



The Role of Architecture-Nature Interaction in the Quality of Place Attachment, Case Study: House-Gardens in Hamedan, Iran*

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ABSTRACT: One of the major aspects of quality of life is place-attachment which is affected by human-nature interactions. Looking at such a critical issue in human settlements requires the study of the relationship between architecture and nature. It is a critical issue in the contemporary literature of built environment and is discussed in specific frameworks such as phenomenology and environmental psychology. This paper evaluates the sense of place and place-attachment through investigating architecture-nature interaction in the built environment. The hypothesis of the research is that there is a correlation between architecture-nature interaction and the quality of place attachment of residents in a built environment. In order to explain and redefine “sense of place”, the basic approach is based on interpreting and considering the relationship between human and nature in house-gardens in which their quality is not affected by high density built environment. The study utilized a multiple case study methodology to investigate the effects of perceiving and experiencing nature in the built environment on the quality of place attachment. Thus applying qualitative methodology, this research focuses on the relationship between human, natural and built environment based on a theoretical framework. In this research a quantitative strategy examines the assumed correlation through investigating the case studies. Also, it is established a hierarchical multi-attribute system of aspects and criteria for considering nature and natural elements as an effectual system. This study reveals the existence of a direct relationship between quality of place attachment and perception of nature in the built environment.

Keywords: Sense of Place, Place Attachment, Architecture-Nature Interaction, Built Environment, House-Gardens, Hamedan.

INTRODUCTION

Place is a critical issue in the contemporary literature of built environment and is discussed in specific frameworks such as phenomenology and environmental psychology. It should be pointed out that in the contemporary built environments, we need to deal with environment from the socio-cultural point of view, rather than scientific view. It should, therefore, focus on this purpose: “to excite people into remembering the richness of the common place and the value of the everyday, to savour the symbolisms

which we have endowed nature, to revalue our emotional engagement with places and all they mean to us, and to go on to become actively involved with their care”(Hayden, 1997, p. 63).

“Sense of place” is a much used expression, chiefly by architects in theory but it is neglected in post-occupied built environments, especially in developing regions in which buildings are growing up in a vast pace. This paper is going to consider and investigate this critical issue of life and built environment based on a framework of environmental psychology. Thus, at the first hand, experience and perception in the environment will be studied as the basic and fundamental concepts in investigating human-built-environment interactions. In the other hand, based on various considerations of place-attachments, architecture-nature interaction will be

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analyzed as its fundamental aspect. The main question therefore is: Is there any relationship between quality of place-attachment, experiencing and perception of nature in the built environment?

This article extends the psychological study of attachment to places by evaluating the nature-perception structure and performance of a commonly used place attachment approach designed to measure an important dimension of place attachment which is identified as perception and experiencing of nature in the built environment. In order to do this, first, place and place attachment will be briefly investigated, based on implications derived from major theories. Then the concept of perception in living spaces will be reviewed and the main framework of the study is made by defining the linkages between these concepts. Then, the assumed relationship will be examined by means of applying a survey in the residential areas of Hamedan. Finally the correlation of two major variables will be determined in order to evaluate the relationship between perception and experiencing of nature in the built environment and the quality of place attachment.

RESEARCH PROBLEM AND NECESSITY OF RESEARCH

Residential environment quality is one of the basic conditions for quality of life, as well as the main support for the activities of economy, culture and society.

The lack of nature-architecture interaction in contemporary built environments has caused many psychological problems including the lack of the sense of place and place attachment in residential environments. Thus the necessity of this research emerges at glance to contemporary life style.

At the other hand, although researchers have pursued various applications of place attachment and there are some researchers have shown emotional role of nature in place attachment process, but a few of them focused on the role of nature interaction as a critical variable which is in turn, includes plenty of factors. Besides, the place attachment is a critical issue that is required to be studies based on life style and lived space. Finally, given the differing forms of place attachment identified in the literature, questions still have remained about the criteria of architecture-nature interaction as a variable and their effects on place attachment. Based on the mentioned issues this research aims to present investigate the relationship between architecture-nature interaction and place attachment in residential environments.

