & Krishnamurti, 1995b),

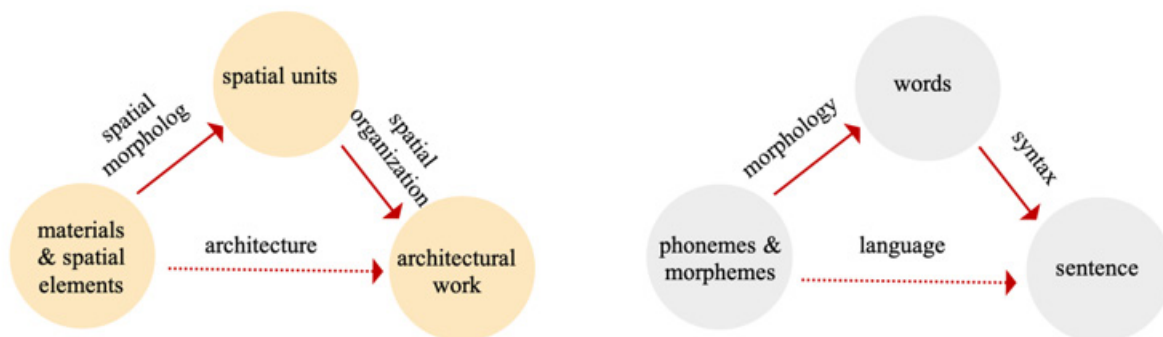


Fig. 2: Structure of language and architecture,

Wren's City Church (Buelinckx, 1993), Traditional Malay Long-Roof Type Houses (Said & Embi, 2008) are examples of the application of shape grammar for the analysis of architectural works.

This approach can be used to understand Iranian architecture as a systematic structure. Like language, architecture has specific syntactic structures that give rise to distinct spatial patterns. Iranian architecture can be analyzed within this framework as a generative system in which forms and spaces follow specific rules. In recent decades, formal analyses in architecture, including the grammar of form, have been employed to examine spatial structures. Although structuralist linguistic studies have focused less on analyzing Iranian architecture, some research, such as Klaus Herding's studies, can be a foundation for this approach.

Klaus Herdeg is one of the scholars who has used a formal approach in his analyses of Iranian architecture. In *Formal Structure in Islamic Architecture of Iran and Turkistan*, he explores the form in Iranian and Turkestani architecture, ranging from large urban spaces to small rooms. Through analyzing and comparing prominent examples of architecture, he seeks to understand and comprehend their architecture (Herdeg, 1991). Herder's approach shares similarities with the principles of structuralist linguistics, as he, like structuralist linguists, seeks to uncover the underlying structural rules in architecture.

Abulazia and Qezelbash in the *Alphabet of the Body of the Traditional House of Yazd* try to comprehend the architectural language of traditional houses. To achieve this, they initially examine the organization of Yazd houses. They focus on the typology of enclosed spaces (courtyard, three-room configuration, five-room configuration, hall, and windcatcher). They also describe the levels that constitute the rooms in terms of their morphology. Furthermore, they elucidate the linguistic syntax of traditional houses by analyzing the spatial units (Abulazia & Qezelbash, 2007).

Faramarz Parsi, in "Design Method in Historical Architecture of Iran," explains the language of Iranian architecture and states that the language of Iranian architecture consists of several words, also called spatial patterns. These words or patterns are ternary division (Seh-dari), pentamorous division (Panj-dari), binary division (do-dari), Shekam-Darideh, Chalipa, and Hashti. Then, Parsi describes Shah-Neshin, Gooshvareh, Tabestan-Neshin (summer seating area), Zemestan-Neshin (winter seating area), Howz-Khaneh (pool area), Seh-dari (three-room configuration), Panj-dari (five-room configuration), as adjectives of space. Then, he explains the construction of architectural space using patterns and adjectives. The grammar follows a hierarchical system. The value of patterns arranged around the courtyard is described in order of importance from least to greatest as follows: "Taqsim-e Do-ta'i" (binary division), "Taqsim-e Se-Ta'i" (ternary division), "Taqsim-e Panj-Ta'i" (pentamorous division), "Shekam-Darideh" (Ripped belly), and "Chalipa." The main axis of the courtyard represents the highest hierarchical level, while the secondary axis utilizes spaces with equal or lower hierarchical levels (Parsi, 2012, 13-18).

