Persian translation of this paper entitled:
باغ ایرانی فراتر از یک باغ زمینی: معماری باغ و امکان تأثیر آن در طراحی فضاهای سبز شهری
is also published in this issue of journal.

DOI: 10.22034/jaco.2022.327953.1231

Original Research Article

Beyond an Earthly Garden: Iranian Garden Architecture and Its Potential Influence on Urban Green Space Design

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Received; 03/02/2022 accepted; 12/03/2022 available online; 01/04/2022

Abstract

With the increase of the world's population and the densification of urban spaces, urban residents are getting disconnected from natural green spaces. Association with natural and green spaces, one of the basic needs of people, is directly related to health benefits (e.g. physiological and mental). However, health researchers argue that the health benefits of urban green spaces are associated with people's constant exposure to such spaces. Therefore, designers must identify and employ the factors that encourage people to use these places more frequently. Hence, traditional garden architecture, which is a legacy reflecting the cultural values of each country in organizing the natural environment, can be a good source for extracting the types of designs that create the context for individuals' constant communication with such places. In this regard, to answer the question of "whether the architecture of Iranian gardens can serve as a guide for designing urban green space or not", we used aesthetic analysis and identified the factors that create a sense of beauty in Iranian gardens. Semiotic analysis assisted us in evaluating the used symbols and signs in the garden architecture. To understand the concept of garden architecture, which makes the Iranian garden a distinct place, we used a phenomenological analysis method.

Keywords: *Urban green space, Iranian garden, Garden aesthetics, Garden semiotics, Garden Phenomenology.*

Introduction

As the urban population grows and cities become denser, urban managers and planners face countless challenges in providing the context for sustainable urban development. According to the United Nations report, 54 percent of the world's population lives in urban areas, and its dimension is expected to increase by 66 percent by 2050 (UN report, 2014). This report indicates that it is imperative to provide the basis for responding appropriately to challenges that have arisen. Urban green spaces are one of the important factors in the sustainable development of cities that can respond to many challenges in the proper context. Apart from the role of urban green space in improving environmental quality in cities, such as reducing air

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pollution or lowering the ambient temperature, it can provide a context in which people can benefit from public health by having access to these places (Carpenter, 2013; Maas, Verheij, Groenewegen, de Vries & Spreeuwenberg, 2006; Richardson, Pearce, Mitchell & Kingham, 2013; Triguero-Mas et al., 2015). However, health benefits can occur when people are in constant contact with such places. Therefore, designers and planners must identify and use the factors that motivate people to use these places more frequently. In fact, creating a sense of belonging by using architectural elements that are familiar to the park visitor can encourage them to have frequent associations with such places. Since Iran benefits from vernacular garden architecture, with proper analysis of this architectural method, we can extract green space compatible elements and use them in the design process.

In general, gardens are cultural products and the carriers of traditional culture. Composed of various material forms, the garden contains a lot of social and human factors (Abbas, Nafisi & Nafisi, 2016, 511). Hence, gardens are one of the world's most valuable legacies and for Iranian, they manifest their specific views to the natural world. The Iranians built gardens for a specific purpose and over time, they generated special ordering systems. These orders were used as a guideline to organize the environments and give physical expression to the ideas and world views of the Iranians that intended to make their ideal places.

In these ideal places, demands were obvious and these aims were accomplished by exclusive methods, by differentiation of their gardens from surrounding environments and eliciting a sense of beauty, Iranian tried to display garden as an earthly paradise (Kazemi & Darskhan, 2014, 218; Rahaei, 2015, 99; Sheibani & Motallebi, 2015, 8). To achieve a sense of beauty in the garden, Iranians made specific schema and patterns to organize the elements inside the garden that awareness of the beauty to make an imaginal place that reminds us of the Eden garden (Farahani, Motamed & Jamei, 2016, 5; Shahidi, Irani Behbahani & Khosravi, 2012, 135).

Accordingly, all Iranian attempts throughout history were to realize this vision. Therefore, careful analysis of the Iranian gardens is helpful to understand and achieve a clear picture of Iranian garden architecture that gives physical expression to their demands in the garden and the role that Iranian specific view generates ordering schema to make a garden as an earthly paradise. Hence, the present study will enrich our understanding of Iranian garden architecture by using analytical means to evaluate the design method.

This research is an analytical study examining the Iranian concept behind garden architecture. research process was divided into four phases: first, this study discusses how specific ordering schemes change the physical environment to create aesthetical experiences; second, Iranian symbolic architecture is studied and third, the architecture of Iranian gardens are analyzed from the phenomenological point of view to understand how Iranians made their gardens a special place. Finally, in the next step, based on the results obtained in these three phases of analysis, the possible contribution of the architecture of the Iranian gardens to designing urban green spaces is assessed.

Literature review

In terms of the aesthetics of the Iranian garden, Mansouri (2005, 59-63) states that aesthetics is rooted in basic Iranian humanistic concepts of nature and landscape elements. He maintains that the interaction of different features in the garden is a system of dual aesthetics; on the one hand, it is based on received perceptual and pleasure for the human senses, and on the other hand, it has an iconic figure and symbolic personality. Then, by naming elements such as “infinite views”, “the presence of

water", "spatial diversity and independent spaces", "interaction with nature instead of absolute naturalism or conflicting with nature", "sensational landscape (place for reflection)", "rectangular geometry", "introversion", "two-color garden; the two predominant colors (green color and the color that is taken from the soil), he introduces these elements as the common constructive aesthetic elements in the Iranian garden. Also, Masnavi, Mohseni Moghadam & Mansouri (2019, 7), conclude that the principles of aesthetics in the Iranian garden are rooted in the basic Iranian humanistic beliefs about nature, which are expressed in the structure of elements such as rectangular geometry, spatial diversity, the presence of water, and infinite landscape view. Then, by expanding their inference, these researchers have tried to conclude that applying the aesthetic principles in the urban parks, could lead to improving the quality of space and creating a sense of belonging to these places.

