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Original Research Article

An Evaluation of Persian-Speaking Researchers' Description and Interpretations of the Spatial Organization of Cities

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Abstract

Problem statement: In recent decades, the growth of urban science has turned the interpretation of the city into a challenging issue for researchers. The emergence of the spatial organization of cities has been the result of extensive studies carried out by researchers for the interpretation of cities. Despite a lot of attempts for identifying the organizational components of the city and their relations, there is no consensus among researchers and experts on the definition of the spatial organization of cities in urban sciences and this term is still vague. The multiple definitions with different expressions, words and attributes have generated multiple meanings in the Iranian urban planning literature. Such multiplicity makes it impossible for experts and scholars to discuss a single subject and reach a precise conclusion.

Research objective: For this purpose, this research seeks to criticize the meanings and structure of the definitions, to present the pathology associated with the definitions and to identify their existing shortcomings. In so doing, this study serves as a springboard for future research on semantic expansion.

Research method: Data for this study were analyzed and categorized in terms of semantic and structure through content analysis.

Conclusion: The findings of this study indicate the multiplicity of this concept in terms of meanings and show the plurality of appellations, attributes. It also shows the definitions do not follow the maxims of logic and there is an internal contradiction in the definitions. Examination of the definitions also reveals that sometimes this term is interchangeably used with other different terms such as urban structure in urban literature. Besides, the analysis of the structures of the proposed definitions indicates that they are too incomprehensive to include all the attributes of the concept and they are too exclusive to differentiate it from similar concepts. This indicates the semantic ambiguity of this concept in the minds of Persian-speaking scholars.

Keywords: *Spatial Organization of Cities, Urban Structure, Urban System, City.*

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Introduction

In the last century, the distinction between the external structure of the city and the perception of its citizens has been one of the major advances in urban planning. The emergence of new attitudes toward the city has encouraged experts to place importance on the interpretation of the city. The scientific term of the spatial organization of cities has been the result of the reflection of scholars on the interpretation of urban order. This term deals with the order that has been imposed on the components of the city and explains how the mind perceives it by making a connection between the separated elements of the city in a meaningful order. Even though this concept shapes in the mind of the audience, it is realistic and changes many aspects of a city - such as locating, functions, development, etc. and the lives of citizens. Besides, the mentality of the citizens about the way it is organized, valued and received its meaning also affects its developments. However, several conceptual challenges have been raised since this concept found its way to the Iranian literature through the translation of Western texts by scholars in recent years. Analyzing definitions presented shows that this concept has been used to refer to different meanings and despite the similarities among all definitions, there are ambiguities and available definitions contradict one another. This research identified 9 different translations for this concept. This plurality of meanings shows the semantic ambiguity of this term in the urban planning literature. Though this term is one of the basic concepts in the interpretation of the city, it has been under-researched. The scarcity of research in this area may deprive scholars of discussing this issue on a logical basis and result in an accurate interpretation of urban issues. Therefore, this study first attempts to present the views of experts and explain the theoretical foundations of the issue and then seeks to analyze and identify the existing deficiencies of the existing definitions. In the first phase of this study, all definitions were analyzed in terms of semantic. To this purpose, the selection of different terms or appellations for the same concept was scrutinized both in writing and translation. In this section, terms were critically examined in terms of semantic coherence and then adjectives used to express the concept were compared and categorized. In the second phase of the study, definitions were examined in terms of forms and their logical structures were examined with the reference to their context. In this first section, the main criteria for assessing definitions were developed based on the science of logic and then all definitions were analyzed accordingly. Finally, the shortcomings of existing definitions were examined in terms of structures and recommendations for re-examining the definition of this concept were provided.

Research questions

What terms have Iranian researchers, authors and translators used for the interpretation of the concept of the spatial organization of cities?

Can certain criteria and indicators be developed for evaluating this concept based on this interpretation?

Do these interpretations have scientific validity?

Research hypothesis

The absence of standard criteria and indicators in literature for describing the spatial organization of cities in Persian texts do not result in a common understanding of this concept.

Literature review

The first endeavors to interpret the city's order began before the 1960s, these issues received more attention when Crane (1960) published his article "The City Symbolic". He used "urban structure" to explain the same concepts and referred to "streets, public buildings and open spaces and their amenities". The concepts had been first used in 1924 by "Burges" in "Sociological Discussions". Similarly, Bacon (1978) used the same term in his book called the "Design of Cities" to show the differences between the "necessary and unnecessary" part of the city. Also, in this book, "What City?"

Buchanan (1988) referred to the need for space in the public domain and used it to describe the "structure of urban shape and the mental image of the people". Some scholars used this concept in the same sense and emphasized structure, in the 1960s and 1970s there was a tendency for adopting a systemic perspective. Thinkers such as "Tange", "Lüchinger" and "Alexander" were among the promoters of this perspective. Tange (1966) referred to the performance, structure and symbol of the city as a growing organ that makes a network of "energies and communications" and this was later interpreted as the "Spatial organization of cities" Lüchinger (1981) also used the concept in his book "Structuralism in Urban Architecture and Planning" to describe the "main and regulating part of urban life".

