

IDENTIFYING THE MEASURES OF EVALUATING A BUILT LANDSCAPE IN COMPLIANCE WITH THE PSYCHOLOGICAL PROCESS OF PERCEPTION

(CASE STUDY: IRAN, MASHHAD, HISTORIC BAZZAR "NOGHAN")

Authors:

Mostafa Abbaszadegan, Associate Professor, Department of Architecture and Urban Planning, Iran University Science and Technology. Narmak, Tehran-Iran.
Email: mostafa.abbaszadegan@gmail.com

Hooman Ghahremani*, PhD Candidate in Urban Planning & Design, Department of Architecture and Urban Planning, Iran University Science and Technology. Narmak, Tehran-Iran.

Corresponding Author: Hooman Ghahremani
Email: hghahremani@iust.ac.ir
Tel: 09155151399

Eram Mojtahed Sistani, Master student in Landscape Architecture, Anhalt University of Applied Sciences, Germany.
Email: eram.mojtahed@yahoo.com

Identifying the measures of evaluating a built landscape in compliance with the psychological process of perception

(Case study: Iran, Mashhad, historic bazaar "Noghan")

Abstract

This study tries to set a framework in redesigning environment that is to comply with human perceptive processes and upon the criteria of formal evaluation. The subject focuses on formal landscape features and it studies the criteria relevant to their evaluation.

The approach of this article presents a methodology to assess the perceptual environment. It uses substantial analysis which presents a framework to evaluate subjective qualities related to perception in urban design. By taking the renowned Gestalt theory and Gibson's findings into account, this study intends to describe the influence of perspective on observers' spatial perception. Based on further examinations of such diversified aspects as motion or vision angles, the authors attempt the proposition of a comprehensive method for future formal aesthetic landscape analyses.

This research on the following topics has reviewed the readings on: (a) Theoretical approach to perception (b) definitions of different parts of perceptual procedure (c) important factors in perception.

In this paper the historic Noghan Bazaar in Mashhad has been examined of how people's perception and conduct can be directly influenced by the organization of layout of formal landscape features. The outcomes would be the identification of a connection between the designed, physical aspects and subjective sense of the environment and some strategies for organizing perceptual-formal features of the environment.

Key word: *Environmental perception, formal (objective) features, Evaluation criteria, historic 'Noghan' bazaar.*

Introduction

From the early 1960s onwards, environmental perception has been part of an interdisciplinary discussion. The relationship between humans 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.

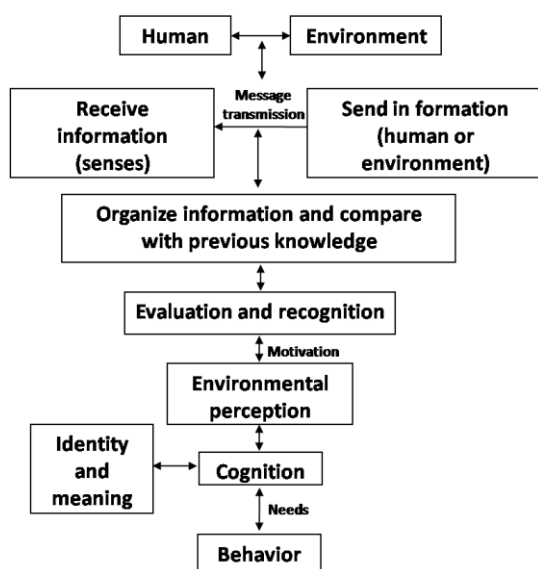


Figure 1: perceptual process; by Authors.

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.

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 with the aim in mind to develop operational definitions and measurements for future design qualities of landscapes. 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, a historical bazaar will be scrutinized along a set of suggested guidelines and perspectives culminating in a final redesign proposal.

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, by having positive or negative impressions on their reactions and which formal features cause these subjective senses.

By considering the reactions and reflections recorded through on-site interviews, we conclude that there is a

connection between the designed, physical aspects and subjective sense of the environment. Therefore, a set of perspectives are proposed for redesigning to modify negative or improve positive impression of relationships.

Theoretical precedence of perception

Perception is interrelated to a mental concept and its impact on human's life. Transactional theory as defined by Ittelson(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) is 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].

Perceptual process

The environment is full of stimuli that have the potential to be perceived and can attract our attention through the 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 the 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 perception towards the stimuli of the built environment refer to processes of psychological relationship between humans and their environment [1].

Factors influencing perception

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].