In terms of semiotics, Toosi & Emamifar (2011, 62-65) state that, the Iranian garden is a context with different contextual layers that are in interaction with each other. To perceive the context, they evaluated the context from six perspectives, such as the relationship between garden structures with "contextual layers", "the iconic image", "visual and auditory signs", "its repetitional rhythmic order", "metonymy concepts and their associated meaning", "the spatial accompaniment of the elements, and receiving the codes and signs in the garden". Further, they inferred that, since the elements of the garden are purposeful and predetermined and they are presented in a systemic geometric shape, they have been able to play an important role in beautifying the garden as much as possible to create a kind of message in the garden. Therefore, symbols and signs have special characteristics and concepts.

However, in terms of phenomenology, which introduces the garden as a unique place, we can mention the study of Bemanian & Saleh (2012, 65). In their study, they examined the Iranian order in garden architecture has been a system of place formation in all phenomenological dimensions of this concept. For this purpose, they carried out analytical and descriptive research methods, analyzed the existing gardens before and after Islam, and identified the components and spatial indicators in the Iranian gardens. They mentioned that the components of a natural phenomenon that creates a sense of place are "centrality", "enclosure", "territory and boundary or dialectics of inside and outside", as well as the components of artificial phenomena or characters with subgroups of "orientation" and "identification" that make the Iranian garden as a special place. For another type of inference about the garden as a different place, we can refer to the study by Shahcheraghi (2010, 81). In this research, to analyze the process of perception of the Iranian garden environment, she used the finding of environmental psychology and theories of behavioral learning as well as perception and cognition in understanding and comprehension of the semantic system of the garden. According to the result of this method, it is concluded that the architectural order of Iranian gardens creates a system of concentration in it by incorporating the stimulating elements of the five senses. This together with the main guiding system of direct movement paths in the garden, provides the kind of environmental quality that invites the visitor to be in peace, as well as contemplation, self-evaluation, and self-flourishing.

Also, to study the characteristics of the Iranian garden and to use these aspects in the design of urban green space, we can refer to the study by Aliyas & Masoudi Nezhad (2019, 1-8). By assessing the historical gardens of shiraz, they tried to study the gardens from physical, social, and psychological aspects, and they concluded that bonding with the

place (as a psychological factor) and feeling safe (as a social factor) were more associated with garden visitation, and in the following section, they explained how to use these features in green space design. In a different study, they have investigated the garden of Chehel-Sotoun, the old Iranian garden, and its role in improving the level of social interaction. Their study concludes that the Iranian garden, because of its features can increase social interaction, which is an important feature that should be considered in green space design.

In brief, it can be said that researchers in all three areas of aesthetics, semiotics, and phenomenology of Iranian gardens have analyzed each of the elements on a case-by-case basis. However, the present study is an attempt to use these analytical tools together to be able to understand the ordering system in the Iranian gardens, which organizes the environments and elements inside the garden. This is important for the present study because it can be used to investigate the use of the Iranian ordering system in the design of urban green spaces.

Research method

The present study employs field study along with library research to assess the Iranian garden. For the field analysis, Iranian gardens in different places with different climates were visited, and also related books, journals, and websites in different fields were reviewed. This investigation is specifically relating to four main areas; 1) the aesthetical analysis of the Iranian garden, 2) the Iranian garden and semiotic analysis of the garden, 3) analysis of Iranian gardens from the phenomenological perspective, 4) using Iranian garden architecture in designing of urban green spaces. The reason for choosing three analytical tools is that each of these methods offers a special perspective from a different angle of Iranian garden architecture that can use to assess the possibility of using garden architecture in designing urban green spaces. The keywords that are often used in search of journals and website goes as follows; in the field of aesthetic, "definition of aesthetic", "landscape aesthetic", aesthetics in Iranian garden" and the field of semiotic, "semiotic in architecture", "semiotic and green space", semiotic and Iranian garden", "symbols and signs in the Iranian garden", and for phenomenology analysis, "definition of phenomenology", "garden as an especial place", "the phenomenology of the Iranian gardens". And also, in the field of urban green space and public health the keywords were: "Urban green space", "green ecosystem", "public health and green space", "physiological health and green space", "psychological health and green space".

Theoretical foundation of the study

The evaluation of the obtained information from field study as well as library research in the present study is based on a specific method in a defined system. The type of evaluation in this form is mainly derived from the results of studies selected for the present study. Accordingly, in the field of aesthetics, the method of analysis is based on the evaluation of form and in the next stage, the evaluation of the elements in the garden, also in the field of semiotics the evaluation of the Iranian garden is based on two methods of objective and subjective assessment and finally, in the field of phenomenology, the analyses will be based on the assessment of the role of main architectural elements in the Iranian garden. In the following, all these aspects have been used to investigate the role of these features in designing urban green spaces with the outcome of health benefits (physiologically / psychologically) from these places. In Fig. 1, the basics for choosing the studies, criteria for selection and finally ordering path of the interrelation of topics and subcategories that are presented in the current study has been shown.