In Iran, the term "urban system" was first used by Farshad (1989) for a systemic approach to the city, the concept was extensively used in Iran in the 1960s. In his article "Space organizations in the architecture of traditional Iranian cities", Ghaffari Sedeh (1994) highlighted the importance of a systemic approach to the city. However, in his article, he did not define the urban system. Tavassoli (1995) also referred to this concept in the article "Architectural space and Iranian city against the West" using the term "physical urban organization". He presented the examples of this concept "city center, neighborhood centers, connecting elements and ..." but he did not provide a clear definition. In his book entitled "Urban space design", Madanipour (2000) referred to the social and spatial process of the spatial organization of cities as a phenomenon with "two physical and metaphysical dimensions", but he did not use any adjectives to describe what it is. Similarly, Nourmohammadzadeh (2004) also referred to the systemic concepts of the city in the article "Urban problem: A systematic approach", but there were not any equivalent for this approach in the concepts of the space organization. Besides, Bahraini, Bolooki & Taghabon (2009) in their book, "Contemporary Urban Design" presented these concepts using three different terms: "superstructure", "mega-form" and "the main urban structure", each of which indicates a variety of meanings . Zekavat (2013) also referred to the importance of the physical organization in urban design. According to him, "physical order and different structure of mass and space, compared to the general grain size of the city". Most of the texts have presented the physical aspects of this concept. Also, Ahari (2016) in an article entitled "The concept of structure and methods of its recognition in pre-modern Iranian cities" criticized the existing definitions but was not able to evaluate the structure and content separately.

Materials and method

• Selection of sources

Data for this study were gathered from articles, books and written interviews published in scientific journals and scientific websites. Since the "spatial organization of cities" has entered the urban literature of Iran through the translation of English texts, there are different translations for this concept. Therefore, in this study, titles, abstracts, keywords and literature on more than 150 written sources were searched using keywords as spatial organization of cities, urban spatial organization, urban system, urban structure, the main urban structure, the spatial structure, etc. The databases included journals, books and scientific sites. Among the collected sources, some were omitted because they used this concept in a different sense than the one in this study. Of 73 selected articles, finally, 32 sources, including 11 books, 20 articles and 1 written interview in both Persian and English were reviewed and 24 researchers who specifically defined this concept and provided its interpretation were selected and analyzed. Therefore, in this study, experts who used the concept but their aim was not to provide its explanation and just indirectly referred to this concept were excluded from the databases.

• Data analysis method and research design

Content analysis was selected for data analysis since the analysis included the reflection on the

bibliographical data pertinent to the opinion of experts and the categorization of data. In this research method, the scientific data and the way of categorizing them are described and then they are finally analyzed. In this method of data analysis, the research topic is the unit of analysis and research. For this reason, to interpret the data in some sections, this concept was examined in original English texts to which some authors had referred to. Data were collected and then analyzed from semantic and structural perspectives based on the logic of definition. The meaning aspects deal with the appellation, semantic coherence and attributes of definitions. The structure of the definition is related to two principles of definition, namely, the comprehensiveness and the exclusion of the subject. Finally, after reviewing analyses and discussions, the conclusion was made and the research questions were answered.

Theoretical framework

The spatial organization of cities is one of the most controversial issues among researchers. Researchers have used many terms and names, definitions and descriptions for this concept. Bahraini et al. referred to this concept as the "main urban structure" and states "In fact, it is the mega-form, superstructure, or the main urban structure formed based on shapes, activities and urban spaces that have been featured for structural, spatial or functional characteristics. In other words, the main urban structure is the main part of the city where the main functions of the city are located and the general ideas about the city and the orientation of its future development are determined for instance the main communication axes, major open spaces and public buildings. In addition to focusing on economic, political, governmental, cultural, religious and leisure activities, this core structure also focuses on social relations. This section describes the main features of the city and promotes its sustainability, identity and stability" (Bahraini et al., 2009, 153). Daneshpour and Rousta stated that "While in every city there are elements that change over time; they are some components that remain constant in the long run and play an important role in determining the urban shapes" (Daneshpour & Rousta, 2012, 46). "The main urban structure is the source of the system governing the phenomenon of the city, which, as a meta-system shapes and organizes its main subsystems, components and main elements. The city, a physical structure with a distinct and growing body, must have this main structure which forms a strong, stable, continuous, firm and sustainable body of the city and creates its shape, size, functions and main identity" (ibid. 52).

Nourmohammadzadeh also described the "urban structure" through the lens of a systemic approach: "The arrangement of the elements or organization of the components of the system are in line with the system's purpose and requires establishing a relationship between the elements and components within itself and this relationship is called structure The relationship between the components and elements constitutes the urban system and their interaction (activity and function) defines the urban system. Such a structure generally creates order and linkages between phenomena and gives them meaning. The structure of a system can have horizontal (transverse) and vertical (deep) components. In other words, a system can have levels or classes. The vertical (deep) components of a system represent a hierarchical system with systemic levels. Horizontal (transverse) components indicate the classes that accommodate activities (functions) concerning resources" (Nourmohammadzadeh, 2004, 50-51). Soheylipour, Ghaffari and Shafiei used the same term but addressed the issue from another perspective. According to them, "urban structure presents images of the city that include identity and functional element on an urban scale and refers to their relationships. In other words, it is the result of interactions between economical, natural aspects, infrastructure, rules and taxes, which have shaped over the years. The structure expands over time and its integrity and unity help the whole system grow. In other words, the structure deals with urban

