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Qualitative Assessment of the Sensory Dimensions of Space in Historical Bazaars from the Users' point of view (Case Study: Qazvin Bazaar)*

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Abstract

Problem statement: Perception is our sensory experience of the surrounding world and requires the recognition of environmental stimulus and responses to them. Architecture is a multiple realm of sensory experiences that mutually affect each other and are interconnected and provide an opportunity for perception of a space. Throughout history, “Iranian traditional bazaars”, with a vast collection of land uses and adjacent buildings, were lively centers of cities, and social interactions. These covered bazaars, which are valuable relics from the pre-modern era, can be considered as multi-sensory spaces, unlike contemporary shopping malls and shopping centers, which make sense of belonging to a place among users.

Research Objectives: The present study attempts to qualitatively examines the senses cape components in the Qazvin Bazaar from the users' viewpoint, considering the importance of sensory perception system in spatial perception and the role that this perception can play in the process of cognition and behavior.

Research Method: The present study is a historical-descriptive research in which the data were analyzed using analytical-comparative techniques. The data were collected using secondary (desk) study and field study.

Conclusion: The results indicate that proper responses to various aspects of the sensory system in historical bazaars have created a multi-sensory environment while maintaining the interference of sensory domain. The qualitative cognition of the sense's cape components in the present study determined that the visual landscape has the greatest role in the perception of environment, and like the tacti escape, it is fixed during the day. On the other hand, the soundscape and smells cape are considered as two stimuluses affecting the sensory enrichment of the environment, which have more changes during the day than other environmental stimulus.

Keywords: *Perception of environment, Multi-sensory Architecture, Iranian Bazaar, Qazvin Bazaar.*

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Qazvin)” which is done in 2019, under the supervision of Dr. Dariush Sattarzadeh and advisement of Dr. Lida Balilan Asl in Islamic Azad university (IAU), Tabriz, Iran.

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Introduction

Problem statement

In the pre-modern period, urban space had fixed elements that comprised the structure and backbone of traditional cities. These spaces, including citadel, fortress, gate, city wall, and bazaar, etc., were of spaces that were tied with people's lives and livelihoods. Among the spaces available, public spaces are of great importance because they represent the domination of these thoughts. Commercial spaces, such as shopping malls, bazaars, passages, shopping streets, etc., are considered as public spaces and also, the result of the changes and developments of these thoughts (Habibi & Mahmoudi Patti, 2017, 44).

Throughout history, "traditional Iranian bazaars" with a wide range of uses and adjacent buildings, were an active center of the city and used for social interactions. In these bazaars, in addition to economic exchange, many social, religious, and even political events were used to take place. The bazaar was the most important communication axis and urban space in ancient Iranian cities. Like other phenomena, bazaar initially has a simple form and function, but it has gradually changed according to the spatial and temporal needs (Abbasi; Habib & Mokhtabad, 2015, 291). As the importance of religion increased in society and government and commercial relations developed during the Safavid period, the bazaar has been considered as the most decisive and most significant urban element in the history of Iranian urbanism, and has always been paid attention by citizens and rulers. Gradually, with the advent of modernism in Iran, historic centers and valuable textures of cities have been evacuated and these centers have been degenerated, resulting in the decline and degeneration of traditional Iranian markets. These bazaars, due to various uses and special architectural features, seem to have multisensory environment, which has effective in creation of the sense of belonging in this space.

Today, there is no such a sense of belonging in contemporary passages.

In the various definitions of perception, the creation of meaning, the meaningfulness of sensory findings as well as the subjectivity of the perceptual process play a core role. From this perspective, perception means a mental or psychological process that is responsible for selecting and organizing information and ultimately, making them meaningful (Irvani & Khoda Panahi, 2018, 25). In fact, perception is our sensory experience of the surrounding world and requires the recognition and understanding of environmental stimuli, as well as responses to these stimuli. Through perceptual process, we obtain information about the environmental elements that are vital to our survival. Perception is not only our experience of the world but also allows us to be active within our environment (Abbasi et al, 2015, 296). In the sciences on perception and understanding of the environment, it is emphasized that those systems directing the environment and human's perception are of great importance. Environmental perception is a "subjective and objective" process that is achieved by interacting with the environment. This process has a dynamic nature and can lead to a sense of place in the environment.