In the past decade, several studies have been conducted using the approach of shape grammar in Iranian architecture; however, many, such as "A Specification of a New Pattern of Shape Grammar in Architecture of Today's houses Case study: Qajar houses in Tabriz and

Tehran (Hasani & Nourouz Borazjani, 2018) and "Re-read of Court's Form and Related Spaces with Shape Grammar Case Study: 100 Houses of Qajar Dynasty in Kashan City (Hasani et al., 2016), have attempted to use the shape grammar to develop a model applicable to the design of contemporary houses.

Only two studies, "Investigation of the formal structure and spatial relations of 19 historical houses of Kashan" (Hosseini & Bemanian, 2022, 8) and "Decoding Architectural Elements Using the Grammar of Form (Typology of Spaces in 64 Historical Houses from Kashan, Yazd, and Isfahan)" (Hosseini et al., 2025), have attempted to explore and categorize typologies houses through the shape grammar. The research applied structuralist linguistics to analyze Iranian architecture, which is limited and mostly focused on cities like Kashan, Isfahan, and Yazd. Furthermore, most of these studies have concentrated on formal analyses aimed at generating new forms, with less emphasis on understanding and examining the structural characteristics of Iranian architecture.

The main goal of Formal Linguistics is to describe universal grammar. Another goal is to model language by employing precise grammar and mechanical tools to generate all possible grammatical sentences in a language. Four rules can be considered for analyzing Iranian architecture from the perspective of Formal Linguistics: deep structure rules, transformational rules, semantic rules, and phonological rules.

Deep Structure Rules: Just as in language, deep structure refers to the underlying structure that shapes the meaning of a sentence and exists in the mind before the sentence transforms into its surface structure; in architecture, fundamental principles can be considered that shape architecture. These principles are similar to the mental concepts in our minds, which have not yet been transformed into language.

Transformational Rules: In language, transformational rules modify the deep structure of a sentence step by step to convert it into comprehensible sentences. These rules involve processes that transform the deep structure into the surface structure. In architecture, transformational rules can refer to the transformations and changes in forms and spaces. Specifically, in architecture, these rules may represent how the evolution and gradual changes in the design of spaces and architectural forms occur, from the initial stages to the final, experienceable form.

Semantic Rules: In language, semantic rules determine whether a sentence is meaningful and semantically correct. In architecture, meaning is created through the organization of spaces. In other words, space can convey a specific meaning and message by combining spatial and geometric principles.

Phonological Rules: In language, phonological rules determine how sounds are systematically and harmoniously arranged to pronounce words correctly. This can be compared to the rhythm, melody, and geometric order of spaces in architecture.

Ultimately, the creativity of language refers to the ability to generate an infinite number of sentences using a limited set of words and rules. This concept also applies to Iranian architecture, as an infinite variety of different spaces and combinations have been created throughout the history of architecture using limited "words of architecture." In other words, just as language creativity enables the creation of new sentences

Table 2: Functions and systems in architecture (O'Toole, 1994, 86)

Units/ Functions	Experiential	Interpersonal	Texture
Building	;Practical function: Public/Private Industrial/Commercial/Agricultural/ Gov- ernmental/Educational/Medical/ Cultural/ Religious/Residential; Domestic/ Utility Orientation to light Orientation to wind Orientation to Earth Orientation to service (water/sewage/power)	Size bors Verticality Facade entrant Cladding Color Modernity Exoticism	Orientation to neigh- bors Orientation to road Orientation to Intertextuality: reference mimicry contrast Relation to city Relation to road Relation to adjacent buildings Proportions Rhythms: contrasting shapes, angles Textures: rough/smooth Roof/ wall relation Reflectivity Opacity
Floor	Sub-functions: Access Working Selling Administration Storing Waking Sleeping Parking	Height Spaciousness Accessibility Openness of vista View Hard/soft texture Color	Relation to other floors Relation to the outer world Relation to connectors; stairs/lift escalator (external cohesion) Relation of landing/corridor/ foyer/ room (internal cohesion) Degree of partition Permanence of partition
Room	Specific functions: Access Study Foyer Entry Toilet Restaurant Living room, Laundry Kitchen Family room Games room Bar Kitchen Retreat Bedroom Bathroom Ensuite Bedroom Served	Comfort Lighting Modernity Sound Opulence Welcome Style: rustic, pioneer, colonial, suburban, 'Dallas,' working class, tenement, slum Foregrounding of function	Scale Lighting Sound Relation to outside Relation to other rooms Connectors: doors/windows/ hatches/intercom Focus (e.g., hearth, dais, altar, desk)
Element	Light: window, lamp, curtains, blinds Air: window, fan, conditioner. Heating: Central, fire, stove Sound: carpet, rugs, partitions acoustic, treatment Seating {Function {comfort table {dining {coffee {occasional {desk {computer {drawing	Relevance Functionality: convention/surprise Texture: rough/smooth Newness Decorativeness 'Stance' Stylistic coherence Projection (e.g., TV)	Texture Positioning: to light/heat/other elements Finish