Finding and discussion

•The Iranian Garden

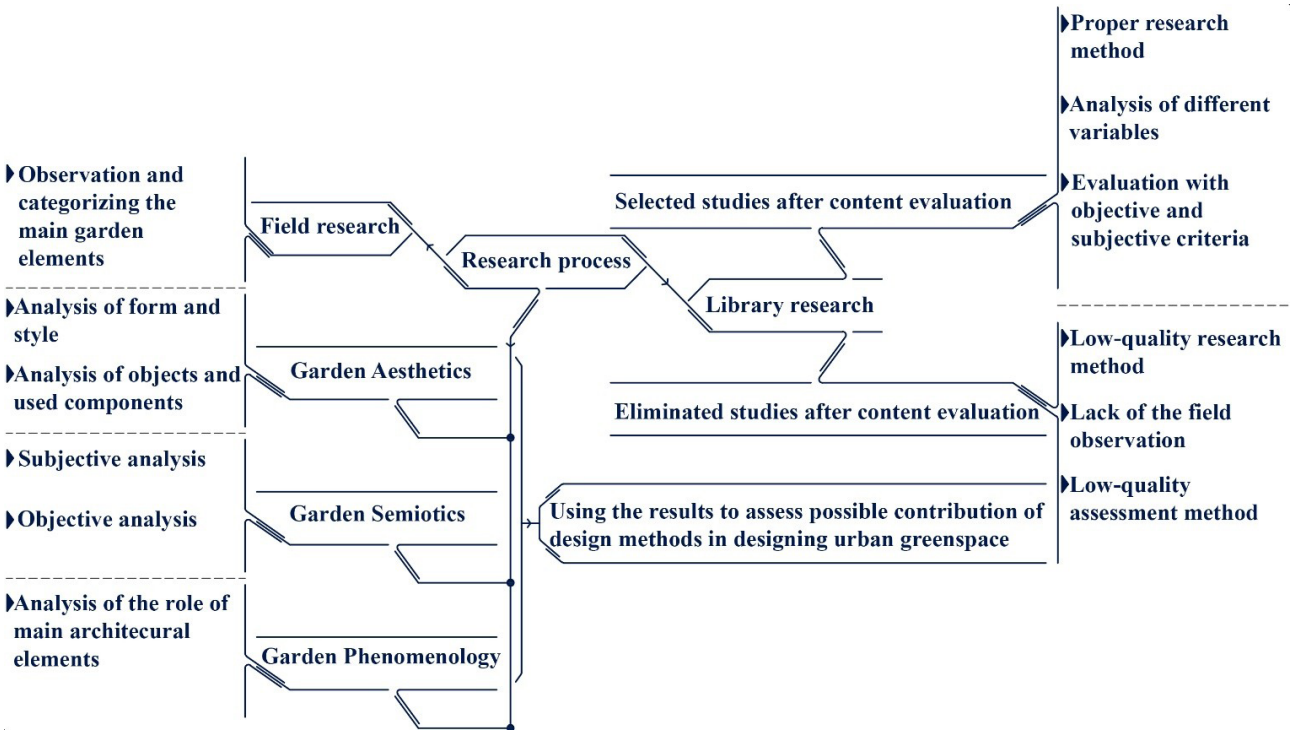

Fig. 1. Theoretical structure of the study. Source: Authors.

Many studies infer that a garden is a specific place that embodies human thoughts, including their beliefs and cultural values in the natural world (Ansari, Taghvaee & Mahmoudi Nejad, 2008, 101-124; Roberts, 1996, 229-237; Uwajeh & Ezennia, 2018, 79). This makes the garden area separate from other natural environments. Related studies indicate that the Iranian appreciation of nature started when they had begun to settle with making a small garden in front of their houses. This may be the reason why Arthur. U.Pope once at the lecture said: at the corner of every Iranian mind there is a garden (Javaherian, 2010, 62). There is no exact date to indicate when Iranian started to make their gardens, however, historical records estimate that the origin of the Iranian garden may go as back as 4000 BCE (Mirrazavi, 2011, 3).

According to Fig. 2, It can be said that Chahar-Bagh design was considered as the most comprehensive and common design in terms of garden designing in Iran, and it was frequently used differently based on the environmental properties and kind of garden application (Khademi, Kabiri & Khan, 2013).

The main pavilion and central water basin, most often sit at the intersection of the principal axes, and some smaller basins are placed on the secondary intersections like central structure, all the water basins and plant beds are formed in the geometrical shapes in the garden, even single decorative detail follows the same pattern (Mohammadzadeh Kive, 2012). Another feature of the Iranian garden that can be seen in almost all Iranian gardens is the high walls and trees along the walls whose main function is to protect from the climate conditions of the outside world. In general, the Iranian garden is not in harmony with its surrounding, rather it is mostly in contrast with the local environment that is usually separated by high walls because of harsh climate conditions outside.

Nevertheless, apart from the apparent structure of the Iranian garden, several conceptual elements play role in creating this structure that to analyze

Fig. 2. Typical Iranian scheme for garden architecture. Source: Pirnia, 1994.

them we needed to use analytical tools. In this regard, in the following of the present study, the Iranian garden will be evaluated from the viewpoint of aesthetics, semiotic, and phenomenology to have an understanding of the principles and concepts that had created the architectural design method in the Iranian garden.

• The aesthetics of the Iranian garden and its influence on green space design

Since this study evaluates the aesthetic of Iranian gardens to extract and apply an architecture method in green space design, therefore, the discussion of garden aesthetics should be evaluated in a specific structure. Also, because gardens along with other urban green spaces are defined in architecture as a subset of landscape design, hence we first discuss the aesthetics in terms of landscape design to determine the framework for evaluation. In this regard, Perry (2013, 1-10) mentioned that understanding landscape aesthetics is related to two components; aesthetical experience which is commonly used by landscape architects as a synonym for style or form. This term refers to the way that we perceive the specific forms and world around us. However, the other is the aesthetic of objects, which refers to the way the aesthetical experience can be proved by objects that have been used in landscape architecture. Accordingly, an aesthetical experience that is given by landscape and gardens refers to the sense and imagine of specific experiences that the user obtains from specific form and style from the organization of environments, as well as objects and components that provoke aesthetical experience.