Therefore, considering the importance of the sensory perception in spatial perception and the role of this perception in human's cognition and behavior and using the psychological findings on perception, the present study attempts to qualitatively study the sensory perception process in Iranian historical bazaars (case study: Qazvin Bazaar). In fact, the results of the present study can represent the role of human senses in meaningfulness of historical bazaars, and also, they can be used to design architectural patterns for new business centers considering the human's perception of the environment and its effect on creating a sense of belonging to the environment.

Research question and hypothesis

According to the problem statement, the main question raised in the present study is:

How did sensory dimensions of space in Iranian historical bazaars affect the process of recognition and perception and thereby...the sense of place? To answer this question, the following hypothesis is raised:

Due to a multi-sensory environment in the Iranian historical bazaars, human's senses were stimulated and his cognition and behavior were influenced.

Research background

Literature review of the research background shows that there are limited quantitative studies on the sense's cape components in historical bazaars and their role in the cognition of these spaces. In the following, the most important studies and their findings are presented and analyzed:

Abbasi et al. (2015), in their study, developed some principles and criteria for spatial perception of the architecture of Iranian traditional bazaars. The results of this research were about the characteristics of the functional system of the Iranian bazaars, the conceptual model of the physical system, the perceptual system of the Iranian bazaars, the conceptual model of the perceptual system, the semantic system of the Iranian bazaars and the conceptual model of the semantic system. Finally, a comprehensive conceptual model of spatial perception of Iranian traditional markets has been described.

Lotfi and Zamani (2015), in their research, investigated the role of senses cape components in the quality of community spines in Aligholi agha Spine, Isfahan. The results of this study showed a significant relationship between the senses cape components and the quality of community spine. Accordingly, the sense of time was the most effective indicator and had the greatest effect on the quality of community spine,

followed by tacti escape, smells cape, visual landscape, soundscape, and tastes cape.

Salehinia and Niroumand Shishvan (2018), in their research, explained the role of sense-based senses cape components in the quality of sensory-environmental perception of the passageway of New Arg of Tabriz. The results indicated that there is a positive and significant correlation between the senses cape components and the quality of sensory perception of the passageway of New Arg of Tabriz. Accordingly, the senses of touch, hearing, taste, smell and sight, had the greatest role in perception, respectively.

In the present article, it is attempted to evaluate the quality of the sense's cape components in the historical Qazvin Bazaar from its. Users' view of points. So, the concept of perception of the environment and its process are discussed in brief. Then, sense of environment, senses cape and its components are introduced to be evaluated in the historical Qazvin Bazaar, in order to recognize the components of sensory perception in Iranian bazaars (Fig. 1).

Theoretical Foundations

An individual's perception of the universe and how he interacts with it are of the important issues considered in the design of architectural works. Since an individual's perception of the universe forms the level of interaction between him and the universe, it is necessary to know the levels and stages of his perception to enhance the quality of architectural works and urbanization (Taghdir, 2017, 49). The topic of sensory perception is important because our surrounding world contains information and stimuli and it is necessary to recognize these concepts in order to better interact with the environment (Atkinson, 2012, 11).

• The concept of environmental perception and its process

Perception is a process mechanism that is related to how the sensory organs are stimulated

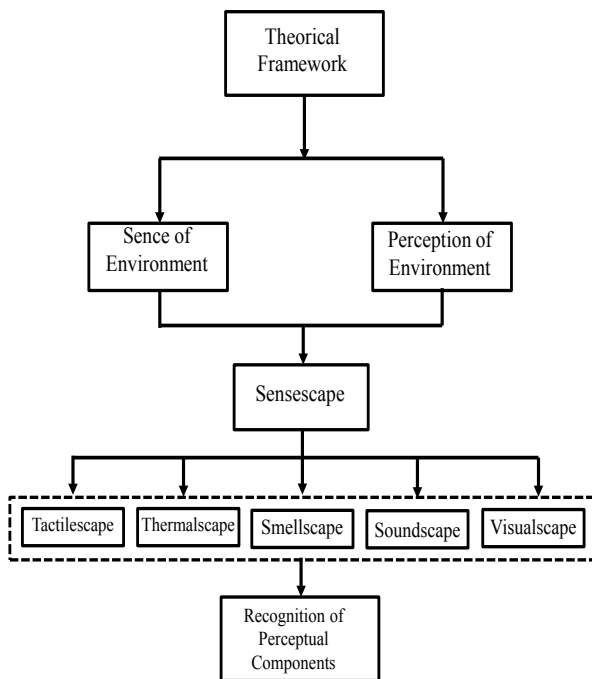


Fig. 1. The theoretical framework of research. Source: Authors, 2018.

