

The Role of Open Spaces in Neighborhood Attachment

Case Study: Ekbatan Town in Tehran Metropolis

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ABSTRACT: This paper intends to highlight one of the key concerns of housing designers i.e. the influence of open space on human satisfaction as well as their attachment to a particular place. Consequently, neighborhood open spaces with their meaningful layout seem to be constituent elements of residential complexes. Although, architects and designers try to create qualitative areas among buildings, the function of open spaces has not fully been defined yet. As such, the current research aims not merely to elaborate on the role of open spaces, rather tries to propose designing criteria for residential complexes. Based on previous researches, the paper has investigated open space characteristics by taking into account Ekbatan residential complex in the west of Tehran metropolis, hence; proposed a model with effective variables. A survey was done after randomly selecting household samples there. Findings demonstrated the principal role of open spaces in the attachment to neighborhood. Security and quietness were the two other important criteria for those residents. Based on these findings, it can be said that the physical attributes play two roles in the neighborhood attachment; first, they facilitate social activities and provide opportunities to develop social attachment and second, enhance architectural attributes including aestheticism and density.

Keywords: *Open spaces, Residential complex, Neighborhood attachment, Architectural design*

INTRODUCTION

Designing qualitative residential environments has been one of the major challenges of architects and planners (Lang, 1987, 1994, 152; Einifar, 2008, 40-41). A brief glance on different experiences, in terms of neighborhood environment, shows great efforts and challenges of architects in creating meaningful residential areas (Einifar, 2008). As residential environment is an important concept of the present discussion, it seems peoples' attachment to their places of living play crucial role in creating social bonds. In environmental design, familiarity with different dimensions of this concept could lead to more qualitative areas.

On the other hand, increasing housing demands in the rapidly expanding urban areas, particularly in developing countries, accompanying with multi-faceted housing projects i.e. building blocks and outdoor spaces of various forms have led to new forms of residential complexes (Abu Gazzeh, 1999). In these complexes, buildings' layouts with different size, shape, and open space have meaningful relationships with each other (Azizi, 2008, 28). In other words, these open spaces not only

connect building blocks rather provide spaces needed to a residential complex. This seems to be a representative aspect of the problems faced by designers as it has consistently been found that when people are relatively dissatisfied with their estate, their dissatisfaction is often related to the external environmental factors (Department of the Environment, 1972a). Even those who seem to be satisfied with their houses, in real sense, they are less happy than the estate outside their dwellings (Beer, 1982; Abu Gazzeh, 1999).

When designers take into account the external environment of housing projects, they, quite often, concentrate on space standards (Department of the Environment, 1972b). Comparatively, the sociologically-based studies produce facts as how people use their housing areas and what they want from them (Mayer, 1962; Michaelson, 1970, 1976; Fischer, et al., 1977). However, the outcome of those studies appears to have little impact on the way a design decision is being made. There seems to be a communication gap between researchers and designers. Also, literature on public housing appears to deal inadequately with the external environment of housing areas (Cooper Marcus, 1982). Empirical research has shown

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that people value the estate outside their dwellings as part of home environment (Canter & Walker, 1980; Canter 1983, Abu Gazzeh, 1999). Thus, the present research specifically aims to find the role of neighborhood open spaces in creating place attachment as well as proposing design criteria for architects in creating more qualitative neighborhoods. The hypothesis i.e. neighborhood open space has a principal role in creating place attachment, has been tested by taking the Ekbatan township in Tehran metropolis as a case study.

Theoretical Framework

The concept of place attachment

Diversity of approaches and terms used in theoretical as well as empirical researches have been the main difficulties researchers encounter while dealing with the study on place attachment. In other words, researchers come across many similar notions and term in the course of their studies such as community attachment (Kasarda & Janowitz, 1974), sense of community (Sarason, 1974), place attachment (Gerson et al., 1977), place identity (Proshansky, et al., 1983), place dependence, sense of place (Hummon, 1992), etc. The concept of place is an issue that attracts researchers from a variety of reasons (Hernandez et al., 2007; Hidalgo & Hernandez, 2001; Gustafson, 2001; Ryan, 2005). Drawing on Relph and Canter's contrastive analysis, Gustafson (2001) developed a 3-dimensional; conceptual and theoretical framework including Person, Others and Environment as elements in creating meaning of the place. In other words, the place attachment (Fig 1) is a concept which is based on interaction and relationship between person, others and environment. This conceptual model has attracted many designers and ecological researchers (Kaplan, et al., 1998; Kaplan et al., 2008; Mazumdar, 2005; Mazumdar & Mazumdar, 2004). In order to investigate more, the place attachment has been reviewed from two perspectives: phenomenological (Carmona, 2006; Habibi, 2008; Partovi, 2002) and environmental psychology (Canter, 1977a; 1977b).