components and their relationship and this means that a city as an entity is developed based on its own rules. It is worth mentioning that the spatial urban system is directly associated with urban life and its activities. Therefore, this issue plays an important role in shaping the physical aspect, economic and social affairs of urban life. The urban spatial structure focuses on the spatial arrangement of places and activities. The spatial structure of the city is a general or brief description of the distribution of phenomena in the urban geographical space that is used to analyze land use patterns" (Soheylipour, Ghaffari & Shafiei, 2012, 68-69). Zekavat also made a different statement: "The urban structural pattern refers to the continuity and emphasis contributing to the physical shape of the urban spaces and it has a different physical order and structure in terms of the mass and space compared to the general granularity of the urban infrastructure. The process of forming such an arrangement through an intervention in the primary organs of the urban fabric is relatively short and integrated. The urban structure patterns related to the neoclassical period generally contain conceptual designs. He added that structural interventions generally occur in urban centers and they must be interconnected and be structurally cohesive (Zekavat, 2013, 79). Similarly, Molaei and Aysham stated that "the urban structure can be considered as a tool for identifying the city and the system governing the phenomenon of the city" (Molaei & Aysham, 2018, 121). Using a similar expression, Labibzadeh and Hamzehnezhad stated that "It seems that the structures of cities influenced by geometric and free systems have significant and symbolic values" (Labibzadeh & Hamzehnezhad, 2018, 43). Some researchers used similar but different definitions for urban structure. "The two main elements of the urban spatial structure are the square and the street". These two are the primary elements of the urban spatial structure" (Tavassoli, 2007, 43). Babaei-Morad, Mohammadi and Asgari also stated that "The urban spatial structure with the network of passages and functions, is the main organization of the city" (Babaei-Morad, Mohammadi & Asgari, 2016, 6). Montazeri, Jahanshahloo and Majedi also stated that "the structure of the city is the result of historical processes and dynamic socio-economic and political conditions" (Montazeri, Jahanshahloo & Majedi, 2017, 40). However, Hamidi, Habibi and Salimi used an "urban skeleton" which is a completely different term but has similar definitions: "The physical structure of the city is the main skeleton, in other words, the organization of its main components that have been shaped based on different patterns. These different patterns are geometric and regular but they have irregular organ-like shapes and ... The main urban skeletons often have compound forms during growth. The shapes of different patterns are influenced by natural and artificial factors in the urban areas and their adjacent environments as well as various urban uses, cultural, social and economic characteristics. One of the important and necessary characteristics of the main skeleton of a city is its ability to grow change, rebuild and reorganize the city and its main skeleton is based on the realities, needs of each period of life as well as the activities of urban society. With the help of organizational patterns, urban physical elements and structures are developed. Each of these organizational patterns includes a special kind of ability to grow, change and renew the urban foundation" (Hamidi, Habibi & Salimi, 1997, 1-2).

Some groups of experts have used the term organization in combination with other words to describe this issue. Tavassoli used a similar term "physical urban organization": "The physical organization of the old cities of Iran is shaped based on the spatial connection between the elements of the complex: the city center; neighborhood centers through a series of spaces and connecting elements, main passages and squares. This spatial structure has been socially and economically quite active. Today, this structure and the old parts are not as strong as before and have undergone undesirable changes. Using incorrect planning and adopting

design policies for the entire city have weakened this fundamental component rather than strengthening it" (Tavassoli, 1995, 38). Ghaffari Sedeh defined the term "spatial organization of cities" as follows: "An urban complex as an orderly spatial organization is not created randomly through the proximity of several units, but it is a combination and integrity with its characteristics and principles. Like a living organ, if the necessary measures and operations are not taken to maintain its integrity, it will die and perish. A city is composed of several complexes and has been developed in different organizations and has been combined based on special principles and methods" (Ghaffari Sedeh, 1994, 27). Hamidi et al. also used this term in combination with the "urban skeleton" stating that "The spatial organization is a network of energy and information. Spatial organization is a large-scale organization and information is needed to create a closer connection between the elements and enhance the flow of energy. The urban design considers a spatial organization as a network of communications between living bodies which are subject to growth and change" (Hamidi et al., 1997, 3).

Other scholars used the term "urban system" to describe the subject. Rostampour, Mohammadi Yegane and Heydari for example, used this term as follows: "though urban systems are dependent on social systems, they are in fact examples reflecting political, economic, social and ecological systems. Thus, a set of different systems in space are reflected in the form of an urban system and can be examined and analyzed" (Rostampour, Mohammadi Yegane & Heydari, 2010, 11). Moshfeghi and Rafieian used the same term: "In a general sense, urban systems can be classified into form and functions. The form generally emphasizes the physical patterns, the arrangement of the elements and their composition and explains how the settlements should be presented. The function system reveals the functions of the settlements and the interactions between them. These two components, in combination with social, cultural and economic elements and even political attitudes result in different structures that reflect the internal and external relationships among the units of a spatial complex and show the position of the water components in the physical environment. It is a set of relationships in which the elements can change and even though they are entirely dependent on the whole, they maintain their meaning" (Moshfeghi & Rafieian, 2016, 212). Regarding urban systems, Farshad stated that "Urban systems have been shaped and changed over the centuries by socio-economic conditions. Also, Factors e.g.climatic, geographical, cultural and religious conditions have affected the texture structure of cities" (Farshad, 1989, 105).

Semantic examination

Analyzing the definitions of the spatial organization of cities in the urban planning literature of Iran shows the lack of consensus on this concept among experts. Despite the different and sometimes contradictory definitions, it seems that architects and urban planners have attempted to refer to a concept for interpreting the spatial organization of the city, but the absence of the same meaning has led to several interpretations of this concept. This section examines the content of definitions provided from three perspectives: Appellation, semantic coherence and attributes.

- **Appellation**

An appellation is of the most important elements constituting the identity of definition. Although the name chosen for the word is not the same as its definition, it forms the first link between the audience and the concept and presents a part of the whole concept. The mismatches between the name and concept and the existence of multiple names for a definition are among the barriers that can lead to ambiguity and multiplicity of meaning among professionals. Reviewing the literature on "the spatial organization of cities" in written or translated texts shows that this concept has been used by architects and urban planners under different names. Existing terms are formed under the influence of structure or organization and have been added to urban planning literature.

