



Evaluation technique of perceptual qualities of an urban corridor Noghhan Bazaar, Mashhad

M. Abbaszadegan^{1*}, H. Ghahremani², E. Mojtahed Sistani³

Received: November 2013, Revised: June 2014, Accepted: July 2014

Abstract

It is claimed that perception is the result of objective measurement and subjective reaction, when people immerse in an environment. This statement is the main theme of this paper. This study tries to set a framework in analyzing built environment that is to comply with human perceptive processes. The approach of this article presents a methodology to assess the perceptual environment. The paper initially reviews the literatures that deal with perception theory and perceptual procedures. As a case study, a part of historic Noghhan Bazaar in Mashhad has been examined to understand how people's perception and behavior can be directly influenced by landscape features. To explore this relationship a research technique has been employed that employs perceptual assessment survey by experts. Some measures introduced in this paper are useful to understand how environmental qualities, as well as patterns and combinations of particular qualities, affect people's perceptions of landscape. The outcomes would be the identification of a connection between the designed, physical aspects and the subjective sense of environment. The result of this study could be employed as a research technique to analyze the built environment in order to recommend design solutions, especially for valuable old heritage fabrics of cities that encompass common memorable spaces and convey common social values.

Keywords: Environmental perception, Formal (objective) features, Evaluation criteria, Historic 'Noghhan' bazaar.

1. Introduction

From the early 1960s onwards, environmental perception has been part of an interdisciplinary discussion. The relationship between human and their environment-how they perceive space and how they react to it, has always been a very complex matter. Environmental perception is the process of receiving sensual information and making sense of the surrounding world. It involves the decision process of what information to notice, how to categorize information and how to interpret sensory impressions in order to give meaning to the environment within the framework of existing knowledge.

Furthermore, as responses and reactions to the environmental information emerge, human spatial behavior in the environment is changed caused by the human motivation to fulfill the necessities of life [1].

The perception of one's environment is affected by sociological needs, psychological states and individual differences. People interpret what they see on the basis of their interests, background, experience, and attitudes. The environment itself also has an influence on human behavior.

One of the major challenges in analyzing landscape is the lack of perceptual aspects disregarded by most users while totally immersed in the environment, which can lead to an unintended comprehension of it and wrong behavior in the environment. Identifying and defining those qualities and features that have affected the perception of a landscape helps individuals to collect, select and organize stimuli as well as behavior patterns. Hence, the objective of this paper is to study and measure perceptual qualities of landscape sceneries and to identify detailed physical features associated with.

In this study part of traditional and historical bazaar of Noghhan that located next to a historical building called break dome (Gonbad Kheshti) which is the tomb of one of Islamic saint have been studied and analyzed. This core contains historical, cultural and religious values that in process of renovation of the central fabric of Mashhad most of its values have been ignored and demolished.

* Corresponding author: mostafa.abbaszadegan@gmail.com

¹ Associate Professor, Department of Architecture and Urban Planning, Iran University Science and Technology, Narmak, Tehran, Iran

² PhD Candidate in Urban Planning & Design, Department of Architecture and Urban Planning, Iran University Science and Technology, Narmak, Tehran, Iran

Instructor in Urban Design, Department of Architecture and Urban Planning, Ferdowsi University of Mashhad, Mashhad, Iran

³ Master student in Landscape Architecture, Anhalt University of Applied Sciences, Germany

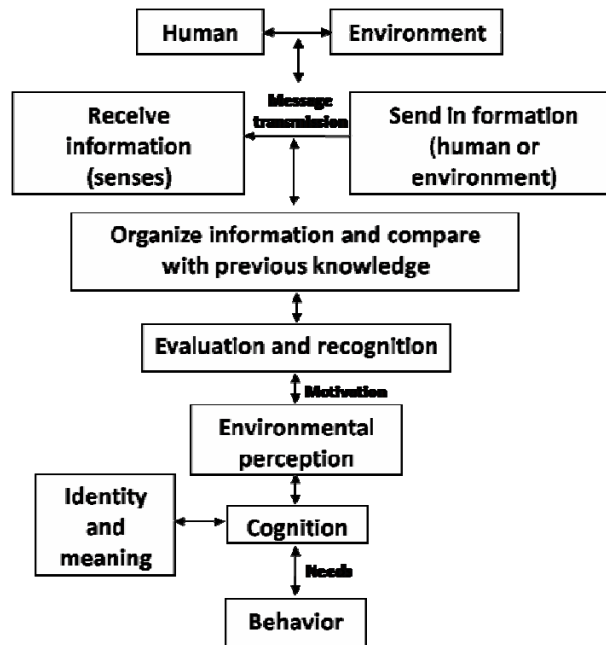


Fig. 1 perceptual process; by Authors

2. Research Method

The conceptual model underlying this study considers the role of perception as it intervenes with the physical features and subjective qualities of the environment.