PLACE AS A MULTI ASPECT ISSUE

Although “place” is a common sense term and different descriptions of a place seem to apply to a common object, place should nonetheless be viewed as an open and continuously changing system. According to Bott (Bott et al., 2003) place should be distinguished from “space” as it is implying an environment organized from the subject’s view point. There are some basic components of the concept of place and perceiving place. Based on definitions of theoretical framework, a place is a qualitative entity which cannot be reduced to any of its characteristics.

Canter (1977) describes place as the intersection of a setting’s physical characteristics, a person’s individual perceptions, and the actions or uses that occur in a particular location (cf. Bonnes and Secchiaroli 1995, 170-174; Bott et al., 2003). In figure1 a schematic model of place as the locus of forces affecting human actions is presented. Furthermore place has been described as the point where the setting’s physical and cultural characteristics melt with the individual’s affective perceptions and functional needs (Bott et al., 2003).

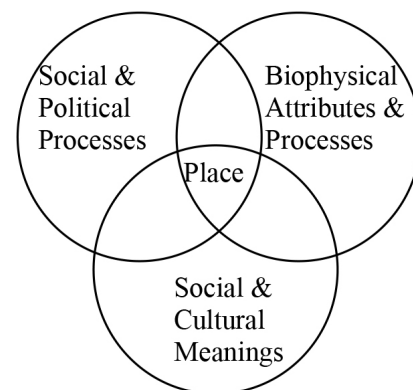


Fig. 1. Schematic of Place as the Locus of Forces Affecting Human Action. Based on Canter (1977), Relph (1976), and Sack (1992), (Cheng et al., 2003).

Other studies emphasize that places are more than geographic settings with definitive physical and textual characteristics; they are fluid, changeable, dynamic contexts of social interactions and memory (Stokowski, 2002, in: Kyle et al., 2004).

In this brief explanation of place, it is important to regard place in relation to people, their experiences and perceptions. There exists a basic concept by which the issue of “place” can be related to people. The concept is quality of place (QoP) which is a major aspect in the holistic framework of sustainability. Quality-of-place



is defined as an aggregate measure of the factors in the external environment that contribute to the quality-of-life, which in turn, defines the sense of well-being, fulfillment, and satisfaction on the part of residents or visitors of that place. According to this explanation, cultural amenities, crime, green spaces and congestion are a few of the factors determining the quality-of-place. Moreover sense of place is an important issue in relating to studies of built environments. In this paper it is explored as an aspect of environmental studies which is affected by users' perception in living spaces.

SENSE OF PLACE, PLACE ATTACHMENT

Human beings feel more vibrant in their spiritual moments. In such a case we feel connected to our environment and to the universe in a deep sense of belonging. "A place is not a place until people have been born in it, have grown up in it, lived in it, known it, died in it, as individuals, families, neighborhoods, and communities, over more than one generation. Some are born in their place, some find it, some realize after long searching that the place they left is the one they have been searching for. But whatever their relation to it, it is made a place only by slow accrual, like a coral reef"(Strenger, 1992, in Vitec & Jackson, 1996, p. 205). The deep sense of belonging makes people, as users of places, feel deep connections with lived spaces which can be named as a "sense of place".

"Sense of place" is a much used expression, chiefly by architects in theory but it is neglected in post occupied built environments especially in developing regions. Much of the works on the concept of place have taken an interdisciplinary approach and that is why theories on place frequently propose multiple factors working together. However it seems that an applicable framework based on environmental psychology could be more effective. In fact it would be effective to consider how the major components work together, rather than seeking and determining their causes.

The discipline of environmental psychology actually began in the faculties of architecture, as a natural investigation of how built environments were affecting people. Based on this discipline, connection to the place is deep and profound. In intensity and meaning, it goes far beyond what our direct physiological sensors are programmed to reveal (Masden 2005, in Kellert, 2005, p. 74). Following are some definitions and descriptions commonly used in the discipline of environmental psychology in order to make the concept of "sense of

place" more apparent. Place attachment, which has even been used as a synonym for sense of place, describes as the positive emotional bond that people have with a place (Soini et al., 2012). According to Hyden (1997), people make attachment to places that are critical to their well-being or distress. An individual's sense of place is both a biological response to the surrounding physical environment and a cultural creation as geographer Yi-Fu Tuan has argued (Hayden, 1997, p. 16). A place is a centre of meaning or field of care based on human experience, social relationships, emotions, and thoughts (Tuan, 1977). A three- component view of sense of place predominates: Places include the physical setting, human activities, and human social and psychological processes (Brandenburg & Carroll, 1995; Relph, 1976, 1997).