The term "urban structure" was first coined by a

sociologist named "Burges" in the 1930s and has been used by urban planners since the 1960s. Crane, Bacon and Buchanan used this term to interpret the physical foundation of the city and then it entered the urban literature of Iran by Zekavat and Nourmohammadzadeh (Zekavat, 2013; Nourmohammadzadeh, 2004; Soheylipour et al., 2012; Ahari, 2016; Molaei & Aysham, 2018; Crane, 1960; Bacon, 1978; Buchanan, 1988; Sandalack & Nicolai, 1998). In the late 1980s, "The main urban structure" was used by Bahraini et al. which emphasized the essential part of the city. This term was used in later works (Bahraini et al., 2009; Daneshpour & Rousta, 2012; Namdarian, Behzadfar, M. & Khani, 2017). The two terms "urban spatial construction" and "urban spatial structure" had a similar definition to the "urban structure" used by some Scholars (Anas, Arnott & Small, 1998; Tavassoli, 2007, Haeri Mazandarani, 2013; Babaei-Morad et al., 2016, Montazeri et al., 2017). Hamidi et al. referred to the same concept using "the urban skeleton" (Hamidi et al., 1997, 3).

The term organization was introduced to urban planning in the writings of Tange (1966) and Alexander (2010) when a systematic approach gained popularity in the 1960s. This concept found its way into Persian urban literature by Farshad (1989) who used the term "urban system" (system-e shahari) for this concept. Then researcher used different terms such as "organization of urban space" (Sazman-e fazaei-ye shahr)[1] (Ghaffari Sedeh, 1994; Farshad, 1989; Hamidi et al., 1997; Madanipour, 2000; Behzadfar, 2008; Bertaud, 2004; Rodrigue, Comtois & Slac, 2009), "urban spatial organization" (Sazmandehi-ye fazaie-ye shahr) (Ziari, Asadi, Rabbani & Molaei Ghelichi, 2013; Tange, 1966; Luchsinger, 1981) "urban spatial organization" (Sazmanyabi-ye fazaei-ye shahr) (Dadashpour, Afaghpour & Rafieian, 2010). However, an examination of the existing definitions of the mentioned terms shows contradictory perceptions of this subject, as some have focused on the urban structure in the description of the spatial organization of cities and it seems that these two concepts are not clearly distinguished in Iranian urban planning literature. Also, the existence of multiple terms for a concept indicates the plurality of meaning in experts' minds and there is a necessity for revising the definition of this concept and providing a more detailed definition (Fig. 1 & Table 1).

- **Semantic coherence**

Meaning is the most important part of a definition. One of the conditions for definitions to be able to describe the unknown is semantic coherence. Examining some of the definitions given for the concept of the spatial organization of cities indicates

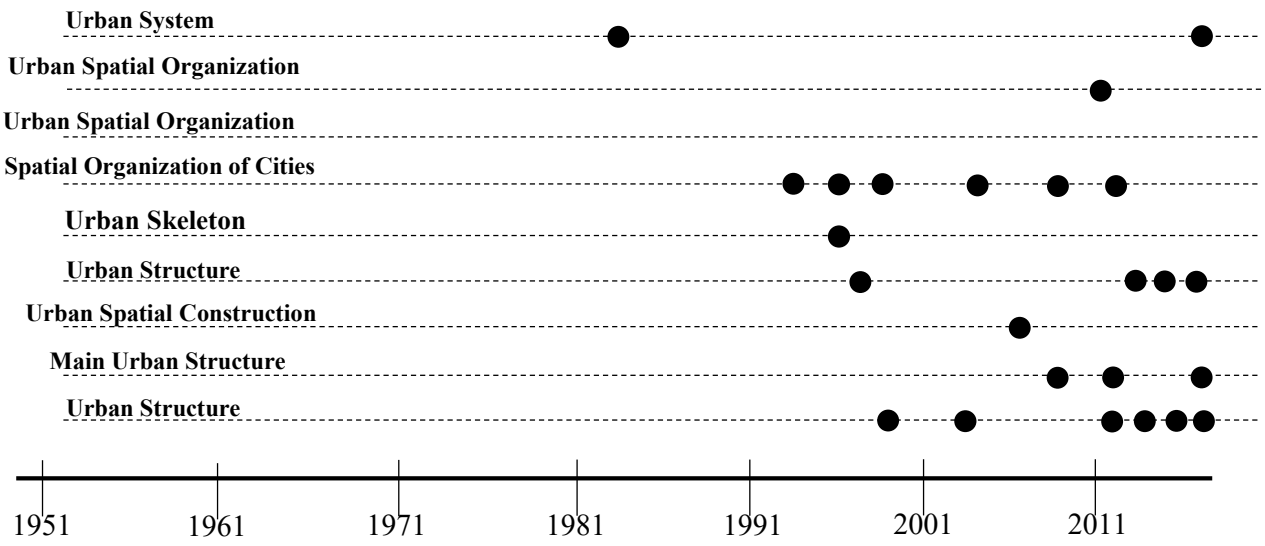

Fig. 1. Terms used by Persian-speaking experts. Source: authors.