Place attachment and phenomenological

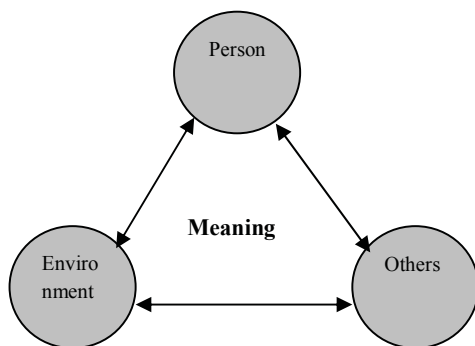


Fig. 1: The environmental meaning model
Reference:Gustafson:2001

approach

From phenomenological point of view, the place attachment is an emotional bond between person and a specific place which gets rooted in due course (Relph, 1976; Tuan, 1974). Relph, one of the leading phenomenologists, proposed three principal elements of place i.e. physical setting, activities, and Topophilia (Relph, 1976). He also emphasized on the essence of place as yet another principal element, and suggested places as “essentially centers of meaning constructed out of lived-experience” (Carmona, 2006, 97). According to him, imbuing places with meaning, individuals, groups and societies transform from spaces to places (Carmona, 2006, 97). In other words, the sense of belonging or attachment is a key to the concept of place. Tuan (1974) named this feeling as “Topophilia”, and called it the emotional bond between person and place.

The concept of place, often, emphasizes the sense of belonging or emotional attachment because people need to establish a relationship with specific places (Carmona, 2006, 97). Relph (1976) expressed this sense of belonging in physical setting as a dialect between inside and outside. To him, this concept could be achieved in designing physical separation or distinctness and a sense of entering into a particular area (Carmona, 2006, 97). Confined and legible spaces are the other factors which affect human perceptions.

Norberg-Schulz, a phenomenologist architect, investigated the role of design in creating existential spaces (Norberg-Schulz, 1980) hence; indicated following three elements in creating those spaces (Norberg-Schulz, 1985):

- Morphology: deals with the way of arrangement and inside and outside oneness,
- Topology: deals with spatial arrangement through designer's emphasis on order and environmental features. It also deals with adjacency, approach routes, centralism, etc.
- Typology: deals with conceptual and meaningful part of space and refers to residence or existence originating from the nature of human beings.

Place attachment and environmental psychology

'Place' is a rich psychological concept, which has been ignored almost completely in the psychological literature until 1970s. Canter (1974), an environmental psychologist, called the place as an experiential unity which refers to a specific physical setting and has three main components: activities, conceptual evaluations, and physical properties (Canter, 1986, 9). To him, place is the outcome of interaction between these three elements (Fig 2). Groat (1984) also pointed out that the concept outlined by Canter, may serve to integrate both the phenomenological and empirical approaches in environmental psychology.

It is believed that perception, cognition and affect are in fact the basic bio-psychological constituents of environmental meaning which has been conceptualized as either place preference (Porteous, 1996; Ryan, 2000), place symbolism (Rapoport,

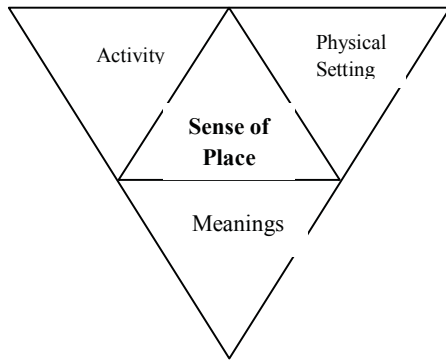


Fig. 2: Diagram of sense of place proposed by Punter and Montgomery Reference:Carmona,2006,99

1990), place knowledge (Lynch, 1981) or place attachment (Gustafson, 2001; Ryan, 2000). Both the place preference and the place knowledge are based on cognitive approaches whereas the place symbolism is based on cultural attachment to a place.