and information is gathered, and the cognition is the internal mechanism of the process, and how individuals' previous experiences, psychological factors such as motivations, values and personality (introversive or extroversive) influence the interpretation of sensory information (Shahcheraghi, 2009, 4). People need to get and understand this information to properly communicate and interact with the surrounding physical environment. Perception of the environment is a process by which a person chooses the necessary data from the environment based on his needs (Sharghi; Ma'atof & Asadi, 2017, 78). Therefore, we evaluate (recognize) the environment and conditions, and behave in a specific way through complex mental processes, based on the information we get from the environment (feeling) and analyze (perception) (Pakzad & Bozorg, 2012, 54).

Of course, an individual is not inactive and apathetic in the perceptual position. The formation and deployment of early perceptual schema since birth due to diverse environmental

stimuli provide the first perceptual experiences for humans (ibid, 138). In general, it can be said that what our sensory receptors have received from the surrounding environment is interpreted by the brain. This action is called perception and leads to recognition. In fact, the perception is the stage between feeling and recognition of the environment. The feeling is the external mechanism (Fig.2). Recognition is an internal mechanism. Perception is the stage between these two external and internal mechanisms. For this reason, a part of the perception based on the environment is similar among people, but another part of the perception, which is based on the individual's brain and mind processes, is completely personal and unique (Shahcheraghi & Bandar Abad, 2015, 177).

• **Perception of the environment and multi-sensory architecture**

Humans live in a multisensory environment that is surrounded by sights, smells, sounds, tastes, and touch phenomena, and the way in which these stimuli are experienced helps us understand our surroundings (Mount & Cavet, 1995, 52). The development of multi-sensory environments began in the 1970s (Hazreena, 2010, 26). These developments were used more in the field of learning environments and some debates on growth psychology raised. Anatolie Olds, child psychologist, refers to this process in children and states that children are in the environment and enjoy elegance in color, light, sound, smell, tactile sensation, texture, volume, movement, form and rhythm around themselves (Hanachi & Azadarmaki, 2012, 91). Among the architectural phenomenologists, the attention to "multi-sensory perception" was first introduced and described in a classical and coherent manner by Pallasmaa, and Steven Holl's reflections on the special presence of hearing and tactile senses, referred to as "phenomenal zones" (Holl, 1994), should be influenced by him.

Architecture is a multiple realm of sensory

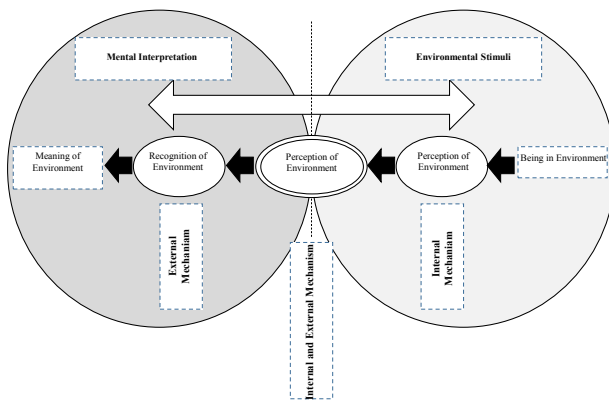


Fig. 2. The internal and external mechanisms of perception. Source: Shahcheraghi & Bandar Abad, 2015, 177.

experiences which mutually affect each other and are interconnected. This means that architecture is not merely an image of five classic senses. Tactile experience in architecture is multi-sensory, the qualities of space, material and scale are coordinately divided between eyes, ears, nose, skin, tongue, body and muscle. This “multi-sensory architecture” is found in historic gardens, especially in Iranian gardens, and today it is used in the design of healing gardens in the hospitals using seven principles, and such environments can help to shorten the recovery of patients (Shahcheraghchi & Bandar Abad, 2015, 174).