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	Terms used by experts	Experts
1	Main urban structure	Bahraini et al)2009), Daneshpour & Rousta (2012), Namdarian et al. (2016)
2	Urban structure	Nourmohammadzadeh (2004), Soheylipour et al. (2012), Zekavat (2013), Ahari (2016), Labibzadeh & Hamzehnezhad (2018), Molaei & Aysham (2018)
3	Urban spatial construction	Tavassoli (2007)
4	Urban spatial structure	Haeri (2013), Babaei-Morad et al. (2015), Montazeri et al. (2017)
5	Urban skeleton	Hamidi et al. (1997)
6	Spatial organization of cities	Ghaffari Sedeh (1994), Hamidi et al. (1997), Madanipour (2018), Behzadfar (2008)
7	Urban spatial organization	Ziari et al. (2013)
8	Urban spatial organization	Dadashpour et al. (2010)
9	Urban system	Farshad (1989), Moshfeghi & Rafieian (2016)

that its meaning is incoherent, for example, in the explanation given by Bahraini et al., the terms mega-form, the superstructure and the main urban structure have been interchangeably used. Though the urban structure is associated with the form, it is attributed to non-physical subjects namely space and function: “In fact, the mega-form, superstructure, or the main urban structure is the result of the shapes, activities and spaces of the city that have outstanding features for formal, spatial, or functional reasons. In other words, the main urban structure is the main part of the city in which the main functions of the city are located and the general features of the city as well as the directions of its future development are determined. This includes the main communication axes, major open spaces and public buildings. In addition to focusing on economic, political, governmental, cultural, religious and leisure activities, this core structure also focuses on social relations. This part describes the main features of the city and creates the sustainability, identity and stability of the city” (Bahraini et al., 2009). According to Daneshpour and Rousta, it is the structure that constitutes the organization. Contrarily to what they say, it is the organization that constitutes the structure: “In every city, although there are elements that change over time, there are components that remain constant in the long run and play an important role in determining the shape of that city ... The main structure of the city is the foundation of the system that controls the phenomenon of the city. In fact, like a meta-system, it shapes and organizes its subsystems, components and main elements of the city. The city, as a physical structure with a distinct and developing body, must have this main structure and its basic elements that form a strong and stable, sustainable and stable body of the city and determine its shape, size, functions and main identity” (Daneshpour & Rousta, 2012, 52). Tavassoli also stated: “The two basic elements of the city’s spatial construction are: the square and the street. These two are the basic elements of the urban spatial construction” (Tavassoli, 2007, 43). The term “spatial construction” is ambiguous, urban construction is not defined in this statement and only its elements and components are defined. However, the definition is not necessarily equal to the components of the definition. On the other hand, these elements and components can include all the streets and squares and the value of these indicators is not described or the distinction between them is not provided. Similarly,

Namdarian et al. argue that "The urban structure and the spatial organization include the main routes, important public buildings and urban infrastructure that play an important role in the daily public life of the city and citizens refer to these vital centers for various purposes" (Namdarian et al., 2017, 209). Although in this definition, the authors have used adjectives such as "original" and "important" to set a value for understanding the concept, these expressions are too ambiguous to be the criteria. Besides, the terms urban structure and the spatial organization have been used synonymously and interchangeably. However, in the authors' words, these two concepts have been alternately introduced as a set and a subset of each other. These definitions contradict one another though they describe the relationship (Daneshpour & Rousta, 2012; Nourmohammadzadeh, 2004; Hamidi et al., 1997). Also, in Babaei-Morad et al.'s description, "the urban spatial structure, which consists of the network of passages and functions, is considered as the main urban organization" (Babaei-Morad et al., 2016, 6). In this description, the authors have not explained the nature of the structure and their definition is limited to some labels for the components. Besides, to describe the concept, they have used the term "network" and this may make readers misperceive that these two terms are equivalent. In general, the existence of contradictions and incorrect propositions and the lack of semantic coherence in the definitions provided for the spatial organization of cities reflect the semantic ambiguity of this concept to experts.

- **Attributes describing definitions**

In definition, it is possible to express the characteristics of the identifier using adjectives. Moreover, classifying the adjective used in the description of the spatial organization of cities help the researcher understand similarities among definitions and differentiation what experts have in their mind. For example, about half of the experts in the definition have referred to the spatial organization of cities as the "source of order" of the city (Zekavat, 2013; Daneshpour & Rousta, 2012; Ghaffari Sedeh, 1994; Moshfeghi & Rafieian, 2016; Farshad, 1989; Nourmohammadzadeh, 2004; Bertaud, 2004; Rodrigue et al., 2009; Sandalack & Nicolai, 1998; Crane, 1960 Buchanan, 1988; Luchsinger, 1981) and there are a significant number of definitions shows the consensus of authors on the attributes such as the "sustainable part of the city" (Ahari, 2016; Daneshpour & Rousta, 2012; Moshfeghi & Rafieian, 2016; Zekavat, 2013; Hamidi et al., 1997; Crane, 1960; Buchanan, 1988; Luchsinger, 1981), "growing and changeable" (Farshad, 1989; Hamidi et al., 1997; Daneshpour & Rousta , 2012; Moshfeghi & Rafieian, 2016; Luchsinger, 1981; Tange, 1966), "meaningfulness" (Hamidi et al., 1997; Ahari, 2016; Ghaffari Sedeh, 1994; Daneshpour & Rousta, 2012; Sandalack & Nicolai, 1998; Rodrigue et al., 2009) and "The foundation of urban spatial-physical organization" (Hamidi et al., 1997; Ziari et al., 2013; Madnipour, 2000; Ahari, 2016; Rodrigue et al., 2009; Crane, 1960). Examining the definitions provided by scholars in the field of architecture and urban planning shows that experts have used various and different qualifiers for the spatial organization of cities, which shows the lack of semantic unity of this concept in urban literature (Table 2).

Structural analysis

The rationality of a definition for explaining an unknown concept and identifying it through available information depend on some conditions which are not limited to semantic content. Based on these conditions, the given definition can limit the semantic domain of a particular concept and separate it from other domains and define that concept. This section examines the structure of definitions in terms of the two principles of comprehensiveness and exclusion.

A definition makes the distinction between the concepts and limits their scope. The plurality of meanings in the discussion of concepts prevents researchers from making accurate conclusions.

Table 2. Qualifiers used by experts for the descriptions of the spatial organization of cities. Source: authors.