indefinitely, in Iranian architecture, this "structural creativity" has produced diverse spaces from the combination of fundamental architectural principles.

Formal Linguistics is an analytical method for describing the shape and composition of architectural forms. One of the main advantages of using grammar in studying Iranian architecture is that it enables systematic analysis and combines complex architectural forms. With this method, it is possible to identify the rules and grammatical structure of architecture by analyzing Iranian architectural works and understanding the changes and evolution of the architectural structure of Iran, as well as the structural differences in Iranian architecture across different geographical regions. Understanding structural forms undoubtedly illuminates aspects of architecture that are not easily visible, allowing researchers to gain a deeper understanding of the foundational principles of this architectural tradition.

Application of Functional Linguistics in Understanding Iranian Architecture

Since the 90s, Halliday's functional-systemic grammar has been used in art studies. Social semioticians such as Gunther Kress and Theo van Leeuwen in *Reading Images: The Grammar of Visual Design* have based their framework on this theory. They introduced the concept of "visual grammar" as a method for understanding how meaning is constructed in visual texts, including advertisements, photographs, and illustrations. This approach, similar to the concept of "metafunction" in Michael Halliday's theory, suggests that visual grammar has three components: representation, interaction, and composition. The representation mode is concerned with how visual elements represent the world, the interaction mode is concerned with how visual elements interact with the viewer, and the composition mode is concerned with how visual elements are organized to create meaning (Kress & Leeuwen, 2021).

Michael O'Toole, a communications professor in Australia in 1994, used a systemic-functional approach to analyzing visual arts such as painting, sculpture, and architecture. He compared architecture with visual arts using a systemic-functional approach and argued that architecture, due to its practical function, had more similarities to language than visual arts (O'Toole, 1994, 85). O'Toole identified only three experiential, interpersonal, and textual functions for architecture and examined them in four units: building, floor, room, and elements of a room (Table 2) (O'Toole, 1994, 86).

O'Toole has chosen three buildings for analysis using this method in *The Language of Displayed Art*. These buildings have been constructed in very different times, places, and conditions and have completely different goals. These three buildings include a contemporary building in Australia, an office block designed by Alvar Aalto in Helsinki, and the Ronchamp Le Corbusier Church (O'Toole, 1994, 87). He also, in "Opera Ludentes: The Sydney Opera House at Work and Play," analyzed the Sydney Opera House using the same method in terms of experiential, interpersonal, and textual functions (O'Toole, 2004).

O'Toole has only focused on analyzing the semantics layer in architecture, but by examining all the layers mentioned, a comprehensive interpretation of an architectural work can be obtained.

Halliday's approach has been widely used in Iran for analyzing literary texts, poetry, and Quranic verses, but it has not been used to analyze architectural works.

The systemic-functional Halliday approach can be used to interpret the architectural work as a text. In this approach, emphasis is placed on the social roles of architecture, and architecture is examined as a social phenomenon shaped according to the needs of society and humans. In the following, an attempt will be made to examine how Halliday's functional grammar can be applied to analyze an architectural work as a text from a comparative approach. This approach emphasizes the relationship between form, meaning, and function, and architecture is interpreted through the relationships between its components and functions within a cultural-social context.

Two levels can be considered for interpreting architecture from this perspective: the context and the architectural work. In this approach, the architectural system can be divided into two layers: expression or substance and form or content. Since the subject of architecture is human life, and what it expresses is the way of human dwelling, the layer of substance or expression—which in the language corresponds to the phonological system (phonemes and morphemes)—in architecture is the spatial system that refers to the combination of material and the spatial elements. The form layer includes spatial order units and the semantics layer (Fig 3).