According to Plasma, each tactile experience in architecture is multisensory. Accordingly, he raises the interaction of sensory perception vs. visual perception. According to him, tactile sensation has existed in historical architecture and was emphasized, but with the advent of modernism, a deep gap emerged within the realm of sensory perceptions. This view can be known consistent with Gaston Bachelard's, a French philosopher, approach to the “polyphony of sensory perceptions” (Sohangir & Nasir Salami, 2017, 496).

- Senses cape

According to its definitions, perspective/image is a product of human interactions with the environment in outer spaces (Berk, 2008) and an expression of the reality of human living space,

which is understood by the user (Mansouri, 2004). The city is a realm of landscapes and sensory opportunities that change with respect to time, space, culture and traditions and in which one interacts with the ground he defines his place in it (Picker, 2003). Although the first encounter with space is considered as a visual experience, and perception of space usually begins through appearances and evidences, visual qualities are only one of the spatial qualities of the environment (Lotfi & Zamani, 2015, 44). In other words, although sight is the most important sensation in perception, sound, odor, temperature, balance, direction, material and texture of the elements defining a space play an important role in this process.

In the process of perception of environment, there is a mutual relationship between the characteristics of the urban environment and perception, recognition, evaluation and behavior of human beings (Golkar, 2008). Golkar categorizes the components of environmental quality in three main categories: functional components (behavior settings, safety, security, compatibility, etc.), aesthetic experimental components (physical quality, sensory perception quality, mental perception quality), and environmental components (climate quality, sounds, odors, ecosystem efficiency and ecosystem balance, and pollution reduction). In general, it can be said that all senses are active in perception of the perspective phenomenon (Daviran; Khodaei; Gholami & Daneshvar., 2012: 48 ; Moini, 2012, 28). At the stage of perception, the geometry and perceptible characteristics of an urban environment, such as visual, sound, tactile, and smell characteristics, are subjected to human senses, and Galkar called this set of characteristics “cityscape”. Considering that at this stage, environmental information is perceived in the form of visual landscape, soundscape, smells cape, tastes cape, and tacti escape by the main five senses, they shape the senses cape of the environment together (Lotfi & Zamani, 2015, 45).

- Soundscape

The sound is a change in the air pressure caused by the wave motions of air molecules, resulting from the vibration of objects. While sound has a physical nature, noise is a psychological concept and defined as undesirable sound (Mc Andrew, 2013, 94-98). Audible space has no specific boundaries and emphasizes space itself, rather than the components in space. Audio coordination is temporal, while visual coordination is spatial, so hearing is an unexplainable and passive sense. Sound induces a dynamic sense and helps the person to understand the sequence of time and the scale of space; therefore, as compared to sight, auditory perception is generally poor in information and rich in senses (Carmona; Tim; Oc & Tiesdell, 2003, 88).

- Smells cape

Our sense of smell can provide us with a strong perception of place and position. Smells can distinguish the experience of the city from that of the village. As discussed earlier, it's more difficult to describe the sense of smell in contrast to the senses of sight and hearing. In describing the visual dimensions, metaphor can be used and imitation can be used to describe the auditory dimensions. So, we resort to intra-society relations to describe the smells cape. Since consciousness and language are closely related, one can understand why this smell information plays a major role in unconsciousness (Campbell, 2002).

- Tacti escape

Tactile is the first sensation with which we communicate with the world. Such a communication is performed through hands, legs, lips, face, and skin (Degen, 2008). The environment is experienced during a continuous movement of the subject by touching and perceived texture of the environment such as the coldness of the cement and the roughness of the pavement. Using tactile sensation, an individual becomes aware of the heat and quality of the surrounding surfaces, thereby the sense of place and being in the world (Roadway, 1994). Therefore, all the information received obtained from an

environment by the tactile sensation, including heat and cold, roughness and stiffness, pressure and the level difference shape the tacti escape of the environment.

- Visual landscape

Visual landscape or image is what is seen in the urban space (Lotfi & Zamani, 2015, 45). Sight is the last evolved sensation and is the most complex sense. More information is sent to the nervous system through the eyes and much more information is received by the eyes as compared to hearing and touch. The information gathered by a blind person in an open space is limited to a circle of twenty to one hundred feet while a sighted person could see stars (Hall, 2006, 5).