The paper initially discusses the theoretical process of perception; it defines aspects that affect this process. It is moreover claimed that perception is the result of objective measurement and subjective reaction to it when people are confronted with an environment.

To examine the proposed assessment process that suggested in this paper an exploratory study was conducted. A part of historical bazaar as the case study has scrutinized through perceptual assessment survey by expert approach.

Based on a formal aesthetic analysis in a pair of field experiments skilled and trained observers were asked to walk through consecutive spatial sequences of bazaar. They responded which landscape qualities influence on their perception of the environment, and which formal features cause these subjective senses by having positive or negative impressions on their reactions.

3. Theoretical Precedence of Perception

Perception is interrelated to a mental concept and its impact on human's life. Transactional theory as defined by Itelson (1996) explains that, perception determined by a process of experience and dynamic relationship between human and his environment.

Another perceptual theory proposed by Nieser (1970) stress that perception constitutes a process based on experience, learning and memory that involves a cognitive process. Perception consists of information processed inference and construction of meaning of the present and

the past stimuli. It is very important to understand it because the environment provides information and messages that must be perceived actively by humans and they need to have experience to understand and recognize their environment [2].

The gestalt is a psychology term which means "unified whole". It refers to theories of visual perception developed by German psychologists in the 1920s. These theories attempt to describe how people tend to organize visual elements into groups or unified wholes when certain principles are applied. The objective of studying gestalt is having the designer be in control of what the viewers see when they look at a composition according to the current time and place without any regards to the past.

The array of information in our sensory receptors, including sensory context based on movements in spaces, is all we need to perceive anything in Gibson approach. We view the world in terms of what various parts afford us in a utilitarian sense. We do not need higher cognitive processes or anything else to mediate between our sensory experiences and our perceptions. The design process has traditionally viewed the landscape as a static scene from fixed viewpoints, comprising the spatial relationship of several parts to the whole [3].

4. Perceptual Process

The environment is full of stimuli that have the potential to be perceived and can attract our attention through various senses. Responses to the environmental stimulus are complex and best understood in terms of three psychological stages of human behavior: perception, cognition and spatial behavior.

Perception of the environment, in its most strict sense, refers to the process of becoming aware of a space by acquisition of information through the sensations of sight,

hearing, smell, touch, and taste. Cognition is the mental processing of this sensory information. This may involve the activities of thinking about, remembering or evaluating the information. Spatial behavior refers to responses and reactions to the environmental information acquired through perception and cognition. The designer creates environmental stimuli to direct these psychological stages as well as the secondary processes of motivation, effectiveness and development [4].

An important aspect highlighted in this context is that human aesthetic experience is actually very interrelated to its environmental perception. Environmental perception is a process to comprehend the physical environment through a sense input from stimuli that have just happened or existed. Various physical environment stimuli that spread are organized by processing perception to become a complete and arranged environmental description. The theoretical framework of environmental perception constitutes a basic approach to reveal how a psychological factor has a role in space design. Physical limits in the built environment refer to the result of architectural design whereas human's perceptions towards the stimuli of the built environment refer to processes of psychological relationship between humans and their environment [1].

5. Factors Influencing Perception

The main deductions, which can be concluded from the A number of factors shape and sometimes distort perception. These factors can reside: in the perceiver, in the object or target being perceived or in the context of the situation in which the perception is made [4].