Based on Relph's and Canter's ideas, Punter (1991) and Montgomery (1998) located the components of sense of place within urban design thought (Carmona, 2006, 98; Fig 2). They included in the model people's imagination and concept instead of the meaning (Habibi, 2008, 44) and hence; suggested factors including environmental legibility, cultural interaction and perceptual function as principals in shaping the place attachment (Carmona, 2006, 99).

Constituent elements of place in neighborhood open spaces

In order to examine the proposed site design including the layout of the residential building in Ekbatan neighborhood in Tehran metropolis and the way it affects the social interaction among people, one particular aspect such as the built environment i.e. environment of the residential building or open spaces have been considered in detail. To this end, the constituent elements of open space in this neighborhood are considered based on the sense of place (Fig2).

Physical setting

Open spaces and their physical attributes have often been interesting subjects for researchers and designers (Bonaiuto et al., 1999, 2003, 2006; Abu Ghazze, 1999, 1996). Based on Norberg-Schulz's model, Table1 represents the physical setting in neighborhood open spaces. Consequently, four elements of physical setting are determined as: building architecture (BA) including aesthetic aspect, density and volume of buildings; extent of open space (EOS) including shape, form and arrangement of buildings; connection (C) including internal and external, and; green area (GA) including type of plants used. Other issues related to the above four elements are also indicated in Table 1.

Activities

Outdoor activities in residential areas are influenced by a number of factors---one of them being the physical environment that influences the activities to varying degrees and in different

Table 1: Architectural Elements of open spaces in neighborhood

Approaches	Open Space				
	Building Architecture	Extent of open spaces	Connections		Green Area
			Internal	External	
Morphology	-Building Density(Perceptual and quantitative) (Einifar,2000) - Building shape and volume - Building Height - Housing Layout(Abu-Ghazze,1999)	- Shape of open spaces -Extent of open spaces -Balance of Building and open spaces -Legibility of edges(Lynch,1981) -Confined spaces(Lynch,1981)	-path defining elements -Pedestrian way -Street way	-open space position in town -Town position in city -Street Way -Pedestrian Way	-Type of plants used -Color nad height of plans -Type of tress
Topology	-Building Geometry -Building Confining	-Open space's position in town	-Street's position in open space -Street's position with building		-Indicator Residential Plants
Typology	- symbol of residential blocks -Building Aesthetic	-Environmental silence -Open space Up-keep and care -Open space's security	-Street's up-keep -pedestrian and street distinctiveness -Silence		-Security in Green Area -Green symbol of residential area

Table 2: Activities in open spaces

Activity		Open space	
Necessary		-School services	-Commercial services -Health care services
Optional		-Sport services	-Cultural services -Religious services
Social	Personal motivation	-Social security and culture - social interaction	-Public meeting places -Assembling places
	Social similarity	-Social identity -Social Attachment	
	Time	-Length of residence	

ways (Abu Ghazze, 1999). Many researchers, planners and sociologists have attempted to study the activities in residential complexes (Krupat, 1980; Cooper Marcus, 1984; Lyon, 1987; Davis, 1991; Katz, 1994; Lawson, 2001, 2-3; Alexander, et al., 1977). According to Gehl (1980), outdoor activities in public spaces, can be divided into three categories of necessary activities, optional activities, and social activities each of which exerting different demand on the physical environment. Here, necessary activities refer to functional application, optional activities refer to recreational interaction and social ones refer to environmental interaction which has no determined specific space and is current in daily life of neighborhood; it is considered as a kind of passive contact in human-environment life. Over the past two decades, researchers have tried to investigate all types of activities, although, they have so far failed to determine the priority of activities in accordance with the neighborhood attachment. Table 2 shows diversity of activities in neighborhood with open spaces.