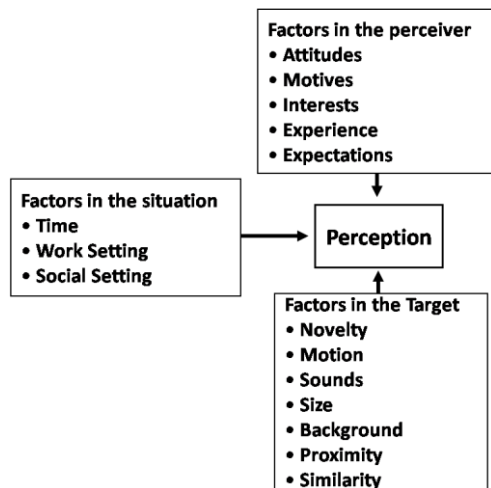


Figure 2: Factors influencing perception; by Authors

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, whereby both are shaping and being shaped in an interactive process [8].

This study considers expert paradigm by recognizing a connection between objective and subjective measures.

Measures of evaluating landscape are both objective and subjective and can be collected by members of a research team (often students) 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].

Subjective features

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, and making landscapes distinguishable and memorable [10].

Legibility:

Legibility refers to the ease with which the spatial structure of a place can be understood and navigated as a whole. The legibility of a place is improved by a street or pedestrian network that provides travelers with a sense of orientation and by physical elements that serve as reference points [11].

Enclosure:

Enclosure refers to the degree to which streets and other public spaces are visually defined by buildings, walls, trees and other elements.

Human Scale:

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. Building details, pavement texture, street trees and street furniture are all physical elements contributing to human scale [12].

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. Physical elements that influence transparency include walls, windows, doors, fences, landscaping, and openings into midblock spaces [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. Tree lines, building projections, marked crossings all create linkage. Linkage can occur longitudinally along a street or laterally across a street [11].

Complexity:

Complexity refers to the visual richness of a place. The complexity of a place depends on the variety of the physical environment, specifically the numbers and kinds of buildings, architectural diversity and ornamentation, landscape elements, street furniture, signage and human activity [13].

Coherence:

Coherence refers to a sense of visual order. The degree of coherence is influenced by the consistency and complementarity in the scale, character, and arrangement of buildings, landscaping, street furniture, paving materials, and other physical elements [14].

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 core of the city, the Bazaar lost some of its credential role in the structure of the city.

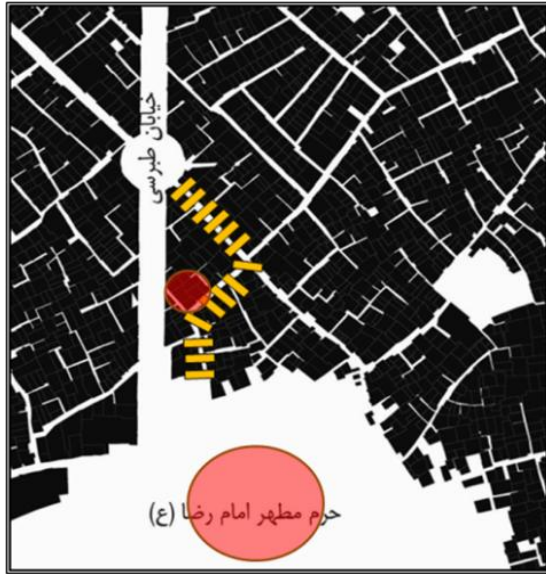


Figure 3: The location of Noghan Bazaar, Shrine of Imam Reza and KHeshti dome; by Authors.

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, the perception process and upon the criteria of formal evaluation to suggest the revitalization plan. In this method the built environment of bazaar has been evaluated from the perspective of observer in space. The theoretical base of this method is Gestalt theory and considering movement features, vision angle from Gibson theory has been utilized as a method of formal aesthetic analysis.

In a pair of field experiments a relationship between the physical features of environment and landscape qualities was discovered. Based on expert paradigm, within a study of the pedestrian experience of Noghan Bazaar, skilled observers and general public were asked to walk through consecutive spatial sequences. The reactions and reflections were recorded through on-site interviews.

From these experiments one can conclude that there is a connection between the designed, physical aspects and subjective sense of the environment.