- Thermal landscape

One type of receptors in the skin is thermoreceptor. Thermoreceptors are neurons with their free ends located just below the skin (in the dermis of the skin). The thermal sensation also regulates body temperature. Human skin is very sensitive to temperature and detects a change of less than 1 ° C under normal conditions (Atkinson, 2012, 276). The feeling of cold and warm in different parts of the skin depends on the cold and warm spots on the skin. The comparison between these points shows that the cold spots are more than warm spots (Iravani & Khoda Panahi, 2018, 94).

The important thing about the cold and hot sensations is sensory thresholds. In the sense of touch, like other senses, there are thresholds. The thermal thresholds play an important role in the utility of experience of space. We are not comfortable in spaces where have the feeling of too much heat or cold despite their visual beauty, and we will not have any tendency to be there. To do this, it is required to provide climate comfort (Taravat, 2013, 55).

The conceptual model of sensory perception in Iranian traditional bazaar

The quality of environmental perception is achieved through the components that by identifying the functions and effects of each of the

components, some solutions to assess the quality of architecture and urbanization and suitable patterns for designing new business centers in the contemporary era can be achieved. After studying the principles of sensory perception of the environment and perceptual sensory systems in Iranian bazaars, it is attempted to evaluate these principles in Iranian traditional bazaars, in order to recognize the sensory components in these bazaars from the users' point of view.

Since there are limited studies on the assessment of sensory perception and factors affecting it in the Iranian bazaars, in this section, a conceptual model is explained to assess the obtained perception of the architecture of Iranian bazaars by studying the theories proposed in the field of environmental quality and identifying their effects on perceptual indicators of these spaces.

The conceptual model of the perceptual system of the Iranian bazaar is based on the creation of sensory richness in the environment, with

emphasis on all senses, ...the creation of the quality of inviting and the provision of the ground for reflection and thought in a person, the attention to the sensory, form and symbolic aesthetics, the creation of a mental image and the emphasis on memory, the emphasis on meaning, the attention to ordering of the senses and the provision of the ground for acquirement of knowledge in the environment (Fig. 3).

Method

Since in the present study, it is attempted to fundamentally investigate and describe the process of perception and all its components by looking at the references on the Iranian bazaars, this study is a historical-descriptive research in which the data are analyzed using the analytical-comparative techniques.

• Introduction of the statistical population

In the present study, the statistical population included all users of the Qazvin bazaar, including

