Studying Ten Principles of the Wholeness Theory established by Christopher Alexander in Jamshidieh Park Design in Tehran, Iran

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ABSTRACT

Growth of population in cities in the past 40 years has resulted in growth of residential areas, however, little room have been allocated to open spaces and nature (Giulio, Holderegger & Tobias, 2009). In the last decade of the 20th century, the public attention towards parks, green spaces and their design as means of preserving nature and bringing liveability to urban environments have increased (Özgüner & Kendle, 2006; Salazar & Menéndez, 2007). Jamshidieh Park, an urban park with strong natural features located in Tehran-Iran, has lost the aforementioned goal (Pasban Hazrat, 2009). This research will introduce ten principles presented by Christopher Alexander (2002a) in the “wholeness theory”. It will try to reach a new method for studying the reasons for the failure of the expected goals of the Jamshidieh Park. By doing a case study, this researcher has used variety of qualitative methods. The results indicate that only some of the principles were found in the design process of Jamshidieh Park. The findings show how these principles can be incorporated in the design process of urban parks. Further, the methodology used in this research can be applied in future studies of urban park design to gauge usefulness.

Keywords: Design, Living Structures, Liveability, Urban Park, Wholeness Theory, Christopher Alexander
INTRODUCTION

Rapid population growth, expansion of cities and the increasing of the residential areas has caused a lack of open spaces. This result has separated cities from nature. Open spaces play an important role in cities. They have always considered as important components of urban design. They provide an opportunity to bring nature into urban life. Therefore, there is an increased demand to allocate more land for public green spaces such as urban parks (Salazar & Menéndez, 2007). Such places make cities liveable and attractive to live in through providing different opportunities such as psychological, social, economic, aesthetic, recreational and environmental benefits (Chiesura, 2004; Chen, Adimo & Bao, 2009; Jim & Chen, 2010; Whyte, 1980). Green spaces affect human health and well-being (Chiesura, 2004; Pacione, 2003). Additionally they can positively affect an individual’s mood. They are able to reduce the pressure and stress of urban life and places; green spaces stand as an escape route for people from the daily routines of city life (Grahn & Stigsdotter, 2010). In addition, green spaces can calm the mind by removing mental fatigue (Jim & Chen, 2010). According to Francis (2006) urban parks are places which offer essential, life-enhancing qualities; they are also able to build a sense of community and improve quality of life. They provide places for people to interact and connect with each other (Whyte, 1980). The physical structure of every environment, including parks, impacts its functions and qualities, and affects people, their behaviour and their lives (Alexander, n.d.b; Golı’cık & Thompson, 2010; Mehaffy, n.d.b; Smith, Nelischer & Perkins, 1997; Whyte, 1980). On the other hand, the way a community uses a park directly affects the structure and design of the park. So what makes a park or any urban space most valuable is its design. In Iran, little room is allocated to open spaces and parks (Pasban Hazrat, 2009). Moreover Pasban Hazrat (2009) holds that these spaces are not well-designed to provide human needs. Jamshidieh Park, located between the city and nature areas, has the ability to benefit the city and its residents. The primary purpose of the park was to create an urban space that preserved natural features so as to give people an opportunity to be away from the chaos and crowd of urban life in Tehran. But over time it has lost most of its functions and most of its spaces are not welcomed by people. Consequently, the park now receives fewer visits by users. In addition, despite detailed studies during the design process, the park fails to work as it was supposed to (Pasban Hazrat, 2009).

In order to study the reasons for the failing of Jamshidieh Park, the current research focuses on principles presented in the ‘Theory of Wholeness’, presented by Christopher Alexander (2002a). His theory provides a new worldview toward design process which is able to adapt to human needs. Alexander (2002a) believes he has identified the only way which is able to bring humane quality and a sense of life and liveability to every space without being hostile to human activities. The adaptation of this theory with its idea of urban parks as urban spaces which are objects in cities would be appropriate.

The primary purpose of this research is to study whether the principles laid out by Alexander’s theory are present in Jamshidieh Park. By studying the theory as applied to the park (if any), this study will present a way in which the park can be a liveable place in attracting people and meeting human needs. This research would not apply this particular theory to redesign the park. Rather, it will study and identify if the principles of the theory and its ideas have been applied in the urban park design process by the park’s designer.
With the above aims in mind, it should be mentioned that the main goal of this research is to answer the following question: “Are the principles proposed by the wholeness theory present in the urban park design (in the case of Jamshidieh Park)?” In order to meet the goal of this study, three objectives will be undertaken:

**Objective 1**: To identify the wholeness theory presented by Christopher Alexander.

**Objective 2**: To examine if principles suggested by the wholeness theory are found in the park design.

**Objective 3**: To recommend the incorporation of wholeness theory principles in the design of urban parks.

**WHOLENESS THEORY**

Modern humans’ perception of the world is greatly impacted by science – most importantly by physics. While some scientists believe that the science of the 20th century was based on physics, the science of the 21st century is based on biology (Alexander, 2002a; Bortoft, 1996; Salingaros, n.d.). In the modern scientific world-picture, the parts of the world are to be viewed through mathematical models or mechanisms. These scientific conceptions try to get a true understanding of the world and discover interrelationships among the phenomena. In other words, they try to define what happens in the universe. In current scientific conceptions everything is seen as separated objects in the universe. The world is made up of separate objects which are independent of the observer. In this worldview everything is explained as a mechanism. It interprets our responses to the environment as a mechanism. Some scientists believe that in this worldview people are nothing but meaningless machines (Alexander, 2002a; Bortoft, 1996). This worldview has ignored a part of humanity; the part which deals with feelings; the part that is involved in humans experiencing the world around them. On this view, the world is considered to be a machine, which is separate from a human’s spirit (Alexander, 2002a).

The scientific-mechanistic worldview has indirectly impressed people’s cosmology and activities. It controls their thoughts and affects their behaviour. On this view, people tend to interpret and analyze everything in the world through mathematics and models. From this analytical perspective everything is explained as a cause or an effect. In this view, the universe cannot be understood by human qualitative experiences. The mechanistic view tells very little about the deep order which exist in the world. In recent centuries people have been habituated into thinking in this kind of mechanical manner (Alexander, 2002a; Bortoft, 1996). As a result, during the second half of the 20th century, many scientists began a serious attempt to repair the world-picture. This attitude came from a confluence of quantum physics, system theory, chaos theory and the complexity theory, fractal, nonlinearity, biology, genetics, and other sources (Alexander, n.d.b; Bortoft, 1996, Hanson, n.d.; Salingaros, n.d.).

Christopher Alexander (2002a) believes that the 21st century is an era where all signs of life, humane quality and liveability have been gone from our cities and urban spaces. Most of these spaces are not able to respond to human needs (Alexander, 2002a; Salingaros, n.d.). Alexander in his seminal book, “*The Nature of Order (2002)*”, makes an attempt to find a new
way to improve the current situation of our environment. He claims that his theory is able to reintroduce human quality and liveability to urban spaces. Alexander (2002a) states that his work is more about changing the worldview on the principles of a new architecture and a new society. Brian Hanson (n.d.) holds that Alexander is one of the rare scientist-architects. Alexander’s work does not only refer to architecture and design; it is more about a new science (Alexander, n.d.a; Mehaffy, n.d.a; Salingaros, n.d.). In order to reach his aim, Alexander (2002a) has tried to capture the nature of liveable things and the order behind their structure. Discovering this aids him in identifying basic laws of the world. The sense of wholeness which exists in natural forms is inspired by the existing order in them. As a result, Alexander (2002a) claims that understanding these laws could help us create living forms. He mentions that all the order in the current world-picture is explained by science and it is a mechanical order (2002a). But the order which he is trying to explain cannot be understood and explained mechanically. In the mechanistic picture, people separate all parts from each other and from themselves (Alexander, 2002a; Bortoft, 1996). Understanding the conception of order helps to incorporate the structures which Alexander calls ‘living structures’. Living structures are defined as every structure, natural or man-made, with humane qualities which make people feel happy, comfortable and belonging (Alexander, 2002a). Further, Alexander holds that what makes a living structure is its wholeness, and one of the main problems of built environments in current urban spaces is they lack integration between different parts and so have no sense of wholeness to them (Alexander, 2002a; Alexander, n.d.b). He concludes that this lack of wholeness leads to a lack of living structures and the lack of liveability in our urban environments. His theory, then, starts with a conception of wholeness. In the last two decades, this conception has begun to develop in almost every branch of modern science to get a proper understanding of the physical world (Alexander, n.d.b). Alexander states that, this concept is an essential part of architecture and design. Every time we try to build or design, we participate in the greater wholeness of the world (Alexander, n.d.b). Alexander (2002a) tries to show a more holistic picture of the world – a picture which sees things in their wholeness and their interrelations. He believes that wholeness is something real in the world; that wholeness is a mathematical structure existing in space. The wholeness is made of parts, and the parts are created by wholeness. In this way he defines wholeness as a structure which is made of various, coherent entities and their relations (Alexander, 2002a). David Seamon holds that wholeness, whether natural or human-made, is the source of coherence in any part of the world (Seamon, 2006). In order to get the idea of wholeness, he calls these entities ‘centre’, which is as the basis of all living structures (Alexander, 2002a). Alexander (2002a) mentions that by using the term ‘centre’, he refers to a physical set. He believes that a centre is not a point, but rather a field of organized force. In addition, he holds that this idea of ‘centre’ is fundamental to the idea of wholeness (Alexander, 2002a). The wholeness of any part of the world is the connected system of larger and smaller centres (Seamon, 2006). Centres are defined in terms of other centres. That is, every centre is made of other centres in different scales. As the centres help each other more, the wholeness becomes stronger.