So, in this approach, four layers can be considered for interpreting architecture: contextual, semantic, spatial order units, and spatial system (Fig 4). In the cultural context, the cultural features of the environment in which architecture is situated are examined. In situational context, The context of the situation consists of three components:

1. Field of architectural discourse: It refers to the domain to which architectural work belongs, such as educational, residential, or cultural.
2. The tenor of architectural discourse refers to elements present in the discourse of architecture.
3. Mode of architectural discourse: It refers to the form that architecture takes in interaction with other semiotic systems, such as vernacular, rural, and government architecture.

Each component of the context of the situation has a specific representation in the domain of meaning: ideational metafunction, interpersonal metafunction, and textual metafunction.

1. Ideational metafunction (experiential): It is the same as the practical functions of the building. Public/ Private; Industrial/ Commercial/ Agricultural/ Governmental/ Educational/ Medical/ Cultural/ Religious/ Residential. As the chart of functions and systems in architecture shows, a large number of experiential functions are involved in a building complex, such as orientations to light, to wind, to the Earth, and the provision of services such as water, sewage, power, scenery and food delivery, car-parking, waste disposal. (O'Toole, 2004, 17).

2. Interpersonal metafunction: The relationship between the building and its surroundings is examined, such as a building's orientation to its neighbors and the road, orientation to the entrant, height, facade, and color.

3. Textual metafunction: How different architectural elements are integrated to form a cohesive and significant entity. Similar to language, the ability of these architectural components to combine and

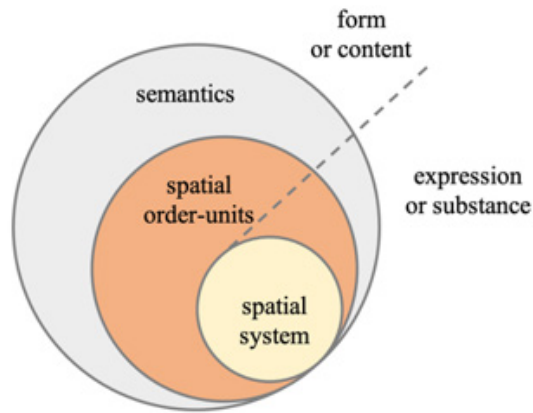


Fig. 3: Architecture as a tri-stratal system

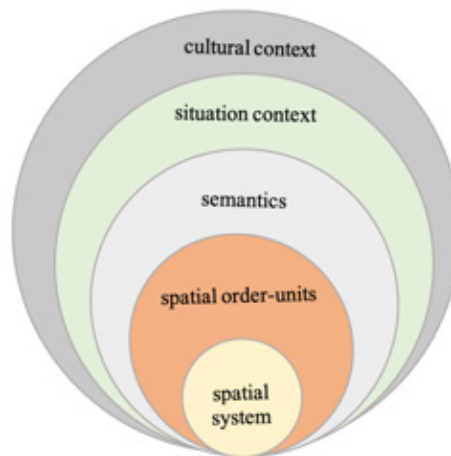


Fig 4: Stratification in architecture

refer to each other and their surroundings, as well as their placement in rooms, floors, and buildings, establishes their collocational potential and transforms them into coherent and usable "texts" (O'Toole, 2004, 11). This function examines the relation to city, road, and adjacent buildings, rhythms, contrasting shapes, angles, textures, rough/smooth, roof/ wall relation, reflectivity, and opacity.

The next layer is the spatial order units. In this layer, the spatial units of architecture and spatial organization are placed in one layer, explaining the relationship and coherence between spatial units and spatial organization. Since this approach focuses on meaning, spatial organization is also examined from a semantic perspective. In contrast to the formal approach, where the architectural grammar (spatial organization) was analyzed based on a formal and visual system, this approach investigates how the realization of architectural meaning is

achieved in the spatial units and spatial organization. This approach can demonstrate how spatial units of architecture and spatial organizations in different areas correspond to the characteristics of cultural and situational contexts.