Table1 : Subjective measures are shaped by objective qualities; by Authors based on site interviews.

landscape quality(subjective)	Physical features(objective)
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 (facad and pavement)
comfort	<ul style="list-style-type: none"> • vegetation • reduction in congestion of vehicles
safety	<ul style="list-style-type: none"> •Lighting •Dominance of pedestrian •Width of pedestrian way
Imageability	<ul style="list-style-type: none"> • memorable form or functions
Abruptness	<ul style="list-style-type: none"> • unexpected elements in an uniform and coordinated context
Rhythm	<ul style="list-style-type: none"> • frequent formal elements
Hierarchy	<ul style="list-style-type: none"> • no identical formal and functional sequences
Distinction	<ul style="list-style-type: none"> •Diversity in spatial enclosure •Diversity in the scale of space •Contrast in façade, form , size, usage in space • Diversity in color and texture of pavement • different kinds of lighting • Involving various senses
Continuity	<ul style="list-style-type: none"> •Observing and experiencing landmarks in a melodic order • Passing the way frequently • curvature of the way • Rhythmic repetition in urban elements • the situation of elements in serial visions • harmony in façade, form, functions • color and texture of pavement
Motion awareness	<ul style="list-style-type: none"> •Defining focal points to find the direction • straight way or with smooth curved which does not loose it's main direction
Dominance	<ul style="list-style-type: none"> • size and location of elements • the rate of using functions

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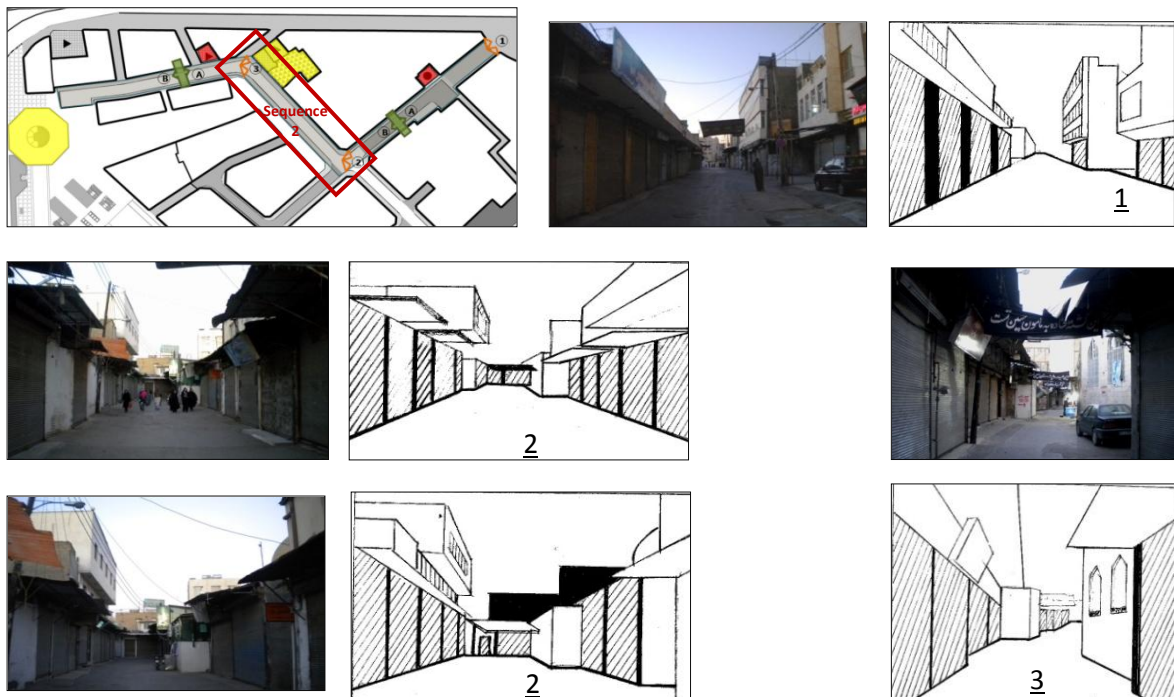


Figure 4: Perceptual Analysis according to Gestalt and Gibson theory; by Authors.

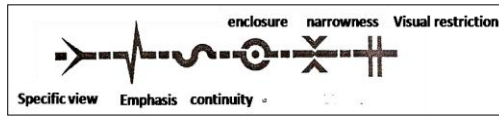
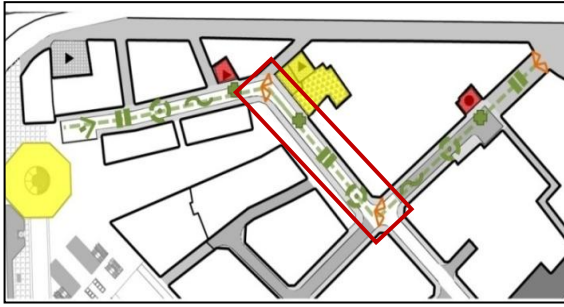


Figure5: Landscape qualities effect on perception ; by Authors based on Michael Trieb point of view[15].