Throughout his work Alexander (2002a) proposes a process which is called, a “living process” in order to create living structures. He believes that this process is the only way to create living structures and life, and that it leads to a harmonious whole. He states that it is not the process which he has invented; it is exact the same process which nature acts to create livable structures (Alexander, 2002b). Alexander presents a humanistic, scientific and artistic methodology that every building and city is created by a living process. Here, his emphasize is mostly on process. That is, the way that nature works. In this way the living processes
appear as processes of step-by-step adaptation where each step must preserve the structure of what has been made before. It is an adaptive process which allows the whole to guide the formation of the parts created. On his view, this is the exact process which nature acts to create living structures (Alexander, 2002b). At every moment there is a need to be aware of the whole and to control it. Through this understanding, Alexander defines ten structure-enhancing actions. He holds that, by applying them, the liveable quality would be attained. These actions are:

a) Step-by-step adaptation;

b) Each step helping to enhance the whole;

c) Always making centres;

d) Allowing steps to unfold in the most appropriate order;

e) Creating uniqueness everywhere;

f) Working to understand the needs of clients and users;

g) Evoking and being guided by a deep feeling of wholeness;

h) Finding coherent geometric order;

i) Establishing a form of language that rises from and shapes that things are made of;

j) Always striving for simplicity by which thing becomes more coherent and pure (Seamon, 2008).

METHOD

This research is a qualitative study with one case study: a park in Tehran, Iran. In order to answer the research question, the information about the process of park design and its structure, is collected. In this way, three methods are employed to get data: review of documents; interview with designer; and site observation. The information obtained through documents reviewed is comprehensive. Two different sources of documents are used. The first source is, “The Nature of Order” by Christopher Alexander. In this text, he shows how the principles of his theory have been applied in real cases. His method helps identify the way to study the site, factors and variables which need to be studied in the process of data collecting and analysing in order to study his theory. The second source used in this study is, “Design in Nature” by Gholamreza Pasban Hazrat, the designer of Jamshidieh Park (the case study), which has been awarded —The Aga Khan Award for Architecture. The book is one of the most impressive projects of park design with regards to the value of nature in Iran, Tehran. This document includes every detail about the park, including maps, pictures, design processes, structure and the design principles used. Most of the information required to analyse the park has been obtained by studying Hazrat’s book.
The interview with the designer of the Jamshidieh Park was done in a face-to-face session; it involves in-depth open ended questions. That interview was developed in a very flexible way, and was conducted by the researcher in a way to get the required information about the design process of the Park. Note taking was a strategy which the researcher used during interview to preserve information. The questions mostly related to the design principles and the process of design that was applied by the designer. In order to prevent any bias during the interview, the principles of theory were not asked directly. The intent of the researcher was to indirectly gather the designer’s idea about theory, its conception and principles through the explanation of the process of design. In order to achieve the latter, questions were asked based on those which have been established by Mark Francis (1999) in his case study methodology for landscape architecture. The other method that the researcher was engaged with was observation which provided important information that would triangulate the interview results.

In order to gather the required data, site observations were carried four different times: two times in the middle of week days, and two times during weekends. On each occasion, it took this researcher between one and two hours to visit the whole site. Observations were also video-recorded, allowing the researcher to carry out more detailed observations when not physically at the site. The main purpose of the observation was to identify the existing ‘centres’ at the research site based on Alexander’s wholeness theory, and to identify how the centres present were related to each other – how they intensify each other, and which centres were most liveable.

The Site of Study

Jamshidieh Park was established as a memorial to Jamshid Davallu Qajar – a Qajar Prince that dedicated this garden to Farah Diba, former Empress of Iran. Farah Diba decided to give the garden to the public as an urban park. The park was designed by the architect, Gholamreza Pasban Hazrat in 1978 with the cooperation of other architects. It was developed during the reign of the Pahlavi dynasty (1925-1979), but has been extensively upgraded and maintained since the Iranian Revolution in 1979.

Jamshidieh Park is located north of Tehran, in the Niavaran district, at the foot of the Kolackchal Mountains. It is triangular in shape. Its original design was completed in 1978, and redesigned in 1991. The old garden contained three main axes. The first axis in the eastern part of the park contains old trees. Narrow, and with a slipping slope, this area was considered to be the main axis of the park.