Place attachment is a bond between people and their environment (Moore & Graefe, 1994; Williams et al., 1992) based on cognition and affect (Low & Altman, 1992; Proshansky, Fabian, & Kaminoff, 1983 in: Stedman, 2002). A fairly well-known theory from the literature in environmental design research is David Canter's theory of place (Fig. 2).

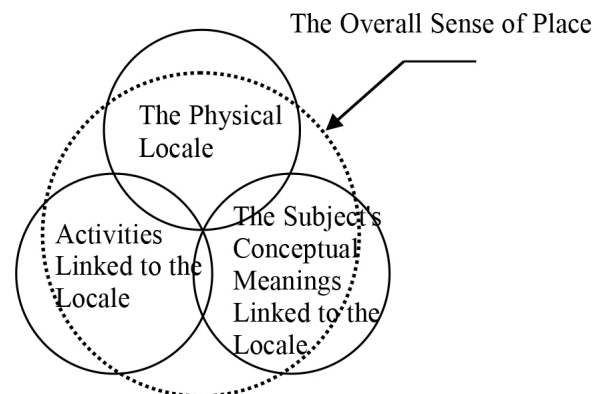


Fig. 2. A Diagram of the Factors in David Canter's Three-Fold "Sense of Place"(Groat & Wang, 2002, p. 77).

Canter posits that physical environments take on significance as a result of the interaction of three domains: the physical locale, the activity performed in that locale, and the meanings assigned to that union of place with activity. Together these are termed the "constituents of places"(Groat & Wang, 2002, p. 77). Environmental psychologists, Setha Low and Irwin Altman define "place attachment" as a psychological process similar to an infant's attachment to parental figures. They also suggest that place attachment can develop social, material, and ideological dimensions, as individuals develop ties to kin and community, own or rental land, and participate in



public life as residents of particular community (Hayden, 1997, p. 16).

Stedman (2002) has defined attachment to a place as satisfaction, or the attribution of utilitarian value to a setting, rather than salience based on identity. Moore and Graefe (1994) also have defined place dependence as valuing a particular setting for a certain activity (Bott et al., 2003). Considering the sense of place in relation to the religiosity and settlement size, Casakin and Billing (2009) referred to the sense of place as a multidimensional concept of cognitive and affective dimensions. In another study, components of the sense of place are considered as place attachment, place satisfaction and place identity (Jorgenson & Stedman, 2006), while in other studies, the concept of sense of place is assumed to be a place attachment.

These studies show that when a place serves as a resource for meeting or need or conducting an activity, people develop one sort of bond to it. Jackson defining sense of place believes that: "a sense of place, a sense of being at home in a town or city, grows as we become accustomed to it and learn to know its peculiarities. It is my own belief that a sense of place is something that we ourselves create in the course of time. It is the result of habit or custom" (Jackson, 1994).

Besides, many researchers have focused on place attachment based on aesthetic of place. At this stage, values, preferences, and goals that people incorporate in their experiences of a place is critical in creation of sense of place. Based on such these descriptions, it is believed that place attachment is a multi-aspect concept and various variables can be contributed to define this concept. This paper focuses on experiencing and perceiving of nature in the built environment which is a major component in built environment and assumed to have a critical role on place experience and thus place attachment.

Place Perception

People and world are intimately related in a way whereby each makes and reflects the other. People do not act on the world as subjects in relation to an object (as, for example, cognitive or structural approaches to environmental behavior would assume) but rather, are experiencing beings whose actions, behaviors, and understandings always presupposed and unfolded in a world that is, in turn, supported by and a reflection of these actions, behaviors, and understandings (Seamon, 1994).

There is a domain of expert knowledge where complex data about the environment have become so internalized that perception seems almost extrasensory (but is not). Experience represents a sensory response that has become

too complex for us to easily describe, categorize, or understand in an analytic manner (Salingaros & Masden, 2008).