The lowest layer is the spatial system. This layer corresponds to phonology or phonetics in language. This layer can be explained in architecture as the spatial structure, where spatial elements –walls, floors, ceilings, doors, and windows– materials and spatial proportions are examined. As in language, morphemes are the smallest units of meaning differentiation; in architecture, the spatial elements –such as walls, ceilings, floors, openings, and their arrangement– play a fundamental role in shaping the spatial system. This layer examines how space's material and sensory characteristics influence individuals' perception and experience of space, providing the foundation for the

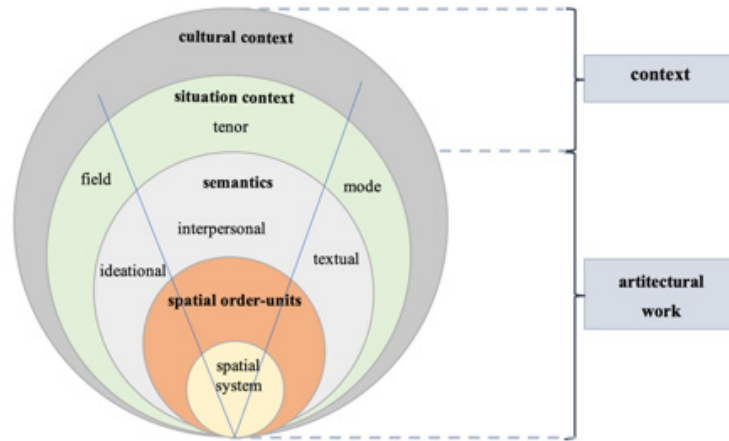


Fig 5: Application of systemic-functional Halliday approach in architecture

emergence of higher levels of meaning in architecture (Fig 5).

Using Halliday's approach to interpret Iranian architecture helps achieve more precision of the architecture and its role in social and cultural interactions. This approach allows us to understand what metafunctions are not present in architecture and which types of studies have been less explored. In many Iranian architecture studies, architecture is often studied independently of its social and cultural context, and the impact of the social and cultural context on architectural form is less explored. Additionally, the way meaning is realized in architecture through spatial units and spatial organization has received less attention. Another less-explored study is understanding spatial systems, such as what features make a space Iranian. These analyses provide capabilities to discuss aspects of architecture as a linguistic-cultural matter that has received less attention in architectural studies.

Application of Cognitive Linguistics in Understanding Iranian Architecture

Cultural Linguistics

The relationship between architecture and culture has been the subject of many studies. Amos Rapoport is a famous architecture and urban design scholar in this field. He argues in *House, Form, and Culture* that the shape of a house is not solely the result of physical forces or any other single causal factor but rather the result of a complex set of social-cultural factors (Rapoport, 1969). He has investigated the relationship between culture, built environment, and design in *Culture, Architecture, and Design*. Here, Rapoport tries to analyze the relationship between culture and the built environment by presenting a model (Rapoport, 2005). In *The Mutual Interaction of People and Their Built Environment: A Cross-Cultural Perspective*, he provides useful methodological structures for the study of the built environment

concerning people (Rapoport, 1976), and in "The Nature of the Courtyard House: A Conceptual Analysis," he examines courtyard houses from a behavioral-environmental perspective (Rapoport, 2007). He also discusses the relationship between the house and culture in his article "Theory, Culture, and the House," where he argues that the concept of culture is overly abstract and general and proposes a method for simplifying the relationship between culture and the built environment (Rapoport, 2001).

Low and Chambers have examined the interaction of culture and the built environment in *Housing, Culture, and Design: A Comparative Perspective* (Low & Chambers, 1989). In *Shelter, Sign, and Symbol*, Paul Oliver investigated how people's beliefs and values are reflected in vernacular architectural form (Oliver, 1975). *Built to Meet Needs: Cultural Issues in Vernacular Architecture* has also demonstrated the cultural and social criteria that influenced the growth of indigenous architectural forms. This book highlights the extensive range of architectural forms found in vernacular architecture, which can be attributed to diverse factors such as environmental conditions, economic considerations, technological advancements, cultural traditions, social structures, symbolic systems, and beliefs prevalent in different societies. The author underscores that this diversity reflects each culture's unique demands and values.

The book comprises a compilation of articles, conferences, and studies conducted by Oliver since the 1980s, categorized thematically for easier organization and reference. (Oliver, 2006). Henry Glassie in *Vernacular Architecture (Material Culture)* (Glassie, 2000) and Carter and Cromley in *Invitation to Vernacular Architecture: A Guide to the Study of Ordinary Buildings and Landscapes* (Carter & Cromley, 2005) state key principles for the study and analysis of vernacular architecture, and are a valuable guide for cultural studies of vernacular architecture. *Invitation to Vernacular: A Guide to the Study of Ordinary Buildings*