The axis was covered by old plane-trees in two sides which were irrigated by streamlet. The second axis was the central axis; most of it has been ruined. This axis consisted of stairways and a terrace. It was almost unparalleled with the first axis and needed to be reconstructed.

The third axis was located in the north part of the park and was designed as an east-west axis. Trees, mostly pine, surrounded this axis. At the end of the western part of the third axis was an empty open space lacking trees. In this empty space, there was another open space at the foot of the mountain with divergence in surface. The main part of this space was encompassed by a rectangular pond which acted as the water supply of the garden (Pasban Hazrat, 2009).
The design principles implemented by the designer to make the garden an urban park were based on the site slope. This preserved the existing trees and the structure of the garden in adaptation with the topography. Because it was decided that the old garden would be made into a public park, an adaptation of the old garden to the new function was needed. To reach this goal, the user’s needs needed to be considered and the conditions of the garden that would co-ordinate with the new function needed to be preserved. There was a need to change some parts and make some new parts. As was noted earlier, the park contained natural features. These features were needed to keep people close to nature. As a result, after studying the site, five design principles were extracted by the designer. They included: a) preserving the structure of the garden, including pathways, pool and trees; b) choosing the stone (from the mountain) as the main material; c) shifting the sufficient stone from the mountain and using them in a natural way; d) designing every space according to existing natural elements; and e) maximum usage of water in pathways. In addition, new functions were defined: an open air amphitheatre; a greenery; a restaurant; a playground for children; a resort for climbers; a centre for meditation; a pond; some places to sit and breath; spaces for hiking; and some new entrances.

**Data Analysis**

Based on reviews of Alexander’s theory, the first, and most important, thing to do is identify ‘centres’ as variables and find the relation between them. In the first step of analysis, the main centres of the park should be determined. These centres, include those which already existed in the park as one system of centres, and those which were defined by the designer to be added to the site based on the needs of users. Also, in this step understanding the actual needs of users is important in defining the main centres. If the designer does not try to understand the actual needs of people, it will be difficult to define correct centres. After defining the main centres, these two categories of main centres should be identified as one system. This means that they should be designed in a way which intensifies each other and can be considered as parts of one whole. This first step is considered as the most pivotal, and difficult, part of the application of the Alexander’s theory. If this step is not observed in the process of the park design, it will loose the main principle of the theory. In the next step, other centres should be identified. In contrast to the main centres, these centres operate on a smaller scale. They must be added to the main centres in a way which intensifies them and makes a whole with them. On the other hand, it can be said that each of the main centres should be defined by smaller centres, which help them to be intensified. In the next steps, these smaller centres should be defined by some other centres in smaller scales. This process of creating centres in different scales continues until a deep feeling of whole between all centres has been created. In conclusion, all of the defined centres in different scales should intensify each other and help each other make one whole. It can be mentioned that each of the centres must be designed in the best possible way. The best way to do this is to strengthen the whole mostly. These adaptations in different steps between all centres should be observed. Furthermore, it should be noted that all the centres ought to be created in a way that has the most coherent order and uniqueness. If this adaptation between different scales exists in a way which intensifies each centre as a unit and helps all centres to be seen as one whole, we may conclude that most principles of the theory have been applied in the design process.
RESULT AND DISCUSSION

The results show that just some of the identified centres in the park strengthen each other. Most of the new functions and centres, which were defined and added by the designer, became isolated from other centres and could not preserve and enhance the whole. There were no adaptations between them and the other main centres already existing in the site. Only a few of the defined functions and centres by the designer were adapted to the pre-existing centres in the land. Taken together, these made a coherent system of centres and a coherent geometrical order. Overall, in the design process, only some of these 10 structure-enhancing actions have been applied. Based on Alexander’s theory, most of the problems in the process of design derived from the lack of two fundamental principles. First, there is the lack of attention to the user’s real needs. This leads to the isolation of main centres. Second, there is a lack of success in the combination of the two systems of centres as one whole; one defined by the site and other defined by the needs of users. According to Alexander (2002b), the systems of centres play an important role in making wholeness. Based on his theory, two systems of main centres are not well-defined to strengthen each other and make one whole. Thus the park failed to work well. On the other hand, preserving the natural features of the old garden was one of the strengths of the design. Among all presented principles, the new park design observed a respect for the land and nature most highly. As it happened, the designer tried to preserve the old structure of the garden and make the adaptation of some new centres with the land. He defined some functions in relation with pre-existing elements. The other strength of the park was its uniqueness and simplicity in some parts. This happened as a result of respect to the land and nature (another principle of theory). The other principles could only be observed to a small degree in a few parts of the park.

In conclusion, this study tried to develop a new way of looking at the park design process. The outcome could provide some support for Alexander’s theory insofar as they emphasize the validity of his theory. The study reveals how this theory can be used as a tool for analysing an urban park design.

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