Stokols and Altman (1987) determined that six factors contribute to aesthetic place perception: experience, knowledge, expectations, socio-cultural context, environmental elements, and physical context. Our perception is built to engage with features of place such as fine detail, contrast, symmetries, color and connections (Enquist & Arak 1994; Salingaros, 2003, 2006).

Creating an environment that deliberately eschews these elements (visual elements that especially are found in nature) has some consequences on habitants' sense of wellbeing and thus on attachment to the place. Gibson believes that certain perceptual aspects are derived from configurations of the whole, rather than additions of parts. On the other hand, place perception is dynamic because of the mental and physical activity of the human subject.

Although "place" is a common sense term and different descriptions of a place seem to apply to a common object, place should nonetheless be viewed as an open and continuously changing system. As most theories do, any practical application of the concept of place perception should assume an interaction between place and person (Bott et al., 2003).

People's experiences of place make a deep connection with each other, with living beings, and with nature. They experience a sense of wonder at the Creation (Wilson, 2008). Such connection is not measurable on a quantitative scale but its aspects can be evaluated and investigated. On this basis, a framework may be formulated in which, on the one hand, perception of place is regarded as a basis for investigating quality of place, and on the other hand, the focal point of assessing the sense of place is regarded as the quality of interactions between people and nature.

Experiencing Nature in the Built Environment as a Focal Point of Sense of Place

"People need contact with trees and plants and water. In some way, which is hard to express, people are able to be more whole in the presence of nature, to go deeper into themselves, to draw sustaining energy from the life of plants and trees and water. (Kaplan, 1983: Alexander, Ishikawa & Silverstein, 1977, p. 806)"

Hull and Vigo insist that sense of place is depended on place qualities. They offered the metaphor of place attachment as overlapping layers of opportunities, meanings and emotions related to setting, like a flower with overlapping petals (Bott et al., 2003).

Aesthetic qualities of a place and in the built environment need to be understood as inseparable from



those of the natural environment (Hayden, 1997, p.18). Following the arguments of Edward Wilson (1984), people are not capable of living a complete and healthy life detached from nature (Kellert et al., 2008, p. 63).

Ittelson (1973) used his theory of environmental perception to evaluate the influence of settings on individuals' well-being. There is good evidence for the "restorative" theory in that nature in the context of everyday life lessens stress and improves healing (Bott et al., 2003). The increasing documentation of the benefits of nature for human well-being supports the need for everyday access to nature. These effects are not only physical and mental but also spiritual and continuously make a deep attachment to place. The interaction between natural and built environment provides not only a spatial and physical interaction but also a socio-cultural interaction based on a multi- aspect perception of environment.

Based on the literature review the major aspects of experiencing nature were derived.

Applying Feldman's (1990) research findings to the natural environment leads to an interesting hypothesis. It could be that people have an attachment to a type of landscape, such as an oak savanna, as well as to a particular place, such as the stand of oak trees in their residential area (Kaplan & Kaplan, 1996).

The research believes that there is a great emotional sense in direct experiencing of nature, sometimes inspiring, sometimes bring memories to the minds and sometimes a great sense of humor. These senses could

be occurred in various situations. Another research conducted by Kellert believes in the relationship between a deep sense of belonging to home and direct experiencing natural elements such as view from home, gardening, water quality (Kellert et al., 2008).

According to the Kaplans (1996), who have looked at how people respond to a diversity of environments, "mystery is a factor of great power in predicting preference for scenes of the outdoor environment". This is a quality in life environment which is in direct relationship with existence of natural elements in places (Kaplan & Kaplan, 1996). According to basic theories of place perception, experiencing nature in the built environment can be categorized as direct experience of nature and Indirect experience of nature.

Table1 describes each aspect of direct experiencing nature in the built environment and explains components of each aspect. For each aspect, there exist important criteria which are explained. Furthermore in table2 indirect aspects of experience of nature are described.

Direct experience of nature is an aspect based on perception of physical features and events in relation to natural environment, such as visual elements, natural scenes and views from home, tactile experiences and so on which are explained in Table 1. In table 2 efforts are made to categorize aspects of indirect experience of nature in the built environment, such as mysterious experiences, symbolic meanings and richness of the memories. These are shaped by the interaction with natural environment.