	Qualifiers	Experts
1	Source of order	Buchanan (1988), Rodrigue, Comtois & Slac (2009), Sandalack & Nicolai (1998), Crane (1960), Luchsinger (1981), Zekavat (2013), Daneshpour & Rousta (2012), Ghaffari, Moshfeghi and Rafieian (2016), Farshad (1989), Nourmohammadzadeh (2004).
2	Sustainable part of the city	Buchanan (1988), Crane (1960), Bacon (1978), Lüchinger (1981), Ahari (2016), Daneshpour & Rousta (2012), Moshfeghi & Rafieian (2016), Zekavat (2013), Hamidi et al. (1997).
3	Meaningfulness	Hamidi et al. (1997), Ahari (2016), Crane (1960), Ghaffari, Labibzadeh & Hamzehnezhad (2018), Molaei & Aysham (2018), Daneshpour & Rousta (2012), Sandalack & Nicolai (1998).
4	Growing and changeable	Farshad (1989), Hamidi et al. (1997), Daneshpour & Rousta (2012), Moshfeghi & Rafieian (2016), Lüchinger (1981), Tange (1966).
5	Foundation of urban spatial-physical organization	Hamidi et al. (1997), Ziari et al. (2013), Madnipour (2000), Ahari (2016), Rodrigue et al. (2009), Crane (1960).
6	Distinction	Bahraini et al. (2009), Zekavat (2013), Sandalack & Nicolai (1998).
7	Hierarchy	Buchanan (1988), Nourmohammadzadeh (2004), Farshad (1989).
8	A set of relationships	Tange (1966), Bertaud (2004), Rodrigue et al. (2009), Ziari et al. (2013).
9	Purposefulness	Bacon (1978), Nourmohammadzadeh (2004); Soheylipour et al. (2012).
10	Compound shapes	Hamidi et al. (1997), Ziari et al. (2013).
11	A product of urban shapes, activities and spaces	Bahraini et al. (2009).
12	A product of Motorization network	Buchanan (1988).
13	Ability to reorganize	Hamidi et al. (1997).
14	Integrity	Soheylipour et al. (2012).

Therefore, before discussing any subject, any discipline attempts to define its basic concepts to give a crystal clear and comprehensive picture of the objects to which is related and address the ambiguities. The science of logic defines definition as the set of known ideas that help an unknown idea be discovered and the unknown concepts that are shed light by known ideas are identified (Khansari, 1987). However, the purpose of the definition is not only to identify the unknown but sometimes to analyze a concept to understand its content and to re-identify it. Khansari states that a definition needs to meet six conditions[2] to clarify the defined, the most important of which is being comprehensive and being exclusive:

- The principle of comprehensiveness: Definition should not be narrower than identifier because in this case, not everyone or everything is included. The definition should be comprehensive enough to include all people; that is, the definition should include all the defined (ibid.).

- The principle of exclusion: Definition should not be broader than the identifier. That is, it should not be more generalized than its identifier because in this case, the defined includes other people while the definition should exclude (other than what is intended to describe) and they should only introduce the identified and nothing else (Muzaffar, 2006).

The logic of science is based on “definition” and “reasoning” Before entering into any scientific subject, its concepts must be defined in advance to make discussion and argument on a single concept possible. The spatial organization of cities is one of the basic concepts in the interpretation of the city, which has been defined by experts in different ways. The analysis of the definitions in the urban planning literature of Iran shows that architects and urban planners have provided definitions based on their

perception and sometimes do not have the features of a "definition". In this section, these definitions are examined through the lens of logic.

• The principle of comprehensiveness of the definitions of the spatial organization of cities

The principle of comprehensiveness refers to the inclusion of all the components and properties of the concept. If the definition fails to contain all the properties of the concept, it will be an "incomplete" definition. Examining the definitions of experts based on a comprehensive criterion shows that many definitions are too comprehensive to cover the properties of the spatial organization of cities. Some definitions have only stated the components and have not provided a general description of this term and have not explained its nature. For instance, in Behzadfar's definition, only the components of the concept have been explained and the general description for this concept has not been provided. According to Behzadfar, the spatial organization refers to a network of three components: Urban centers (e.g. refers to centers with mixed uses such as commercial, managerial and cultural, etc on the scale of the whole city and its regions and districts), important communication axes (e.g. main roads and subway), Important functional axes and general uses (on the scale of the city and its regions and areas) (Behzadfar, 2008). Similarly, Bertaud only addressed the factors that shape the concept and did not explain it in general: "the urban spatial structures are shaped by market forces interacting with regulations, primary infrastructure investments and taxes" (Bertaud, 2004, 5). Madanipour limited its definition to the components of the spatial organization of cities and maintained that shaping the spatial organization has occurred throughout history and under the influence of a variety of factors such as geological, historical, cultural and this organization is a vector of urban physical and metaphysical forces (Madanipour, 2000).

Some definitions provide general descriptions and do not mention components. For example, in Rodrigo et al.'s definition, the spatial structure has been introduced as a set of connections but its components and properties have not been stated: "The adaptation of the spatial organization to the physical environment is called the spatial structure. This structure shows the arrangement of the elements of the city and explains how they relate to each other concerning communication axes, the realm or geographical areas; In other words, the spatial structure refers to a set of communications develops based on the urban form and the crowd of people, transportation and the flow of goods and information" (Rodrigo et al., 2009, 54). Lüchinger also provided a general description of this concept and described relationships among the components of a spatial organization, but did not provide any explanation about these components, their purposes and functions. According to this approach, the spatial organization, or so-called structure, is based on the organization of forms and determined by architectural form and it is the main part regulating urban life. The structure is a complete set of relationships in which elements may change while they remain dependent on the whole and retain their meaning. The whole is independent of the elements in terms of relationships. Relationships among elements are more important than the elements themselves. Elements are interchangeable but relationships are not (Lüchinger, 1981, 16).