Table 2: Matrix of hypothesized relationships; by Authors based on site interviews.

landscape qualities (subjective)													Physical features (objective)	
Rhythm	Abruptness	Emphasis	Imageability	Safety	Comfort	Enclosure	Human scale	Coherence	Directional differentiation	Simplicity	Dominance	Continuity		Motion awareness
												+	+	Curve in the ground line leads to visual mobility
+						+						+		Sense of continuity by vertical rhythm along the street
-			-					-				-		Uncoordinated skyline
		+				-	+							Static sense in space due to functional points
						+						+	+	Sense of curiosity and 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 façade
														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
			+											Memorable functional and physical features
		+												Similar activities

According to the on-site interviews, in the following serial visions of Bazaar, we scrutinize some aspects like Rhythm, Continuity, enclosure, human scale, dominance,... related to formal features which create different qualities effect on perception of the environment.

Based on a formal aesthetic analysis (figure 4 and 5) and positive or negetavie impression on perceptive power and subjective reaction of observer to each consequent landscape quality in sequence 2 of this Bazaar, matrix of hypothesized relationships was formed.

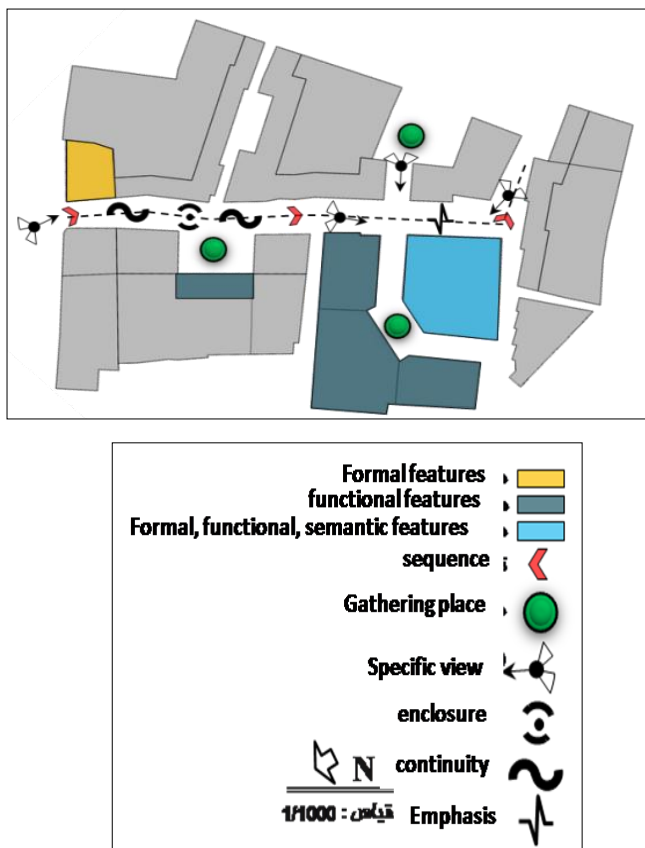


Figure 6: Landscape qualities effect on perception in redesigning sequence 2; by Authors based on Michael Trieb point of view[15].

By considering this matrix, a set of perspectives are proposed for redesigning to modify negative or improve positive impression of relationships.

Conclusions

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

This research included testing the visual indicators in expressing visual changes, that is, changes in indicator values will have a subjective impact, and that visual changes imply changes in the indicator values.

It has illustrated that qualitative landscape feature 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 researchers that are interested in 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.

Authors believe that further research is needed to establish stronger links between subjective indicators and landscape aesthetic analysis by considering all factors may affect cognition and behavior of the observer in environment.

Despite these limitations authors believe this framework is a useful approach to visual landscape character assessment.

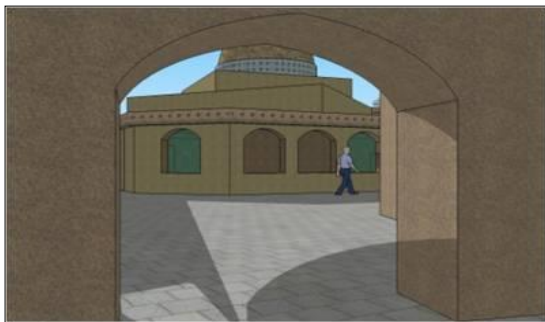


Figure 7: Redesigning case study; by Authors.

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