Table 1. Aspects of Direct Experience of Nature

Direct Experience of Nature	Criteria/Related Aspects in the Environment
Direct Experience of Natural Processes such as: Changing Seasons, etc Visual Richness of Spaces	Possibility of Outside and Inside Interaction: Views from Home Experiencing outside from Home
Natural Elements in Architectural Spaces	Designed Areas for Gardening Designed Areas for Natural Elements: Water,.... Natural Elements in Interior Spaces
Affordance of Place: Semi- Open Spaces	Balcony, Bower, etc.
Affordance of Place: Views From Home	Having Natural Outlooks such as Mountains, Sky, Trees, etc.
Sociability of Spaces And Places	Possibility of Social Interactions in Relationship with Natural Environment in: Open Spaces Semi-Open Spaces Interior Spaces: Living Rooms, Kitchens, etc.
Quality of Natural Environment	Quality of Water Quality of Gardening
Quality of Natural Elements in Interior Spaces	Quality of Air And Natural Ventilation Quality of Natural Light in Architectural Spaces. Quality of Green Spaces
Quality of Physical Aspects of Environment	Natural Materials Applying Materials Based on Natural Essence

Table 2. Aspects of Indirect Experience of Nature

Indirect Experience of Nature	Criteria/Related Aspects in the Environment
Symbolic Meanings	Perceivable Symbolic Meaning in Built Environment in Related to Nature.
Sociability of Spaces And Places	Importance of Space Directions based on Natural Features Possibility of Social Interactions in Relation with Natural Environment: Living Rooms, Kitchens, etc
Memories in Related to Natural Elements of Space	Possibility of Association of Ideas and Memories in the Built Environment
Socio-Cultural Habitude for Attending in Natural Environments	Interested in Making Social Events and Interactions in Life Spaces Which are in Relationship with Natural Environments Norms and Social Values Encouraging Activities in Spaces Based on Experiencing Nature in Life Spaces
Mystery Based on Presence of Nature	



CASE STUDY: HOUSE-GARDENS IN HAMEDAN, IRAN: METHODOLOGY

Many researchers have suggested that evaluation of public perception could be significant in improving management and decision-making in the built environment. Schroeder's (2002) research extends this line of reasoning to suggest that evaluating place attachments have important implications for land and natural environment in face of increasing urban, suburban and developments in our environments (Bott et al., 2003).

As Moore (2006) has stated, from patterns we derive constructs that underlie the quality of life in the built environment. We are all and always surrounded by lawful physical mechanisms of which the vast majority of us are unaware, though we are affected by them every day of our lives (Moore, 2006).

In this research, based on the components of two aspects of experiencing nature in life spaces and their features in the built environment (Table 1 and Table 2), the framework of study was developed (Fig. 3).

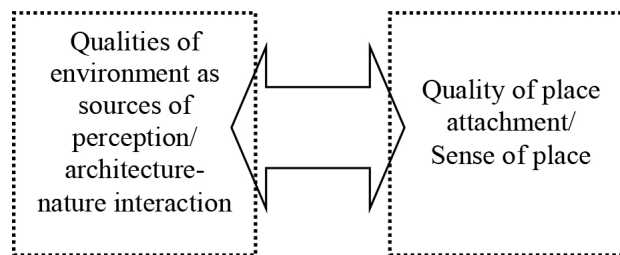


Fig. 3. Schematic Model of Framework of Assessment

Based on this framework, a written survey was used to ask participants about their attachment to the study sites, using both questionnaire and verbal measures.

Case Study Area

The study utilized a multiple methodology to investigate the effects of perceiving and experiencing nature in the built environment on the quality of place attachment. A case study is an empirical inquiry that "investigates a contemporary phenomenon within its real-life context, when the boundaries between phenomenon and context are not clearly evident, and in which multiple sources of evidence are used" (Yin, 1989).

The strengths of the case-study research are that they focus on the embeddedness of the case(s) in their real-life contexts. By the use of multiple data sources and types, they have the capacity to explain causal links and can generalize to a theory (Yin, 1989, 1994). Since naturalistic studies focus on smaller and purposefully selected samples that are thought to be information-rich for the purpose of study, the cases are selected on the basis of a pilot study.