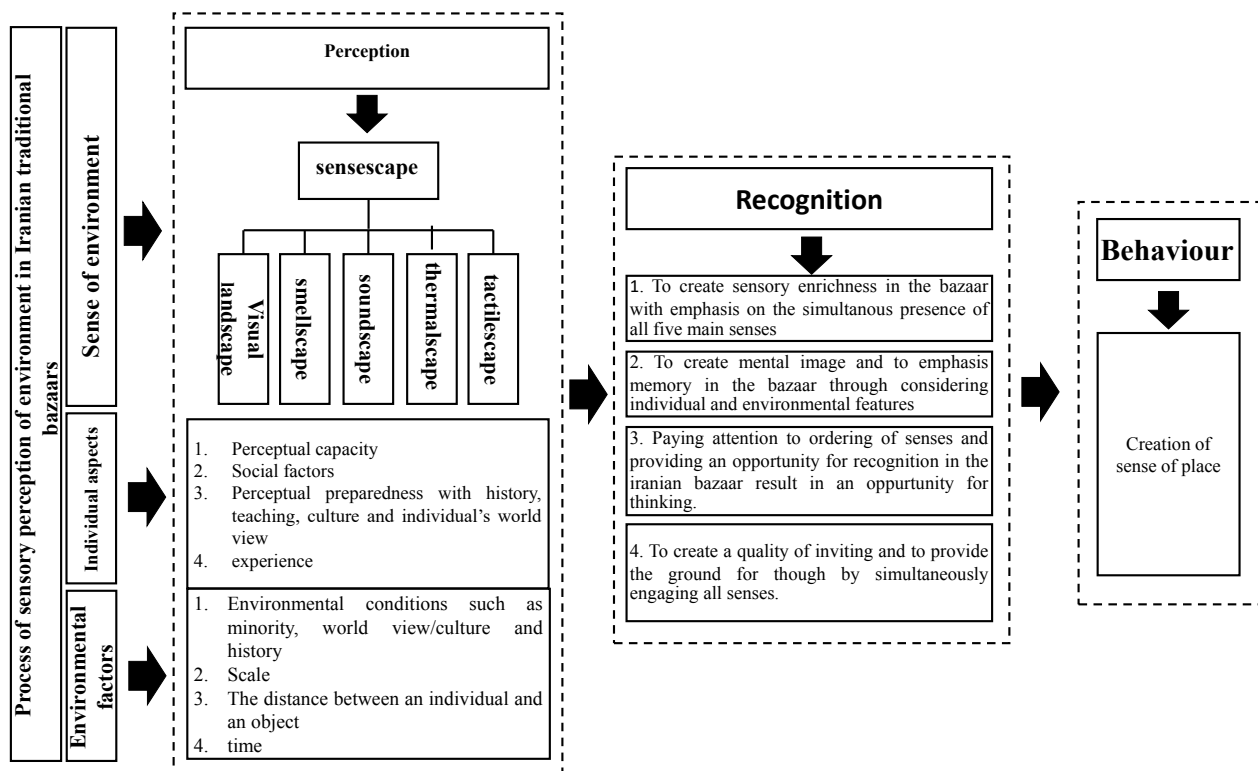


Fig. 3. Recognition of sensory perception components in Iranian traditional bazaars. Source: Authors, 2018.

marketers and pedestrians, in November 2013. The samples were selected using a random sampling method. Considering the number of shops along the studied path and the inconstant number of pedestrians, the sample size was estimated to be 237 persons using the Cochran formula. Due to the possibility of the lack of proper response during the research or the withdrawal of some samples, the sample size was considered to be 250 persons. Finally, the point of views of 227 persons were investigated. Regarding the fact that a large number of participants did not have enough information about the research topic or have a low level of education, the researcher accompanied and guided them as follows: at the studied station, they were asked to introduce the senses cape components and score them based on a 5-point Likert scale.

• Research procedure

In the present study, the sensory symbols of space were qualitatively and quantitatively investigated and assessed and cognition was performed at three stages. In the first stage, the body, activities and land use in the studied areas has been studied. In the second stage, sensory recognition of space in the time dimension was investigated using spider diagrams, in order to evaluate the being multi-sensory of space. These diagrams were plotted using the scores of the sense's cape components, which given by the participants. This stage is a nearly complete set of effective environmental stimuli during a period (one month). A period of one month was selected due to the variety of social events and activities and thereby sensory events occurring within a month. However, it is necessary to investigate the senses cape components of the environment during a shorter period time and in the spatial sections. Thus, in the second stage, the descriptors of the senses cape components were qualitatively investigated from the users' point of view (Table 1).

Case study

In the present study, Qazvin Bazaar was selected

as a case study. The Qazvin Bazaar is a historical bazaar located in the district 1 of Qazvin municipality and in the historical texture. Its total area is fourteen hectares.

In order to carry out the research more precisely, and due to the limitations for doing field study at different times and in different places, a part of the Qazvin Bazaar, including forage-sellers Rasteh¹, tanneries Rasteh, sieve makers Rasteh, pollen Bazaar, chahar suq, draperies Rasteh, coppersmiths Bazaar, and ultimately the eastern entrance of the al-Nabi mosque and al-Nabi mosque, was considered as a case study. According to the maps below, studying the sensory dimensions of the space was limited to space with an area of 1200 square meters.

Findings and discussion

• Preliminary field study and recognition of the sensory dimensions of space

Cognition is the first step in this methodology and research. At this stage, the body, activities and land use in the case study are investigated. Figures 4 and 5 show the land uses, the access hierarchy and activities in the case study. In the next step, sense walking of environmental stimuli in the case study and in the given period by the users is investigated. At this stage, due to the complexity of sensory changes in the environment at different time intervals, it was tried to study the environmental stimuli with longer lastingness. The visual and tactile stimuli are recorded easier due to their longer lastingness. Other environmental data such as smell and sound stimuli have more variety and shorter lastingness, and can range from the smell of perfume used by the pedestrians to the smell of a restaurant or a perfumery, so these senses are different both in terms of lastingness and sources. Based on this map, environmental data was categorized into five categories: visual, touch, auditory, thermal and chemical and in four-time categories of periodic, rhythmic, temporary,