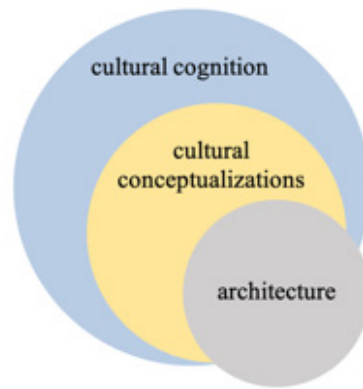


Fig 6: The theoretical framework of Cultural Linguistics and architecture

and Landscapes is a manual for exploring and interpreting vernacular architecture, which is the common buildings of particular regions and periods. The authors walk readers through examining and documenting a building and explain what to look for at each level. They show how to find patterns and organize information to yield sound interpretations of buildings' meanings. They show how analysis of facts related to a building can reveal important insights into the behavior and culture of people who lived in a certain area at a certain time.

In Iran, scholars have investigated the relationship between culture and architecture. Mahdi Hodjat and Seyyed Mohammad Beheshti are among the most important scholars who studied Iranian architecture from a cultural perspective. Seyed Mohammad Beheshti, in *Where is Iran, who is Iranian?* in the first perspective, which is the cultural perspective, focuses on understanding the characteristics of the cultural

domain of Iran (Beheshti et al., 2023). Mohammadreza Haeri, in *House in Culture & Nature of Iran: A Study of Architecture of Historical and Contemporary Houses to Compile the Process of House Design*, examines the lifestyle and spatial organization of Iranian houses and their transformations in the contemporary period (Ha'eri, 2016), and Qolamhossein Me'marian and Frank Edward Brown in *"Climate, Culture, and Religion: Aspects of the Traditional Courtyard House in Iran"* investigate the impact of climate and religious ideology (Shi'a Islam) on the spatial and formal organization of the house (Me'marian & Edward Brown, 2003).

As explained in cultural linguistics, the cultural linguistics approach in recent decades focuses on understanding the relationship between language and cultural conceptualizations (Fig 6). The manifestation of cultural conceptualizations can be seen in many architectural

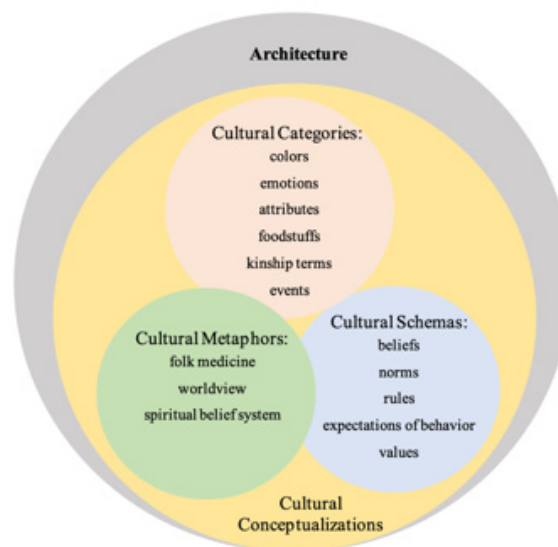


Fig 7: Cultural conceptualizations and architecture

features. The analytical framework of "Cultural Linguistics" provides a useful tool to examine architecture's characteristics and analyze the relationship between architecture and cultural conceptualizations. This tool includes "cultural schemas," "cultural categories," and "cultural metaphors."

"Cultural schemas" refer to the collective beliefs, norms, rules, expectations of behavior, and values associated with various aspects of human experience. On the other hand, "cultural categories" and subcategories are culturally constructed conceptual categories, including things like colors, emotions, attributes, foodstuffs, kinship terms, and events, primarily reflected in human languages' lexicon. Finally, "cultural metaphors" are conceptualizations that draw on cultural traditions such as folk medicine, worldview, or spiritual belief systems and create connections between different domains of experience (Fig 7) (Sharifian, 2017, 7).

One of the studies that can be conducted with a Cultural Linguistics approach is examining the relationship between cultural conceptualizations and architecture. What is the relationship between cultural schemas, including beliefs, norms, rules, expectations of behavior, and values related to various aspects of experience with architecture? What is the relationship between cultural categories, including conceptual categories such as colors, emotions, attributes, foodstuffs, kinship terms, events, and architecture? And what is the relationship between cultural metaphors such as worldview or spiritual belief systems and architecture?