In the study of the aesthetics of environmental structure in the Iranian garden, the abstract idea in

the organization of the environment in the garden, which involves the aesthetical concept behind the organization of the physical environment, is in first place for analyses to find out the subjective aesthetical values. The main architecture method of the Iranian garden strictly follows a specific rectangular geometry and the organization of the spaces is defined within the body of this specific geometry. Precise geometrical order, symmetry, an axial open-ended continuation, and repetition were the outstanding characteristics of this design method. Unlike western gardens, geometry and symmetry in Iranian gardens are not based on perspective and optic sciences, but on a very pure unity and integrity whose example is evident in the pattern of Chahar-Bagh (Alavian Sadr, Vakil & Talebian, 2010, 47).

The result of creating the geometry of the Chahar-Bagh is the creation of a one-point perspective view, and this principle leads to the openness to the main axis and main viewpoint (Pirnia, 1994, 2). Hence, the Iranian mainly have architectural elements such as pools and water ponds, tall trees, etc., in the main axes. This was because the person become involved with all of his gaze and senses as he stepped into the garden. The disposition of the axes and the location of the buildings all have been chosen in accordance with the view to distant landscapes (Irani Behbahani & Khosravi, 2010, 253). All of these factors are there to drew vision toward the main perspective to engage emotion and evoke the sensation of beauty.

In explanation of photographic view presented in Fig. 3, which shows Shazdeh-Mahan garden, we can refer to the conclusion of Rahnama and colleagues, that retrieved from a lecture of Daneshdoost (1984, 214-224), that says, when you arrive at the place you think of a very big garden in the area. Indeed, the design tricks your eyes to have simultaneous sight of real and virtual picture continuousness (Rahnama & Pouremad, 2013,1153). High trees

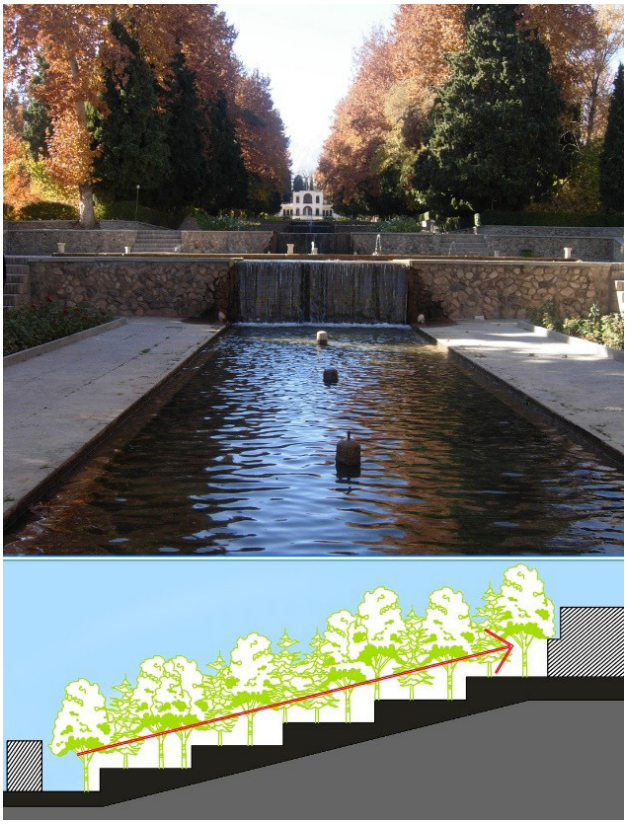

Fig. 3. Shazdeh-Mahan Garden, view from the main axis to the garden's main building. Source: Authors Archive.

that are embedded in the main axis, closely confine us on two sides, limit our view to the free space in the main axes toward the main building in the garden and create a feeling of compression that makes us look upward at the building and the light far overhead. That is why we feel a physical sense of release through spiritual movement, which creates a sense of beauty by capturing the special vision.

In the study of the placement and arrangement of architectural elements in the Iranian garden from the aesthetical point of view, we can notice that harmony and unity play important roles in the arrangement of elements inside the garden. In fact, this kind of architectural style is seeking to attract the viewer's attention by capturing the vision at first glance with unique harmony and unity to cultivate a sense of beauty. Creating symmetry and harmonic

repetition of elements helps to achieve unity even in the smallest components. For example, dividing the garden into four or eight parts or more can also be seen in small components such as paving or tiles inside the water pounds.

To create additional beauty in the garden, along with harmony and unity, Iranian have used other elements as well. For example, ornamental plants and flowers were often planted in the pathways, and ornamental trees were placed next to other trees so the blossom of these trees add more beauty to pathways. A combination of evergreen and deciduous trees along with the blossom and fruits of various trees and ornamental flowers create a unique fusion of different colors in the Iranian garden. In addition, other elements such as water flow were used to evoke a sense of beauty in the visitors. The flow of water, aside from its functional role, plays a key role in providing coolness, reflecting the glare of the sun and pleasant sounds (Irani Behbahani & Khosravi, 2006, 83).

In general, by analyzing the aesthetic of the Iranian garden, we can notice in this type of architecture there is a unified design structure that can be used in the planning of urban green space, both in terms of the general shape of the environment with regular geometric divisions as well as in terms of the aesthetics of architectural elements, that result of which leads to mental health by evoking pleasant feeling and creating a sense of beauty.