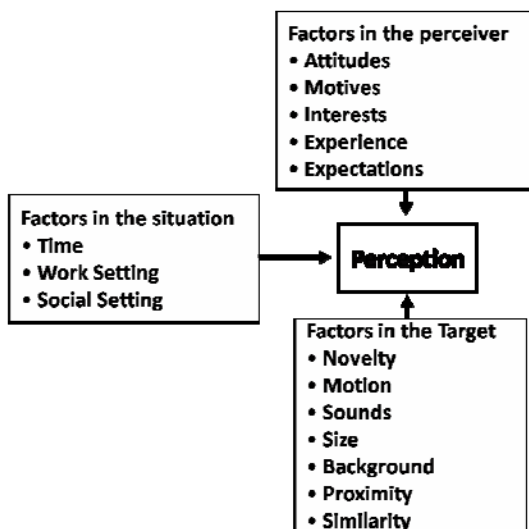


Fig. 2 Factors influencing perception; by Authors

6. Evaluating Environmental Perception

Within landscape perception studies, there are said to be four main paradigms [5], following a model of landscape perception based upon human–landscape interaction to evaluate landscape. These paradigms are: expert, psychophysical, cognitive and experiential. The

expert paradigm has also been called formal aesthetics [6] and it involves the evaluation of landscape quality by skilled and trained observers.

The psychophysical paradigm involves assessment through testing general public or selected populations' evaluation of landscape aesthetic qualities or of specific landscape properties [5]. Studies within this paradigm attempt to combine cognitive research on the subject (i.e. the viewer) with the object (the physical landscape) and customarily claim that quality is related to both the landscape and the observer, which is consistent with landscape theory [7].

The cognitive paradigm involves a search for human meaning associated with landscapes or landscape properties. Cognitive landscape studies have generally been found in the mental process of perceiving, seeking to understand predispositions or interventions in human evaluative processes as well as meaning [5].

Research that can be subsumed under the experiential paradigm considers landscape values to be based on the experience of human–landscape interaction, where by both are shaping and being shaped in an interactive process [8].

Measures of evaluating landscape are both objective and subjective and can be collected by members of a research team or by interviewing residents or employees.

A number of environmental audit methodologies have emerged to collect these micro scale data. The unit of analysis for these audits is the urban block face, the street segment or intersection [9].

7. Subjective Features

This study considers expert paradigm by recognizing a connection between objective and subjective measures. A long list of landscape qualities have been introduced in related the literatures. This study looked for features that were most frequently discussed and empirical evidence showed their physical features are more recognizable for its interviewees (A panel of 10 urban planning and design students). This effort led to the selection of eight subjective features: Imageability, Legibility, Enclosure, human Scale, Transparency, Linkage, Complexity, and Coherence. We need an operational definition that helps interviewees to respond to the questions explicitly.

Imageability:

Qualities of a landscape present in totality or through elements, landmarks and special features, both natural and cultural, making the landscape create a strong visual image in the observer [12].

Legibility:

Legibility refers to the ease with which the spatial structure of a place can be understood and navigated as a whole [11].

Enclosure:

Enclosure refers to the degree to which streets and other public spaces are visually defined by buildings and other elements [11].

Human Scale:

Scale is affected by line-of-sight and viewable area and is related to the grain size or degree of openness in the

landscape [12]. Human scale refers to size, texture and articulation of physical elements that match the size and proportions of humans and correspond to the speed at which humans walk [11].

Transparency:

Transparency refers to the degree to which people can see or perceive what lies beyond the edge of a street or other public spaces and, more specifically, the degree to which people can see or perceive the human activity beyond the edge [11].

Linkage:

The linkage refers to physical and visual connections from building to street, building to building, space to space or one side of the street to the other which tend to unify dispersed elements [11].

Complexity:

Complexity refers to the visual richness of a place. The complexity of a place depends on the variety of the physical environment [11]. Complexity divides into types, with or without order. Complexity with order provides visual richness to a scene, while disordered complexity can be considered as a chaotic component [14].

Coherence:

Coherence refers to a sense of visual order [11]. This term shows the degree to which all visual elements combine to form a coherent, harmonious pattern. The concept of coherence or unity is developed and used both within the professional approach to landscape assessment [12] and within environmental psychology [14].