Despite the richness and potential of this area of inquiry, the number of studies examining the relationship between cultural conceptualizations and architecture remains limited. Among the few available examples, Shakouri and Khodadadi, in "Scrutinizing the Nomadic Schema of Residence Case study: Qashqai Nomads of Semirom," try to investigate the important elements of the life and residence of Qashqai nomads to build nomadic housing, by understanding the residence scheme of nomads (Shakouri & Khodadadi, 2014). Similarly, Gharehbaghlou and Ashtiani, in "The Role of Mental Schemes in the Formation of Traditional Maragheh Housing Pattern," examined the impact of mental schemas on the formation of traditional houses in Maragheh (Gharehbaghlou & Ashtiani, 2022).

CONCLUSION

This article deepens the understanding of Iranian architecture through a synchronic linguistic approach, focusing on hidden meanings and spatial structures rather than just superficial and descriptive aspects. It highlights the importance of theoretical and conceptual analysis, demonstrating how linguistic methods can be a powerful tool for understanding Iranian architecture's underlying concepts and principles. The significance of theory lies in its ability to help us grasp the apparent structures and the underlying semantic and social infrastructures of architecture.

This study has explored the potential of applying synchronic linguistics to understanding Iranian architecture, offering a fresh perspective on a field traditionally dominated by descriptive analysis. By examining

architecture as a structured system akin to language, this research has highlighted the significant parallels between linguistic structures and architectural forms (Fig 8).

We have drawn parallels between the components of architecture and language, allowing us to apply linguistic methods in architectural analysis. Just as language consists of phonemes, morphemes, words, and syntax that convey meaning, architectural elements such as materials, spatial elements, spatial units, and their organization can be analyzed similarly, providing new insights into architecture's structure and cultural significance.

Formal linguistics can be applied in architecture through four key linguistic rules. Deep structure rules refer to the fundamental principles that shape architectural meaning. Transformational rules explore the evolution and transformation of architectural forms and spaces. Semantic rules focus on how the organization of spaces conveys meaning through spatial and geometric relationships. Phonological rules relate to the rhythm and harmony of spaces, akin to the arrangement of sounds in language. Additionally, the creativity of language, which allows for the generation of infinite new sentences, can be applied to architecture, reflecting the endless possibilities in designing unique architectural forms using fundamental principles. This approach reveals hidden structural aspects of Iranian architecture.

The application of Halliday's systemic-functional linguistics to Iranian architecture allows for interpreting architecture as a text, focusing on the social roles of architecture within its cultural context. This approach examines the relationship between form, meaning, and function, analyzing architectural components through four layers: contextual, semantic, spatial order units, and spatial structure. Context includes cultural and situational aspects, while the semantic layer explores the meaning of architectural spaces. The spatial order-units layer connects spatial units and their organization, and the spatial structure layer, akin to phonology in language, examines the fundamental elements such as walls and openings. This approach highlights the cultural and social interactions within architectural design and uncovers aspects of Iranian architecture that are often overlooked, such as the realization of meaning through spatial organization and the role of social context in shaping architectural forms.

Cultural linguistics explores the relationship between language and cultural conceptualizations, and this approach can also be applied to architecture. One can uncover the deep connection between cultural values and architectural features by analyzing cultural schemas, categories, and metaphors. Cultural schemas represent collective beliefs, norms, and values that influence architectural design. Cultural categories, such as colors, emotions, and events, reflect how societies conceptualize different elements, which can be seen in architectural choices like decoration or spatial organization. Cultural metaphors, rooted in worldviews and spiritual beliefs, shape architectural expressions that reflect cultural meanings. This approach helps to interpret how cultural conceptualizations manifest in architectural forms, linking social norms, language, and space in a deeper cultural context.