MATERIALS AND METHODS

Sample: Ekbatan Town

Ekbatan town is located on the western flank of Tehran metropolis, about 5km from Tehran-Karaj highway. The town consists of multiple-family housing (Figures 3, 4 & 5), which was built in 1050s by the Housing Corporation, a government entity, to the advantage of middle-income groups, especially Iran Air staff members. About 180000 people live in Ekbatan

neighborhood comprising about 15,500 housing units. The survey population of the proposed research has been PAHSE-2 of this town because of its open space extent as well as its massive population accounting up to 80,000 people. Further, in this phase, block 2 and 4 were selected because of higher concentration of inhabitants there (time factor) and they were mostly Iran Air staff members (social similarity). Time and social similarity are the two important conditions for researching neighborhood attachment (Kuper, 1953) and are often referred to as intervening variables (Abu Gazze, 1999).

Participants

Based on the research model (Fig 3), a questionnaire including all variables with a covering letter was prepared and distributed randomly among the population samples. Each given question consisted with four multiple choice answers ranging from totally agree to totally disagree. The interviews were carried out individually in the lobby of each block. On an average, each questionnaire took 10 minutes to be responded. So far as socio-demographic questions or personal attributes like age, sex, and number of people in a family and length of residence in the neighborhood - as intervening variables- are concerned, they were asked directly from the participants and mentioned on the top of the questionnaires. Table 3 shows the personal attribute’s mean in survey population.

Neighborhood attachment in Ekbatan town



Fig.3,4 &5: Multy-family Housing in Ekbatan

A descriptive data analysis shows residents' higher attachment to their living environment (Table 4) as well as their satisfaction with neighborhood. The low rate of social identity is related to the diversity of residents settled there. Among residential variables, there is a significant direct relation between length of residence and neighborhood attachment (Table 5) hence, the

neighborhood attachment tends to increase with an increase in the length of residence. Other socio-demographic variables including-- age, sex, number of people in a family-- had no significant direct relation with the attachment. Results show that those who are satisfied with their position in the neighborhood

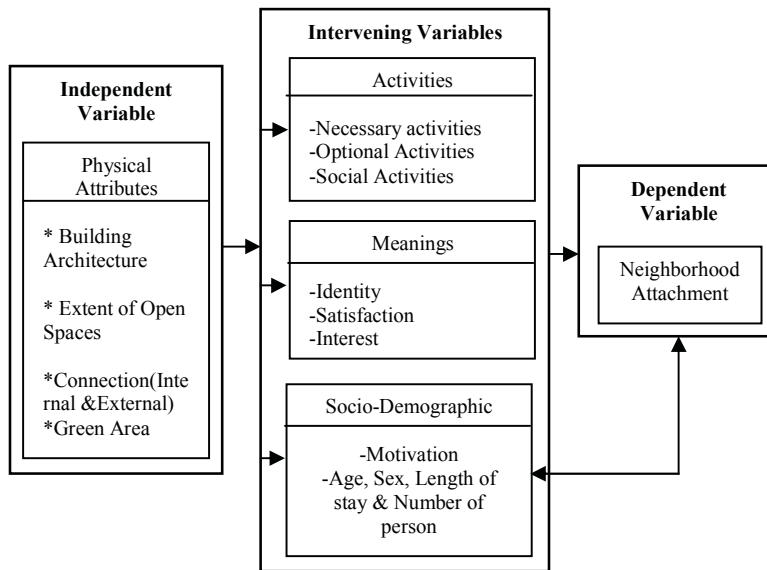


Fig 6: Research Model based on variables

Table 3: Participants personal attributes mean

Variables	Mean
Age	33 years old
Sex	56/7% male- 43/3% female
Length of residence	11/8 year
Number of person	3/75 person

Table 4: Descriptive results of resident's neighborhood meanings (max=4, min=1)

Ekbatan Neighborhood attachment	
Neighborhood Interest	3/27
Neighborhood Satisfaction	3/09
Social Identity	2/54
Neighborhood Attachment	3/1

Table 5: Relationship between personal attributes and neighborhood meanings

Personal Attributes	Age	Sex	Length of residence	Number of person
Neighborhood Interest	P=0/085 s=0/203	P=0/008 s=0/906	P=0/194** s=0/004	P=0/018 s=0/787
Neighborhood Satisfaction	P=0/153** s=0/022	P=0/051 s=0/450	P=0/187** s=0/450	P=0/012 s=0/860
Neighborhood Attachment	P=0/066 s=0/325	P=0/009 s=0/890	P=0/229** s=0/001	P=0/055 s=0/409

have a sense of belonging to the open space, as well. This has also been indicated in previous researches on open spaces (Abu Ghazze, 1999; Department of the environment, 1972b; Beer, 1982). It means that persons who express their attachment to residential environment, also, expressed their attachment to their open spaces. The Spearman coefficient analysis also proves that the open space plays an essential role in creating neighborhood attachment (RS = 51.1%)