Located on the western region of Iran, *Hamedan* is a mountainous and historical city in which there exist a great number of house-gardens specially located in the west of the city. These types of houses are located at the edge of the city, where many people have preferred these

places to live in. This area was chosen for investigating the human-nature interaction in the built environment which can affect the place attachment. Due to the importance of the length of residence in place of living as a determining factor in the quality of place attachment, it is considered as a control criterion, and, therefore, a minimum of 15 years residency was used as a criterion.

Survey Method and Data

The data were collected by means of a survey conducted on case studies, individually at the participant's homes. In other words, attending in each case, data collection and analysis performed thorough actual recording, surveying an analysis and deep interview through questionnaires

Correlation between place attachment and experience of nature were investigated through considering related indicators. In the first stage, the level of place attachment was measured by means of direct interviews and considering critical items including:

- Life satisfaction in the place
- Sense of belonging to place and affiliation
- How missing the place when leaving
- Sense of welfare in the place.
- Compatibility of activities and places
- Ability to control and monitor the place
- Safety in the place
- Privacy and satisfaction in the place



In order to evaluate each of these items, questionnaires were designed based on several sub-questions with ranking. The participants were asked to choose a ranking on a 5-point scale. In the second stage, nature perception and the residents' experiences were measured on the basis of the criteria mentioned in tables 1 and 2. Measures focused on participants' respective their life spaces.

At least one question was designed for each aspect of tables 1 and 2. Some questions dealt with the occupants' thoughts and feelings of their respective natural perceptions. It is obvious that the questionnaire cannot be explained completely but for instance, the questions in related to aspects of indirect experiencing of nature are as follow:

- How often you spend your times in natural environment of your house-garden?
- How much do you enjoy natural appearance and view of natural elements from home?
- Does the natural environment bring memories to your mind?
- How much do you enjoy the new wildflowers which have sprung up in your neighborhood?
- Do you have any favorite natural elements such as trees in your house-garden?
- How much do you miss your home due to the existence of natural elements?

Since place attachment becomes most apparent after negative changes occur in a place, another question was asked about their possible responses to some hypothetical, negative change to their living spaces. Some data were also gathered through direct observation, for which a 5-point Likert-type scale (ranging from 1 = not at all,

to 5 = very much) was used. Furthermore, participants were asked about their frequency and type of use of the spaces, their knowledge about nature in general, and their attitudes toward management of these areas. At last two sets of data were collected from 62 participants of 17 case studies for the next steps of evaluation.

RESULTS AND DISCUSSION

As the basic variables of research were qualitative, based on a hierarchical process, each variable was considered so that concluded sub-items. Each sub-item was measured in turn, by nominal quantities using a 5-point Likert-type. In other words for each item there existed some question answered by occupants which were considered as ordinal quantities dedicated based on replies of questionnaires (Field, 2007).

Table3 contains descriptive Statistics which describes data situation. Figure 4 is the scattergram of the research. Based on this graph, it seems that there exists a direct correlation between place attachment and experiencing and perceiving nature in the built environment. Figure 5 is a brief description of the two major variables' situation in each case study. This figure indicates that there exists a direct relationship between two major variables in each case.

The quantitative analysis in Table 4 verifies the assumed correlation between major variables of research--place attachment and perception of nature. As expected, calculation of correlation shows the existence of a significant positive correlation between the place attachment and nature perception($r=.605, n=62, p<.0005$). The score of correlation is meaningful and important.

Table 3. Descriptive Statistics and Data Situations

	N	Minimum	Maximum	Mean	Std. Deviation
Place Attachment	62	1.00	5.00	3.8909	0.98709
Perception Of Nature	62	1.00	5.00	3.9455	0.99162
Valid N (Listwise)	62				