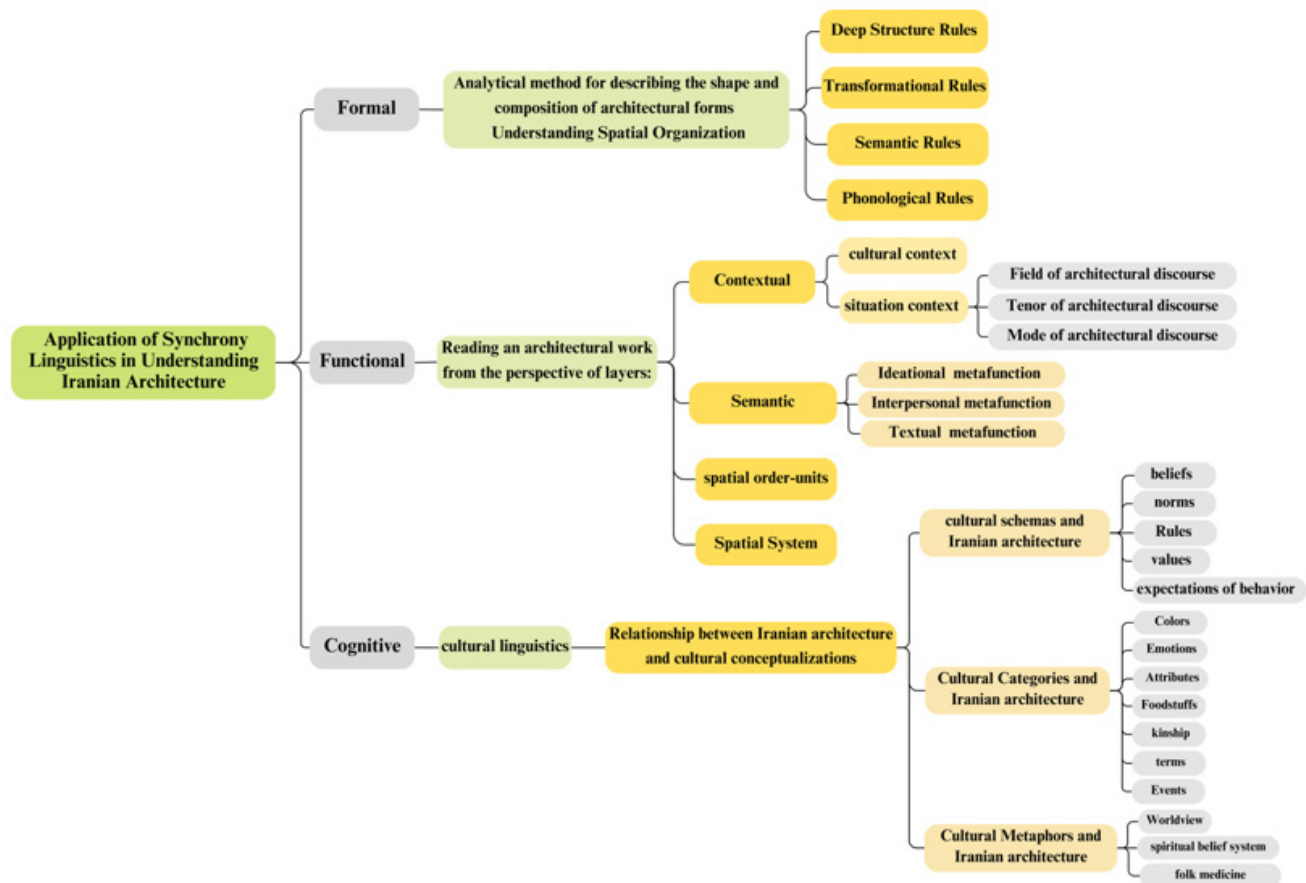


Fig 8: Application of synchronic linguistics to understanding Iranian architecture

These methods reveal the underlying principles that shape architectural forms, helping to decode how architecture communicates meaning, reflects cultural values, and responds to social contexts. By examining architecture through these lenses, researchers can gain deeper insights into the cultural and functional dynamics that influence architectural practices.

ENDNOTES

1. see: Golijani Moqaddam, 2007, 15, Qayyoomi Bidhendi, 2005, 4, and Qayyoomi Bidhendi, 2007, 5.
2. Approaches such as Gestalt psychology, phenomenology, social linguistics, discourse analysis, and psycholinguistic linguistics, which are branches of cognitive linguistics, can be explored in further research.
3. "The grammar of paradise on the generation of mughul gardens"
4. "The language of the prairie: Frank Lloyd Wright's prairie houses"
5. "More than the sum of parts: the grammar of Queen Anne houses"
6. "The secret of the Casa Giuliani Frigerio"
7. "A Shape Grammar: The Language of Traditional Turkish Houses"
8. "The grammar of Taiwanese traditional vernacular dwellings"
9. "The grammatical basis of Chinese traditional architecture"
10. "Wren's language of City church designs: a formal generative classification"
11. "A Parametric Shape Grammar of the Traditional Malay Long-Roof Type Houses"

AUTHOR CONTRIBUTIONS

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CONFLICT OF INTEREST

The authors have expressed no conflict of interest.

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