• Semiotics of the Iranian garden and its application in green space design

A sign does not have an absolute nature, rather it gets its meaning from the context that it has been used as well as existing social contracts (Ghodrat, 2009, 17). As mentioned before, creating a sense of belonging is important to encourage people to use green space. To create a sense of familiarity in the green space, the use of concepts derived from the type of perception of subjective values can be important. Thus, semiotics can be a good source for extracting the subjective nature of the elements involved in the process of an environmental organization. In a sign-system, the sign itself has no meaning, then in a sign-system, the codes generate the text, hence whenever a sign is selected in a real communication interaction, in the context of discourse it becomes as a text or in a better term, a layer of text, because the sign, in addition, to receive the sign values form the code, acquires the meaning of discourse in interaction with other textual layers (Sojoodi, 2005, 61-62). Considering the Iranian garden as a text, its concept is in service of the idea that considers garden as a representation of paradise, then all codes are completely in the service of this purpose. Thus, the garden-paradise represent the unity of heaven and earth and the divine order found its expression in the earthly order; specifying a location, taking water there or (bringing it to life), restricting it in four parts, according to the idea that exists from the creation of the universe, and finally, planting trees in the garden (Ghodrat, 2009, 92). In fact, the garden is a full set that is made of objective elements and we know it has materials, shapes, colors, and textures that together define the text of the garden (Toosi & Emamifar, 2011, 62) and the codes from which they receive its general meaning of signs are subjective. Therefore, we can say that signs and symbols in the Iranian garden are the links between objective

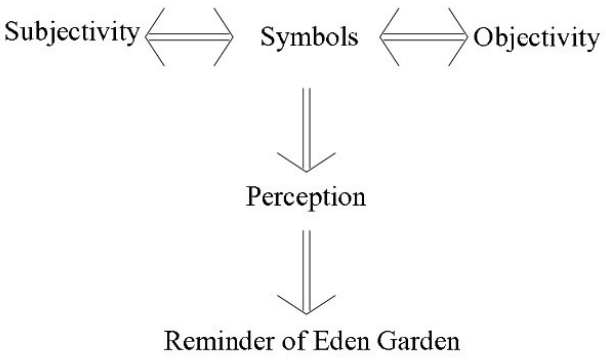

Fig. 4. The role of symbols in the Iranian garden. Source: Authors.

elements and subjective concepts that remind us of the Garden of Eden (Fig. 4).

Iranian to make an illustration in person mind through the existing images in the context tried to make a connection with meaning and concept in the subconscious mind of the visitors, which Iranian have done this purpose with an indication of place as an imaginary space (Fig. 5).

In this regard, Gayyoomi (2007, 38) states that one of the reasons that man needs codes is the gap between his conscious and the unconscious memory, and also he continues, imagination through the language of code, connects a person's subconscious to his conscious, though its massage is typically hidden. But on the other hand, the language of code, including what is represented in architecture like dream requires to be interpreted which is the Iranian garden architecture seeks to create an imaginary and eternal space that has a kind of timelessness in its text (Ghodrat, 2009, 103). In fact, the use of this concept goes back to the Iranian pre-Islamic belief. In this regard, Javaherian quotes from Henry Carbone that the imaginal world exists between two kinds of perception, the world of objectivity and spirituality. This kind of attitude that separates consciousness into two kinds of perception existed in the Iranian thoughts before and after Islam and is rooted in Zoroastrian beliefs or, «duality». All spiritual and mystical experiences form in this between the world (duality). As represented in Fig. 6, in the Iranian garden, the projection of paradise imagination in ethnic unconscious memories has always existed (Javaherian, 2010, 60).

The garden is an earthly space and at the same time is an iconic symbol, and the relationship between the garden and its main theme, which is the representation of paradise, is the similarity of these two. In fact, the garden is an expression of another form of paradise, which is absent. It can be said that because man had seen heaven in the beginning, he had its image in his mind and after his descent from heaven, he wanted to create what he had seen before. It can be interpreted that the descent of man from heaven has been effective in shaping the garden (Toosi & Emamifar, 2011, 62-63). The Iranian Garden is the combination of specific elements in the specific geometrical arrangement. If we consider the Iranian garden as a textual layer, its function is to remind us of the garden of Eden in the unconscious mind, so it can be said that garden elements that form textual layer are the codes and all these codes refer to a specific meaning (Table 1). Hence in the following, the elements of the garden and their symbolic concept

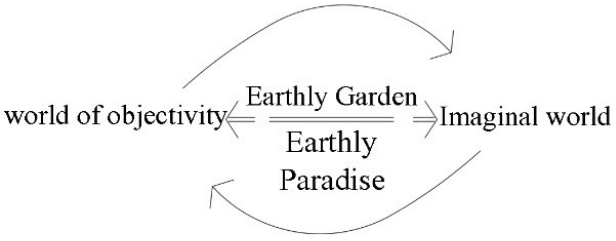

Fig. 5. The dynamic relation of objective space with imaginary subjective space. Source: Authors.

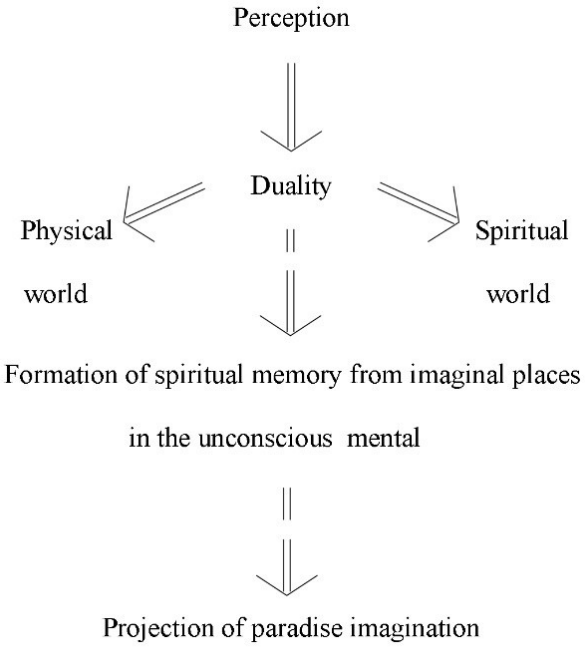

Fig. 6. Duality is the idea that shapes the imaginal world In the Iranian garden. Source: Authors.

will be assessed.