Criticizing previous definitions, Ahari proposed a strategy for explaining the new definition, but this strategy failed to provide a precise and all-inclusive definition of the subject: "Identifying such a structure using spatial analysis approach, which combines typological, morphological and semantic approaches and concepts with various structures, can determine the main part of the city. This part forms its symbolic foundation and the stable part of the city and on which other parts of the city are formed. Thus it defines the shape of the city or a structure, which is compatible with hydrography and ups and downs of the earth" (Ahari, 2016, 64). Nourmohammadzadeh also emphasized the nature of the system in its definition but did not mention its components and functions in this definition: "The

arrangement of the elements or organization of the components of the system in line with the system's purpose requires establishing relationships between the elements and components within itself and this relationship is called structure. The relationship between the components constitutes the urban system and their interaction (activity and function) gives meaning to the relationships and is called urban structure" (Nourmohammadzadeh, 2004, 50-51). Similarly, in his definition, Zekavat provided a general description and mentioned advantages of structural to non-structural model: "The structural model of the city includes the continuity and emphasis on forms that shape the urban spaces and its form order and structure of mass and space are different the general granularity of the city context" (Zekavat, 2013, 79).

Some definitions also refer to some of the components or provide a general description of the concept. For example, Tange limited its definition to communication networks: "A network of energies and communications or a living organ in which growth and change will be constant factors. Creating the architecture and city can be called the process of building visible communication networks in space" (Tange, 1966, 43). Also, in the definition provided by Buchanan, the only component of the system is the city's mobility structure: "The structure of the city's shape and people's perception (in the language of urban design, mental imagination) he has described how the network of mobility is formed: legible order and a hierarchy of spaces and places, as well as the speed and intensity of traffic and other activities ... The network of traffic and public buildings and monuments inside and adjacent (and the mental images that they create in the mind) make the relatively stable part of the city. In this system, buildings can come and go and new buildings are guided by their function, face and personality" (Buchanan, 1988, 33). As a result, the term spatial organization can be considered an unclear concept for experts for which the comprehensive expression of its characteristics are not provided and all components and the relationships among them are not described and their descriptions do not set the boundary for definition and they just provide some necessary parts of the definition.

- **The principle of exclusion of the definitions of the spatial organization of cities**

One of the main conditions of the definition is to introduce only the identified and to differentiate the scope of its meanings and prevent the inclusion of other attributes. Some of the definitions provided for the urban spatial organization have not precluded other meanings and have made the concept ambiguous. For instance, in his description, Tavassoli referred to two components of the spatial organization of cities. However, his definition can include all the squares and streets of the city: "The two basic elements of the city's spatial construction are: the square and the street. These two are the primary elements of the spatial construction of the city" (Tavassoli, 2007, 43). Similarly, in the definition provided by Crane, the components of the spatial organization of cities include "streets, public buildings, open spaces and their facilities" (Crane, 1960, 284). This description does not meet the condition of being exclusive. Despite introducing the term structure, Soheylipour et al. used the phrase of identity and functional elements that is too general. This phrase can include a wide range of urban elements. Therefore, any identical and functional element can be inferred as the spatial organization of cities. The urban structure, in a sense, is the image of the city that includes identity and functional elements on an urban scale as well as the relationships among them. It is the result of interactions among economical, natural aspects, infrastructure, rules, taxes that have shaped the over years (Soheylipour, et al., 2012). Also, the spatial organization was defined by Hamidi et al. as energy and information network, the scope of this network was not clearly defined: "Spatial organization is a network of energy and information. Spatial organization is a large-scale organization and … information

creates a closer connection between the elements and … the flow of energy. The main field of urban design refers to a spatial organization as a network of communications and living organs subject to growth and change" (Hamidi et al., 1997, 3). In their definition, Montazeri et al. (2017), used "environmental-natural, socio-cultural factors, economic, political-managerial, human, physical factors" to refer to different dimensions of the city phenomenon. However, his definition was too general to make the distinction of the main issue possible. Therefore, analyzing the above definitions show that the structures of some of the urban planners' definitions do not follow the maxims of logic and this has caused ambiguity in the meaning of this concept. The lack of exclusivity of these statements suggests that the proposed definitions lend themselves to multiple interpretations and prevents experts from discussing a single subject. Reviewing Iranian urban literature has shown that experts have several interpretations of this concept in mind.

Conclusion

It has been over two decades since the concept of the spatial organization of cities entered the urban literature. Despite that duration, examining the definitions provided by Persian-speaking experts show the multiplicity of meanings and a lack of consensus among scholars. The results of the form and content analysis of the existing definitions can be summarized follows:

1. The existence of several terms indicates the semantic ambiguity of this concept among Persian-speaking scholars and shows that Persian terms for many definitions have been limited to its literal aspect and developed based on the tastes of authors and translators;
2. The terms "spatial organization of cities" and "urban structure" have been interchangeably used by experts and sometimes have been used as a subset of each other;
3. Many definitions show the internal contradiction and have incorrect premises. From the logical perspective, these contradictory and incorrect propositions create ambiguity. Therefore, some existing definitions are too semantically incoherent to describe this concept;
4. Numerous different adjectives are used for its definition, indicating that there is no consensus among scholars about this concept;
5. Many of the definitions given are too incomprehensive to include all aspects of the spatial organization of cities. Since these definitions cannot describe all the attributes and functions of this concept, they are so-called incomplete definitions;
6. Some existing definitions lack a distinctive semantic domain. These definitions have led to the inclusion of opposite adjectives in this concept and the definition does not distinguish the intended meanings. These definitions also create ambiguity and result in multiple and unwanted interpretations of the concept.