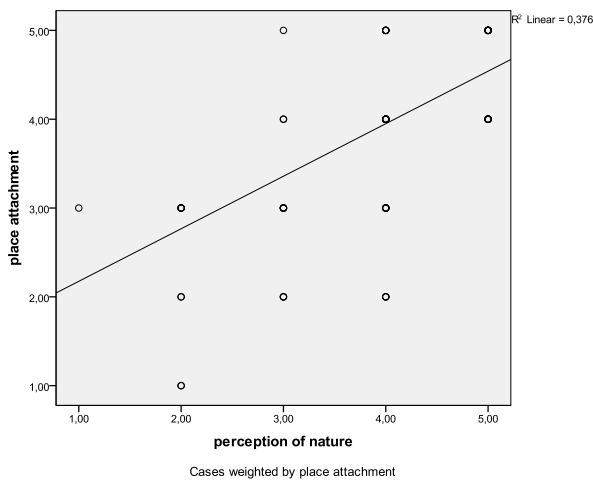


Fig. 4. Scattergram of Correlation between Two Basic Variables

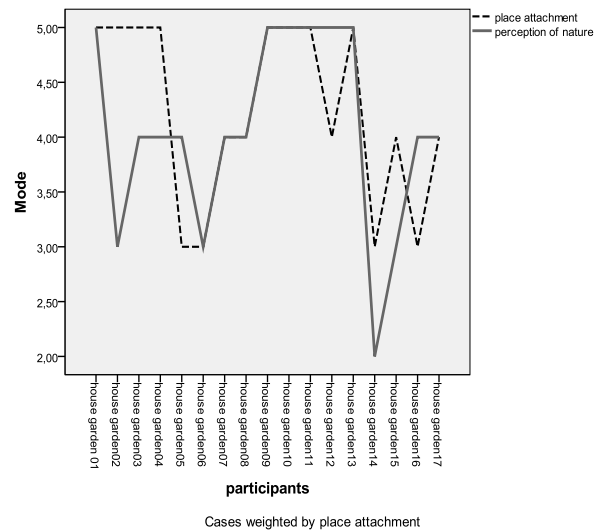


Fig. 5. Situation of Two Major Variables by Cases

Table 4. Descriptive Statistics and Data Situations

		Place Attachment	Perception of Nature
Spearman's Rho	Correlation Coefficient	1.000	0.605**
	Place Attachment Sig. (2-tailed)	.	0.000
	N	62	62
	Correlation Coefficient	0.605**	1.000
Perception of Nature	Sig. (2-tailed)	0.000	.
	N	62	62

** Correlation is Significant at the 0.01 Level (2-Tailed).

The objective of this test was to prove the research hypothesis. The proposed path proves presupposed correlation between basic variables. In addition to the quantitative analysis, qualitative interpretations were also derived from the survey. Observed behaviors of the occupants and their clarifications by interviews showed that physical qualities of living spaces have major roles in the perception of natural environment which in turn are key factors in making the sense of a place. More important, spatial organizations of spaces, prepare potentials for each affordance embedded of places. Images 1 to 6 describe the most important spatial qualities of places.

Images 1 and 2 indicate possibility of outside and inside interaction and refer to direct experience of natural processes such as: changing seasons, etc. Images 3 and 4 refer to the importance of sociability of spaces and places which are in direct relationship with nature, as another

specific spatial affordance in making sense of place.

Images 5 and 6, indicate the importance of applying natural materials based on ecological context. These qualities refer to physical aspects of built environment as major components of establishing the sense of place.



CONCLUSION

The aim of this paper was to see if there was any correlation between place attachment and experiencing nature in the built environment. The study used multiple measures of attachment to explore the factors that affect the emotional bond between people's places of life and natural perceptions. The research showed that attachment is a complex construct, influenced by the physical characteristics of the place itself, the type and intensity of people's experience with a place, and their knowledge about nature in general.

Through a qualitative method, the research revealed that affective dimensions of perceiving and experiencing nature are in direct relationship with quality of sense of place and place attachment. Moreover, this research explored the role of the spaces in relationship with nature as places for contemplation and self-discovery intended to establish spiritual linkages between people and their living spaces. The assumed correlation was further measured and verified through a quantitative study. In fact rethinking of the human relationship with nature-and thereby human identity-is rooted in place.

In this research, it is established a hierarchical multi-attribute system of aspects and criteria for considering nature and natural elements as an effectual system. In such case the residents would have deep place attachment and in turn it would result a healthy life style.

Based on the findings of this research which revealed the existence of a direct relationship between quality of place attachment and perception of nature in the built environment, it is recommended that in addition to including green spaces in the built-up areas, rooted norms, natural elements and contextual features of place should be also taken into considerations. Possible future developments could involve lay elements of the cultural context in making sense of place in the built environments.



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