Table 1 Subjective measures are shaped by objective qualities, by authors based on literature review

Landscape quality (subjective)	Physical features (objective)
Imageability	<ul style="list-style-type: none"> • Memorable and recognizable forms or functions • spectacular elements, panorama, landmarks, water, iconic elements
Legibility	<ul style="list-style-type: none"> • Physical elements that serve as reference points • Pedestrian network that provides a sense of orientation
Enclosure	<ul style="list-style-type: none"> • Vegetation • Continuity of edges • The ratio of height of building to width of street • Color, texture and form of materials(facade and pavement)
Human Scale	<ul style="list-style-type: none"> • The height of building • The ratio of height to width 2-1, 1-1 or 1-2 for static spaces • Building details • Pavement texture • Street trees and street furniture
Transparency	<ul style="list-style-type: none"> • Walls • Windows • Doors • Fences • Landscaping • Opening into midblock spaces
Linkage	<ul style="list-style-type: none"> • Tree Lines • Building projections • Marked crossing
Complexity	<ul style="list-style-type: none"> • Diversity, variation, complexity of patterns and shapes • Numbers and kinds of buildings • Architectural diversity • Architectural ornamentation • Landscape elements • Street furniture • Signage
Coherence	<ul style="list-style-type: none"> • Consistency and complimentarily in the scale, character , and arrangement of buildings • Street furniture • Pavement materials

8. Case Study (Historical Bazaar, Iran-Mashhad)

City of Mashhad is one of the most prominent religious Islamic cities that located in the north east of Iran. The

Shrine of Imam Reza is the focal religious heart of the city that most of the traditional structure of the city has been shaped with much emphasis on the Shrine. Various elements of the structure of the city can be identified in the center of the city such as the historical Bazaars of the city. One of the Bazaars is Noghhan Bazaar. Noghhan Bazaar has

a dominant distinctive role in the common memory of residents.

In the existing situation, because of the vast renovation plan of the central district of the city, the Bazaar lost some of its credential role in the structure of the city.

Both administrative bodies of the city and urban planner and designer professionals believe that the bazaar should be revitalized. Various approaches have been considered to

prepare the revitalization plan for the Bazaar.

This study's aim is to utilize an environmental psychology method, considering perception process to be able to evaluate current revitalization plan and suggest a revision.

In a pair of field experiments a relationship between the physical features of environment and landscape qualities was discovered.