The first distinctive elements that we can notice at first glance are the walls that separate the garden from the outside environment. The objective and concept of the outer walls are to separate and sanctify the place of the garden (Ghodrat, 2009, 98), and then, how and the way of entrance to this special place becomes important. Indeed, the concept and the type of architecture that embodies the entrance of the garden are derived from Iranian Islamic beliefs. The Iranian-Islamic archetype culture is based on the triple division. This pattern arises from the beliefs of the Iranians from two elements of "light and darkness" that form the top, bottom, and middle themes. Also, according to Zoroastrian belief, the world was divided into three parts; upper which is composed of light, a lower world which was equal to darkness, and a middle world which is considered as a meeting point between these two (Barati & Kakavand, 2016, 9). Also, Barati & Kakavand (2016, 11) add, the entire Iranian worldview is shaped by moving from darkness to light. An example of architecture based on this concept can be seen at the entrance of Fin-e-Kashan garden, one enters through a labyrinth of narrow passages (Sabzalian, 2013, 81) one crosses a dimly lit path and enters a bright space. This type of entrance can be compared to one passing from life in the present world to the afterlife. Another element of Iranian garden architecture is the general geometry of the garden. The garden that represents a different and sacred space is initiated by the organization of the environment through a geometric figure based on symbols and sanctuaries that are reminiscent of paradise. That is why four-part divisions have been used in the organization of the environment. The first garden, which is considered to be the first representation of the four-garden model is the Pasargard Royal garden (Heydarnattaj & Mansouri, 2009, 18). According to Khademi, Faranak, and Khan (2013, 66), the number "four" is the holy one. It shows four cardinal points (north, south, east, and west), four basic existence elements (water, wind, soil, and fire), the year seasons (spring, summer, autumn, and winter), as well as the number of square sides and angles. This geometric structure was preserved after Islam because the number four also has a special place in Islam, as Beizaeijouybari and Gungor (2016, 100) state, four represents the four-level of the Quran. Also, the organization of the main axis is in accordance with creating depth based on perspective laws in landscape architecture to evoke endless space (Toosi & Emamifar, 2011, 62). Another element that can be seen in the Iranian garden is the presence of water. According to Zarghami, Mahdi Nezhad & Fatourehchi (2015, 123), water is mentioned in four ways in the Quran; 1) supreme being has placed its throne on water, 2) water as a rain fall and giving life to the earth, 3) water cleanliness, and 4) describing the water streams in the heaven. Zarghami et al. (2015, 124-126) state that water has been used in the garden in three ways; 1) water streams that are reminiscent of running water in the heaven (Fig. 7), 2) water that stopes and then passes through the building which reflects light to the inside of building with

Fig. 7. water streams in Shazdeh-Mahan Garden. Source: Authors Archive.

giving the sense of coolness and purity, 3) water in large pools is usually in front of the main building to reflect the spirituality, silence, and peace, and also a reflection of the light spectrum into space to create an Imaginal space (Fig. 8).

However, perhaps we can say that gardens main building has special importance, for that it is located at the intersection of garden paths. The symmetrical geometric structure of the garden shows ultimate perfection and the placement of the building in the center is the indication of timelessness (Ghodrat, 2009, 98). Gardens main building is usually octagonal and its eight-sided shape is derived from the belief that considers number eight sacred (Rahaei, 2015, 99) and also according to the Qurans descriptions of boiling water in paradise usually main building is the source of water stream in the garden (Zarghami et al., 2015, 123).

Water originated from inside the main building, which is located at the intersection of the main axes that an example of this can be seen in Fin-Kashan Garden. The used plants' species depending on the type, also have their meanings. Trees in the Iranian garden is the symbol of connection between earth and heaven and based on the type; that evergreen represents timelessness and immortality and deciduous and fruit trees refer to blessed fruitfulness and fertility and also flowers are to show the beginning of spring (new year) that refers to the concept of rebirth (Ghodrat, 2009, 98).

Fig. 8. Water basin, in the garden of Dolat Abad-e Yazd. Source: Authors Archive.

In the following section of this research, to provide a summary in this section and to use architectural elements according to their symbolic meaning in the design process of urban green spaces, these elements based on their meaning are summarized in (Table 1).

• Phenomenology of Iranian garden and its application in green space design

Regarding the necessity of phenomenological analyses, we can mention Bognar's conclusion about the inadequacy of semiotics that refers to Norberg-Schulz (1975, 5) statements about this issue, which says “architecture cannot be satisfactorily described using the geometrical or semiological concept’, and then Bognar continues that; semiology alone has proved to be insufficient to reach full perception. Building upon the pioneer works of such phenomenological philosophers, scholars have extended their probe of visual architectural communication into the more complex field of the synesthetic reality of the nature and human-made environment. This reality involves not only the functions of the eyes and mind but also the multidimensional capabilities of the human body and intuitions (Bognar, 1985, 183).

In the phenomenological approach, each place is analyzed in the form of two components of space and character, and identification of each place will be possible only in the form of such a division scheme (Bemanian & Saleh, 2012, 63). Space refers to the three-dimensional structure of the elements that make up a place, and character refers to the general atmosphere that is the most comprehensive property of any place (Karnama, Masoudi & Rafati, 2016, 238). The goal in phenomenology assessment is to receive objective

Table 1. Semiotic analysis of Iranian garden architectural elements that can be used in urban green space design. Source: Authors.