Therefore, due to the numerous logical problems existing in the definitions of experts, each researcher is likely to rely on his incorrect definition of spatial organization and obtain unacceptable results. This has happened many times among Iranian experts who have discussed the spatial organization. The table below shows that the plurality of forms and meanings of the definitions of the urban spatial organization reveals that its literature has been influenced by the taste of the writers (Table 3). Therefore, this research highlights the necessity of redefining the concept of urban space organization in Persian architecture and urban planning literature by experts in this field. Also, the definition should have appropriate content features in which the conceptual aspect of the appellation is considered, there is semantic coherence in the internal logic of the definition and finally, it can describe the concept with the correct attributes. Besides, this definition should be comprehensive in terms of structure and provide all the semantic features of the concept. It should also be exclusive enough to differentiate this concept from other concepts.

Table 3. A comparison of the definitions of the spatial organization of cities. Source: authors.

	Experts	Term	Definition	Component	Function
1	Ahari (2016)	urban structure	- Sustainable part of the city - Symbolic foundation of the city - compatible with hydrographic and ups and downs of the city		Determining the shape of the city
2	Bahraini et al. (2009)	- the main urban structure - mega form - super structure	- A product of urban shapes, activities and spaces - Having a prominent feature	- Communication axes - Major open spaces - Public buildings	- Explaining the direction of development
3	Bertaud (2004)	spatial organization of cities	A product of interactions of the market forces with regulations, initial investment in infrastructure and taxes		
4	Behzadfar (2008)	spatial organization of cities		- Urban centers - Functional axes Major applications	
5	Buchanan (1988)	structure of the urban shape	A product of Motorization network Sustainable part of the city	- Traffic network. - Monuments Public buildings	Directing the function, face and personality of new buildings-
6	Bacon (1978)	urban structure	The essential part of the city related to the public aspect		Creating the urban shape
7	Tange (1966)	urban spatial organization	- A network of energies and communication - Living organ		
8	Tavassoli (1995; 2007)	urban spatial structure		- Square - Street	
9	Hamidi et al. (1997)	- urban skelton - organization of main urban structure	- A combination of backbone and urban network - The foundation of the physical organization of space in the city - A Filler between the main sections and the sub-sections of the city - It shapes the symbolic network of the city	- Functions - Urban elements	- increasing cohesion of the whole city - Influencing artificial and natural urban patterns - Influencing the cultural, social and economic characteristics of the city - Creating a memory of the city
10	Zekavat (2013)	urban structure	- Continuity and physical emphasis - Physical order - A distinct structure from the granularity of the city - The result of the intervention on the primary organs of the city		
11	Daneshpour and Rousta (2012)	main urban structure	- Old city component - The source of order		- Determining the shape of the city - Determining the size, function and identity of the city
12	Rodrigue et al. (2009)	spatial organization	- Compatiblity of the spatial organization with the physical environment - Arrangement of the city elements - Certain geographical areas in relation to each other - Communications facilitated by the form of the city, the gathering of people, transportation and the flow of goods and information		
13	Ziari et al (2013)	spatial organization of cities	The product of forces, relationships and various urban factors	- Market force - Activity force - Infrastructure force - Service force	

	Experts	Term	Definition	Component	Function
14	Sandalack, & Nicolai (1998)	urban structure	- City organizer - Giving meaning to		Including public realm
15	Ghaffari Sedeh (1994)	spatial organization of cities	- Combined or organized with specific principles - It is a picture of the city. - It Includes identity and functional elements	-Multiple sets	Spatial arrangement of places and activities
16	Farshad (1989)		- A purposeful whole - Part of the more general system of climate and civilization - Includes more detailed systems - Existence of system and rules	- Elements - linkages	Performance in the general climate and civilization
17	Crane (1960)	urban structure	- Symbolic places - Continuity of space-shelter - Original construction - Systematic rhythm	- Streets - Public buildings - Open spaces -.Their facilities	
18	Labibzadeh & Hamzehnezhad (2018)	urban structure	- Influenced by geometric and free systems	- Meaningful and symbolic values	
19	Lüchinger (1981)	- urban organization - urban structure	- The basis of physical order - An Urban life organizer - A set of stable relationships based on the whole and the changing elements		
20	Madanipour (2018)	spatial organization of cities	A product of the interaction between physical and metaphysical factors of the city.		
21	Montazeri et al. (2017)				
22	Molaei & Aysham (2018)	urban structure		- Natural-environmental factors of the city - Artificial factors of the city - Political factors - Legal factors, - Military factor - Economic factors - Socio-cultural factors Religious factors	- A tool for identifying the city - A system governing the phenomenon of the city
23	Moshfeghi & Rafieian (2016)	urban system	A set of stable relationships based on the whole and the changing elements		
24	Nourmohammadzadeh (2004)	urban structure	Organizing elements based on the target the system	Traverse and horizontal components	

Endnote

1. Mansouri believes that the prevalence of the term "organization of urban" is associated with an independent chapter in Tehran's new master plan program. The proposal of this plan with the title of first step studies was prepared in 2002. In 2003, it was handed over to the Tehran Municipality's Deputy for Urban Planning and Architecture (Mansouri, 2007, 60).
2. In his book, "Mantegh-e Souri", Khansari states six conditions for defining a concept; 1) being comprehensive; 2) being exclusive; 3) Identified and defined should be in contrast; 4) It should be clearer; 5) The general premises should be explained before the specific ideas; 6) Strange and vague expressions should be avoide (Khansari, 1987).

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