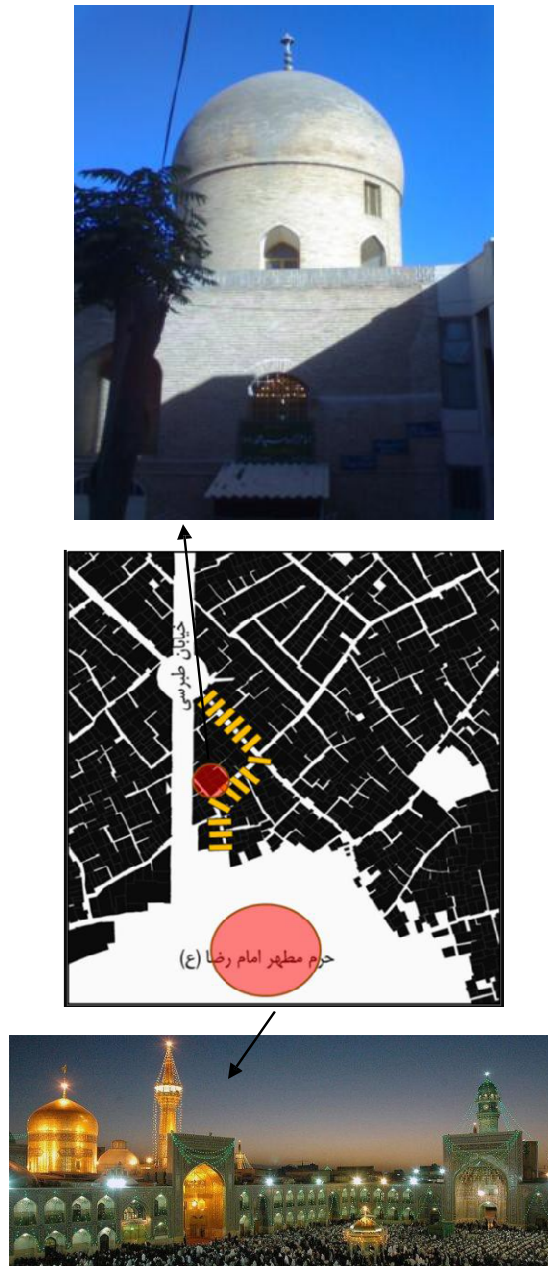


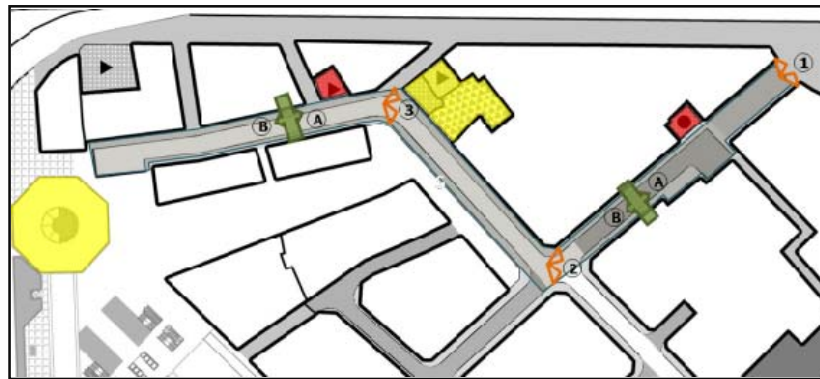
Fig. 3 The location of Noghjan Bazaar, Shrine of Imam Reza and KHeshti dome; by Authors

9. Analysis of Bazaar (Analyzing the Relationship Between Physical Features and Cognitive Qualities)

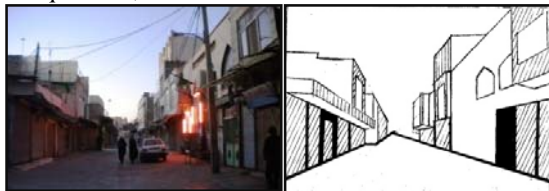
In this research, Noghjan Bazaar is divided to several sequences and which each is subdivided again. A group of 10 last year students of bachelors of urban planning have been selected to participate in the study. First, definition and concepts of the cognitive qualities (subjective

qualities) was explained to them. Then, they were asked to take a field trip to Bazaar and record the important physical features of each of its sequences. Then, the results of the visit were used for a content analysis. Based on this analysis, major physical features of each sequence have been extracted from sequential views. Existence of various extensions and additions to buildings created many complex lines on floors and sides views, which were simplified based on Gestalt principles. These simplified pictures of the spaces delivered to the interviews, considering their visit and have asked them to consider each physical feature of sequences and evaluate them

using a 4 point scale to determine how strengthening or weakening the physical features are for the eight qualities of the landscape. Based on principles of Delphi Technique [16] if over %70 have rated the sequences 3 or more, it shows that they have a consensus on the matter. In other words it shows that there is a strengthening effect present in that sequence. In the resulting table, the strengthening effects are presented with a + sign and weakening effects with a – sign. In case of lack of consensus, indifference is concluded. Using this technique would allow us to find the strengthening and weakening physical features.