Elements	Sign
Walls	Emphasis on the special and heavenly nature of the space
Entrance	Crossing from the earthly world and stepping into the heaven
Geometry	Representation and remembrance of paradise in the unconscious mind about sacred concepts derived from pre-and post-Islamic religions
Water presence	Reminiscent of water streams in the heaven
Main building	Referring to evolution and perfection
Trees and plants	Based on the type, referring to immortality or coming back to life (resurrection)

environmental information with senses, turn it into a subjective understanding, and induce a different environmental experience. Therefore, in this regard, Shahcheraghi states that the amount of information and knowledge that received from the environment depends on the diversity and degree of contrast of sensory information and how they are separated from each other, i.e., how patterns are tracked and this is possible with the help of all the senses and the degree of differentiation of spaces (Shahcheraghi, 2010, 75).

To achieve architectural patterns in green space design using the type of Iranian garden architecture, it should be noted that, in the Iranian garden, to create a different sensory experience, specific architectural patterns have been used which has created a different spatial character. This principle has been created in Iranian garden architecture by using natural characters as well as spatial characters in a specific architectural order (Table 2). Natural characters refer to the use of different plant species and trees to create a different environment and space characters include a spatial arrangement in the form of a specific organization in architecture, which will be analyzed in the following.

- Enclosure walls

Apart from its functional role, the wall has the role of identifying and transforming the space into a special place (Mansouri, 2016, 6-13). As Khademi and colleagues' inference from Ardalan & Bakhtiar (1973), walls are the necessities of this holy place to be characterized and separated; it is the place in which soul is felt and its spiritual demand is fulfilled. There should make a pure and relaxed atmosphere, as well as depleted from any tensions and malice, between the interaction of figure and the surface such a stable figure and be found in the cube which is a complete shape whose symbolic essence is made up of stability, humanity, and terrestrial paradise (Khademi, Kabiri & Khan, 2013, 66-67).

- Spatial hierarchy

The assessment of the Iranian garden shows that Iranian used the spatial hierarchy to achieve a sense of spirituality, beauty, comfort, and readability in the Iranian garden to make the garden space a special place. Therefore, it can be said that the hierarchy in the Iranian garden is the spatial relationship of architectural elements that exist from the entrance to the most important part of the garden step by step in the form of spatial hierarchy.

- Oriented elements based on the main axis

As mentioned before, the basis of the geometric structure of the Iranian garden is based on the fourfold divisions, and this organization determines the passage of individuals from the

Table 2. Elements in the garden as a phenomenon that can be used in designing urban green space. Source: Authors.

	Characters	Occurrence as phenomenon
Natural characters	Plant's species	Different plant species and trees; creating a green space in the middle of the desert, making a contrast with the surrounding environment
	water presence	Apart from the functional role (irrigation system), used as an architectural element to create a sense of coolness and evoke different emotions
Spatial characters	Wall closed	Separation, identification, emphasis, and reference to the differentness of the space
	Spatial hierarchy	Spatial and architectural elements arrangements in accordance with the importance
	Axis-based organization	A guiding system towards achieving a specific goal, along with architectural elements to evoke a sense of purposefulness, exploration
	Transparency of spaces	Applying kind of architecture that prevents ambiguity to avoid confusion to understand the environment easily

main axis and sub-axes. The movement in the Iranian garden is mainly such that one starts his movement from the lowest part of the axis and opposite direction of the water stream and continues to the most important part of the garden the main building, which usually is the source of water. On the way to the main building, one can see a beautiful combination of vegetation flowers, water and architectural elements, and the shadows created by a variety of trees along with a sense of coolness due to the presence of shade and water stream that all effects people senses. Therefore, the system of the geometric structure of the Iranian garden defines direct and purposeful axes, which based on research in environmental psychology, such paths give a sense of purposefulness, reflection, and exploration. The main orienting system in the Iranian garden, along with a system of concentration, creates a favorable environment for pleasant privacy, gaining peace and contemplation for human beings (Shahcheraghi, 2010, 78).

- Transparency of the space

One of the most important aspects of the Iranian

garden is using a kind of architecture that prevents any ambiguity and confusion so that people can easily understand the environment. This feature that makes Iranian gardens unique places without any ambiguity in people's minds is called transparency. Hence, in the Iranian garden to establish and form communication and interaction directly with a viewer without any mediation, creating transparency was an important factor. In this regard, as Shahcheraghi (2010, 77), quotes from Mirfenderski (2004, 10), that says "in the Iranian garden ultimate objectivity is promoted to the ultimate spirituality. Then garden built as much as possible simple and clear objectivity that leaves no ambiguity in the relationship between viewer and space".

In this section, to have a clear evaluation of the Iranian garden's architectural elements from a phenomenological point of view that can be used in designing green space, these elements are presented in (Table 2).

• **The Iranian Garden architecture and its influence on designing urban green space**

In general, today the traditional garden architecture in the cities defines as an open space that is a subset of urban green space. Green spaces in urban areas can be announced as a man-made natural environment built for a specific purpose. Based on the findings of the researchers, for the continuously growing cities, accessibility to the natural green spaces is one of the basic urban resident's needs. Constant association with these spaces improves public health (Maas et al., 2006, 587-592; Richardson et al., 2013, 318-324). Public health in relation to green spaces includes physiological health (Liu, Li, Li, & Zhang, 2017, 223-230; Pietilä et al., 2015, 44-45) and also psychological health (Mitchell, 2013, 130-134; Van den Berg, Maas, Verheij & Groenewegen, 2010, 1203-1210). Considering the fact that historical gardens are the combination of cultural values of every region, along with architecture methods that reflect these values, they can serve as the guideline for developing urban green spaces in the cities. But the important question that arises here is that Iranian traditional garden architecture is capable to use as a guideline to create the kind of spaces that could benefit people's health at both mental and physiological levels.