Constituent elements of place in neighborhood open spaces

Drawing on a model proposed by Punter and Montgomery (Fig 1), the analysis of results show a meaningful relationship between three elements of open spaces, namely, physical setting, activities and meaning (Table 6). These results are also in line with Relph's and Canter's notion on place elements and the importance of meaning in place. Among the given three elements, the meaning of open spaces found to be very important in creating place conception, which on the other hand also emphasizes on Relph's idea that places are essentially centers of meaning constructed out of lived-experience (Carmona, 2006, 97). The importance of meaning, as evident in the current findings, shows that neighborhood open spaces,

from point of view of residents, should be imbued with senses of quietness and security. In other words, quietness and security in neighborhood open spaces are the most powerful indicators of residential environment. Results show that these meanings could be achieved through architectural attributes. Analyses show that the ability to see the area and open spaces from within the residential blocks and illuminating open spaces at night are the main factors in creating a sense of security. About the quietness, keeping people away from crowding in the neighborhood or on green spaces are important factors in eliminating noise.

Also, there are significant relationships between architectural attributes and activities. Table 6 shows the correlation coefficient between the above three elements of neighborhood open spaces. It shows that activities are the most effective factor in creating meaning. This finding also emphasizes Canter's notion about the importance of activities in place (Canter, 1986), which too has been proved by other researchers (Sime, 1995; Abu Gazzeh, 1999).

Table 7 shows the correlation between activities, architectural attributes and environmental meanings- including interest, satisfaction, social identity and neighborhood attachment. The results highlight the role of architectural attributes and

Table 6: Relationship between open place's constituent elements

Place Constituent's elements	Architectural attributes	Activities	Meanings
Architectural attributes	-	S=0/528** s=0/000	S=0/577** s=0/000
Activities	S=0/528** s=0/000	-	S=0/662** s=0/000
Meanings	S=0/577** s=0/000	S=0/662** s=0/000	-

Table7: Relationship between neighborhood meanings and open spaces' elements

Environmental Meanings	Place elements	Activities	Meanings
Neighborhood Interest		S=0/48 s=0/000	S=0/444 s=0/000
Neighborhood Satisfaction		S=0/552 s=0/000	S=0/519 s=0/000
Social Identity		S=0/381 s=0/000	S=0/281 s=0/000
Neighborhood Attachment		S=0/57 s=0/000	S=0/520 s=0/000

Table 8: Relationship between Architectural attributes and neighborhood meanings

Meanings	Architectural Attributes in Neighborhood Open spaces			
	Building Architecture	Extent of Open Spaces	Connection	Green Area
Neighborhood Interest	S=0/5** s=0/00	S=0/431** s=0/00	S=0/299** s=0/00	S=0/201* s=0/003
Neighborhood Satisfaction	S=0/554** s=0/00	S=0/435** s=0/00	S=0/357** s=0/00	S=0/254** s=0/00
Social Identity	S=0/393** s=0/00	S=0/268** s=0/00	S=0/136* s=0/041	S=0/155* s=0/020
Neighborhood Attachment	S=0/584** s=0/00	S=0/473** s=0/00	S=0/341** s=0/00	S=0/243** s=0/00

activities in creating neighborhood attachment.

Architectural design and neighborhood attachment

Table 8 indicates relationships between architectural variables (BA, EOS, C, GA), and environmental meanings in neighborhood open spaces. It is observed that all architectural variables have significant relationships with neighborhood attachment. Among architectural variables, building architecture (BA) with its density, volume and beauty and extent of open space (EOS) with shape, form and arrangement of building have the highest correlation coefficient with neighborhood attachment. From the point of residents, too, the variables like building architecture (especially with its aesthetic aspect) and the extent of open space (including its confined spaces and distinct areas) play the most effective roles in creating the attachment.