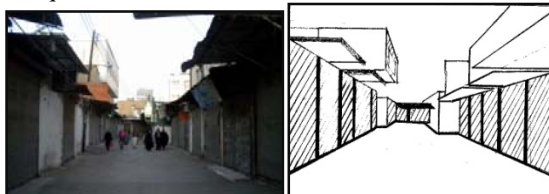
- Sequence 1, section A



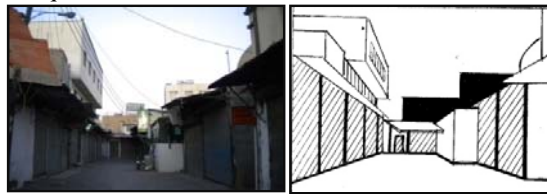
- Sequence 1, section B



- Sequence 2, section A



- Sequence 2, section B



- Sequence 3, section A

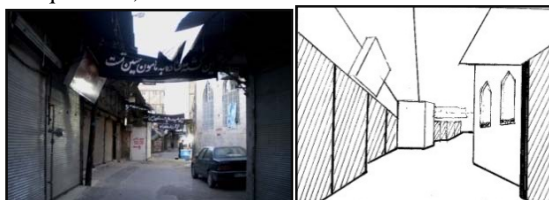


Fig. 4 Perceptual Analysis according to Gestalt theory; by Authors

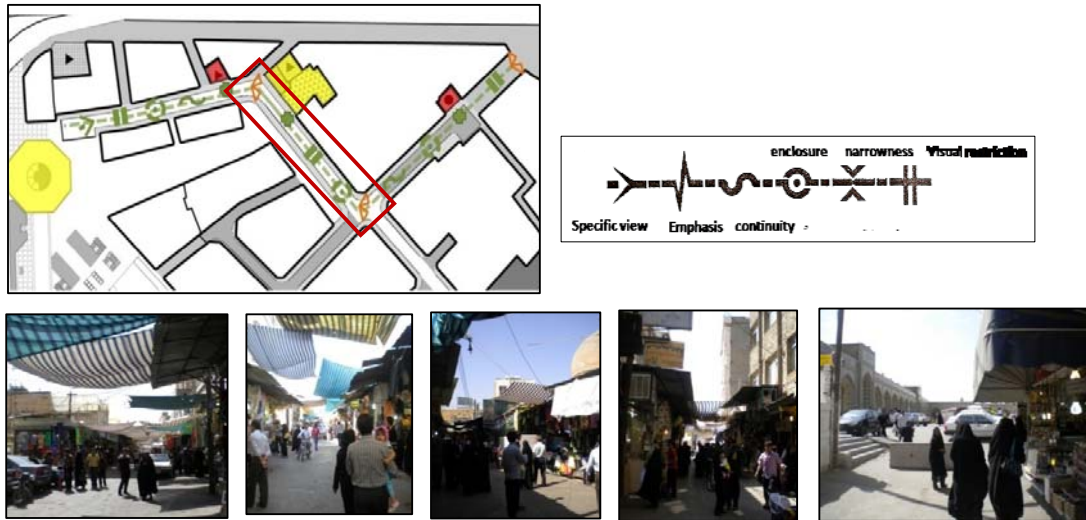


Fig. 5 Landscape qualities effect on perception ; by Authors based on Michael Trieb point of view[15].

Table 2 Matrix of hypothesized relationships; by Authors based on experts analysis

landscape qualities (subjective)								Physical features (objective)
Objective measurements have a positive impression on subjective qualities(+)								In sequence 2
Objective measurements have a negative impression on subjective qualities(-)								
Imageability	Legibility	Enclosure	Human Scale	Transparency	Linkage	Complexity	Coherence	
						+	+	Curve in the ground line leads to visual mobility
					+		+	Continuity by vertical rhythm along the street
-		-	-				-	Uncoordinated skyline
					+	+		Visual mobility with smooth curved
		+			+		+	Transforming line to surface to create stagnation
-		-						Inconsistent context and background with Gonbad (dome)
+						-	-	Disruptive rhythm and sequence in front of Gonbad
						+		Contrast in facade
							-	Lack of variety in enclosure
-	-							Inability to see and experience Gonbad in serial visions
		-	-	+			-	Lack of vegetation
+	+						+	Gonbad as a distinct joint of Bazaar
+			+				+	High density of people near Gonbad
-	-		-		+			Lack of harmony in color, texture and material
		+	+				+	Scale 1-1
			-					Interfusion of pedestrian and vehicle
		+	+	-	+		+	Canopies
	+				+	-	+	Similar activities



Fig. 6 Landscape qualities effect on perception in redesigning sequence 2; by Authors based on Michael Trieb point of view [15]

10. Conclusions

This study has demonstrated a framework in analyzing environment according to the perception process and upon the criteria of formal evaluation.

It has illustrated that qualitative landscape features can be quantified. The strength of this research is its relatively simple and objective features of the physical environment to evaluate abstract qualities. The measures are useful for understanding how environmental qualities, as well as patterns and combinations of particular qualities, affect people's perceptions of landscape and their willingness to be active in the space.

Further research is needed to establish stronger links between subjective indicators and landscape physical features by considering all factors such as cognition and behavior of the observer in environment.

According to the findings of this study Noghjan Bazaar is being redesigned in University of Mashhad as a design studio assignment. This experiment and the above study illustrated again that design of the traditional and historical fabric of cities should be conducted using quality of space according to user's preferences that considers preservation of common memory of the community through preserving historical and cultural values of space.

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