To answer this question, we need to understand variables that play important role in psychological/ physiological health conditions related to green spaces. In relation to physiological health, one of the indications for public health that associate with green space which is often mentioned by studies is physical activity (Dadvand et al., 2016, 161-167; Pietilä et al., 2015, 44-54; Van den Berg et al., 2019, 1-23). Then green spaces should provide a setting for physical activity. Looking at the Iranian garden and its general scheme in the organization of the environment, we can notice the paths that are connected to each other, without being blocked. It is an endless pathway that can encourage people to take long walks or related physical activities.

In addition, as we know, the Iranian gardens are mostly situated in a hot arid climate, but the Iranian special architecture role, could overcome this situation and create a pleasant environment in thermal points inside the gardens. Studies show that the architecture of Iranian gardens not only improves the climate condition inside the garden, it can also improve local microclimate conditions as well (Ojaghlou & Khakzand, 2019, 1-33; Rezaei, Habib & Shahcheraghi, 2021, 1-10; Taghvaei, Tahbaz & Mottaghi Pishe, 2015, 35-56). This is important because the use of Iranian garden architecture as a pattern in urban space design can improve the temperature conditions inside and around the green space. As a result, it can protect people from the harmful effects of heat stress, and pleasant thermal conditions inside the green space encourage people to engage in physical activity. As a result, these two factors improve people's

physiological health.

In relation to mental health, the importance of this issue is that compact city environments and mechanical life along with environmental problems in the cities can easily lead to psychological disorders. However, many studies showed that experiencing natural environments and green areas can be beneficial for psychological health (Van den Berg et al., 2015, 1-38; Dadvand et al., 2016, 161-167). Looking to the result of these studies indicate that in relation to the green areas, psychological health occurs with relieving the level of stress and anxiety and also by facilitating the social interaction among the residents. Considering the Iranian garden, as presented specifically in the aesthetical and phenomenological analysis, we can infer that, despite the chaotic nature of the surrounding environment, Iranian with a special design method managed to bring peace and pure calmness to the space. In short, all these happened by special hierarchy and orders like separation of the inside from outside, controlling the ecology of the inside by green elements like trees, vegetation masses, and ornamental flowers and also adding pureness to the space by water that circulates in and around the environment. Thus, it's clear that by using these design methods in urban green space we can create an environment without any tension that users can gain mental calmness and as the result, it can benefit society's psychological health level. As the relationship and interaction of influencing factors have shown in Fig. 9, in general, we can say that by using Iranian garden architecture and a specific design method in designing urban green spaces, we can create an environment that benefits the user's health condition both physiologically and psychologically.

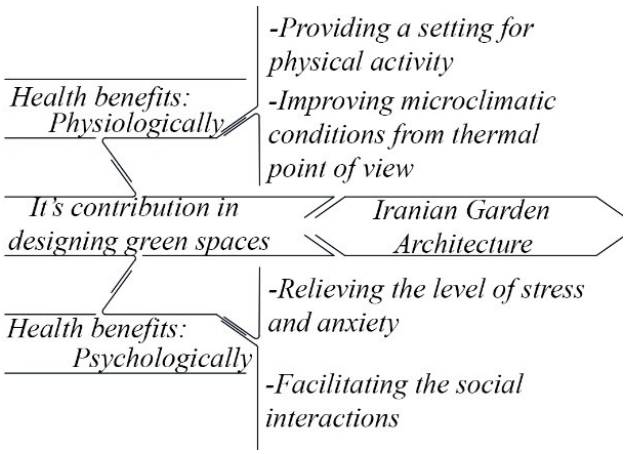

Fig. 9. Interaction of influencing factors in designing urban green spaces based on the Iranian garden architecture method. Source: Authors.

Conclusion

A basic criterion in designing urban green spaces is taking the factors and features that provide conditions for health benefits into account. Present research by assessing the Iranian garden architecture has evaluated the factors that can be used in designing urban green spaces, and considering these factors in the design process can lead to health benefits. In response to the question posed in the research process, "whether Iranian garden architecture can be used as a guide for designing urban green spaces that benefit people's health condition (physiologically/psychologically)?" this study used analytical tools of aesthetics, semiotic and phenomenology, that results of which are listed below:

Aesthetic assessment of the Iranian garden indicates that the Iranian garden provides a setting for physical activity that we can use this type of method in designing urban green spaces. Also, semiotic analysis was helpful to understand the factors rooted in the Iranian beliefs and cultural values that create environmental physical structure. In fact, these factors can create a sense of belonging, which results in encouraging people to use these spaces more frequently, and using green space more often relates to health benefits.

Phenomenological analysis has helped us to identify factors such as; spatial hierarchy, internal and external separation as well as spatial transparency,

and using these factors can prevent the hustle-bustle condition of the outside environment from entering inside urban green spaces. This is important because people can rest and relax in a peaceful environment or they can have social interaction in pleasant conditions and both of which lead to psychological health.

Therefore, we can say that using Iranian garden architecture can be a good source for designing urban green space and the findings of this research can be helpful for urban green space designers.

Compliance with ethical standards

All images used in the present research were taken during the field study of the gardens. The authors declare that the procedure was in accordance with the ethical standards, The authors did not receive any financial support for this research from any individuals, institutions, or companies, and there is no conflict of interest for the authors to declare.

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HOW TO CITE THIS ARTICLE

Javadi, R. & Vasigh, B. (2022). Beyond an Earthly Garden: Iranian Garden Architecture and Its Potential Influence on Urban Green Space Design. *Journal of Art & Civilization of the Orient*, 10(35), 65-82.

DOI: **10.22034/jaco.2022.327953.1231**
URL: http://www.jaco-sj.com/article_147211.html?lang=en