The above discussion emphasizes on the necessity of considering residents' views on building architecture (BA). Researches, however, show differences between residents' aesthetic criteria with that of designers' (Gifoord, 2002). Thus, it can be said that knowing residents' aesthetic points with regard to form, color, shape, scale and extent of buildings could be useful in designing open spaces in neighborhoods.

Contrarily, extent of open space (EOS) represents the second priority among the effective variables. As shown in Table 8, there is also a significant correlation between environmental meanings and EOS. The analysis of this variable shows that residents tend to live in places that are easily perceptible. At the same time, they prefer the confined and legible open spaces which give them a sense of belonging and the authority of controlling these places. The results of proposed study show that residents have developed a sense of belonging to private and semi-private open spaces available in their residential complexes. Consequently, creating more private and semi-private open spaces in each block with confined and legible corridor will be a good way to develop the neighborhood

attachment.

With regard to the third architectural variable i.e. connection (C), the results found a significant correlation between this variable and attachment (Table 8). Considering internal and external connections, the results accord more importance to the internal connection. Simplicity of connection to the neighborhood was the most important issues for residents. Security of internal roads was the issue that showed a highly significant correlation with the neighborhood attachment.

Yet another variable i.e. green area (GA) although a significant but had lower correlation with attachment. It was found that green areas could influence neighborhood attachment by creating more private spaces.

CONCLUSION

The relationship between people and environment is the result of complex interactions among cultural, environmental (physical) and perceptual variables. Physical features of a housing site often influence the people's feelings toward the surrounding area. The results of the current study also show the principal role of neighborhood open spaces in creating a sense of belonging. Residents who were satisfied and attached to open spaces also expressed their attachment to their neighborhood. By this way, designing open spaces with their architectural attributes, obviously affect the neighborhood attachment.

Drawing on model proposed by Punter (1991) and Montgomery (1998), results show the importance of meaning in neighborhood open spaces compare with other place constituents (activity and physical setting). This means that people prefer secure and safe open spaces at residential complexes hence; architectural attributes found to play essential role in this regard. Based on the findings, for residents, the ability to see open spaces from within the residential blocks and illuminating the area at night and using green areas found to be important factors for creating attachment to their neighborhood.

Results, also, showed that activities have more effective role in creating neighborhood attachment compare to architectural

attributes. What makes a space as a place for a person is its mixing with activities.

Among socio-demographic and residential variables such as age, sex, length of residence and number family members, the most powerful predictor of the attachment was the length of residence. It showed that neighborhood attachment tends to increase with the increasing length of residence.

Regardless of general criteria in planning of residential complexes, findings of the current research demonstrate two functions for neighborhood open spaces, with respect to creating attachment.

1. Physical role: From this perspective, building architecture (including aesthetic, density and volume aspects) and the extent of open spaces play important role in creating neighborhood attachment. In this regard, considering residents' aesthetic criteria is vital in designing building blocks. In other words, designers should take user's aesthetical inclinations into account. This issue is emphasized specially in public places like neighborhood open spaces.

Among architectural variables, the volume and density of buildings, in comparison with their aesthetic aspect, have little relationship with neighborhood attachment. The extent of open spaces, by considering its distinctiveness from surrounding area, is yet another important factor. Legible open spaces including legible buildings are the next predictor of attachment. Confined and distinct areas in open spaces, with residents' outright control over them, make it easier for them to socialize and develop social attachment.

2. Facilitating activities: Open spaces facilitate the fulfillment of inhabitants' needs including physical and social ones. Findings demonstrate that social activities are more effective in creating neighborhood attachment. This means peoples' activities in open spaces increase the possibility of social contacts--in other words called the passive contact, which gives a person an opportunity to establish social bond.

The value of diversity in activities in the layout of open spaces lies in its potential in providing people with experiences. Such diverse activities create numerous opportunities for people to interact with other lots. Despite the possibility of conflict, this phenomenon tends to empathy and understanding. The spatial and visual patterns of spaces can be designed between residential buildings to enable and encourage residents to behave in ways which enhance the perceived quality of neighborhood. By the same token, the physical environment can facilitate the occurrence of activities and events that support and enhance the well-being of residents. Another role of physical design, as mentioned before, is creating confined and distinct areas. The extension of opportunities for outdoor stays where everyday activities take place is expected to make a valuable contribution to residents' satisfaction.

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