Table 1. Dispersion of the statistical population in gender and education. Source: Authors, 2018.

education	Statistical population		Diploma and lower level degrees	Associate degree	Bachelor	Master's degree and higher
	Gender					
Gender	Male	Number	39	10	40	14
		%	46.5	86.5	46.5	40
Female	male	Number	45	3	46	21
		%	53.5	13.5	53.5	60
Total		Number	84	22	86	35
%			37	9.5	38	15.5



Fig.4. The limits of case study in the Qazvin Bazaar, Path 1. Source: Authors, 2018.

and permanent. These environmental data were collected randomly over a period of one month.

• **Recognition of the sensory dimensions of space in the time dimension in the Qazvin**

Bazaar

Perhaps, in this section, the difference between the design of Iranian traditional bazaars and the contemporary business centers becomes more



Fig.5. The limitations of case study in the Qazvin Bazaar, Path 2. Source: Authors, 2018.

obvious. The purpose of the design was to create a space based on a comprehensive design that was perceived and experienced repeatedly by users. In order to examine the dimension of time, it is necessary to consider sensory stimuli in the fourth dimension, namely, “time”. Therefore, being multi-sensory of the studied samples were evaluated in the period from 8:00 to 18:00 (according to the working time of samples and season). This taking note was performed at 2-hour intervals and displayed using spider diagrams. The symmetry of the diagrams represents the being multi-sensory of space. Figs. 6 to 11 show sensory perceptions at different times in the Qazvin Bazaar.

The results of the sensory register in the dimension of time shows what sensory changes have occurred over time in the area covered and how much they can affect human perception of the environment.

Since there is various land uses in the bazaar which overlap their activities, there are different components of senses cape (sensory variety)

in the market at different hours of the day. The forage-sellers Rasteh and chahar suq, due to the variety of land uses in them and the traffic of different people including buyers, shoppers, carters, are more multi-sensory. The activity in this Rasteh starts earlier than the rest, depending on its type of land use, and continues until the end of the night. Other parts of the case study have lower sensory density. The path ends with the coppersmith bazaar and the western entrance of the al-Nani mosque and al-Nabi mosque. This path is more attractive to other paths in terms of senses cape components because the user reaches a peaceful destination (al-Nabi mosque) after crossing the noisy path. The occurrence of each of the behaviors in spatial, temporal, and activity settings has its own unique sensory characteristics that give special variety and attractiveness to space.

An analysis of the relationship between the dimension of time of activities and the being multi-sensory of space indicates that increasing activities makes the space more multi-sensory.

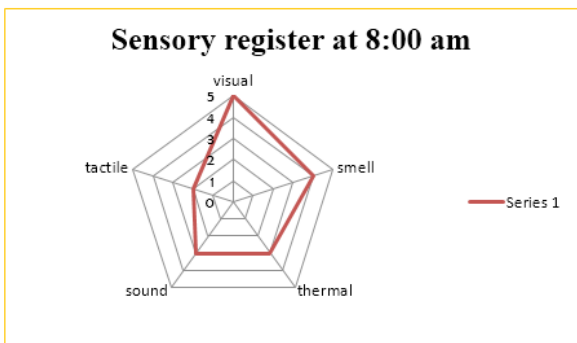


Fig. 6. Sensory register at 8:00 am. Source: Authors.

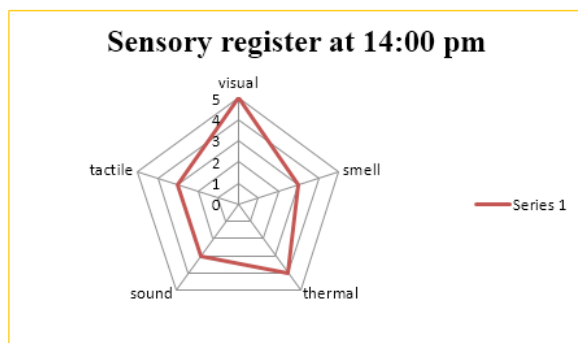


Fig.9. Sensory register at 14:00. Source: Authors.

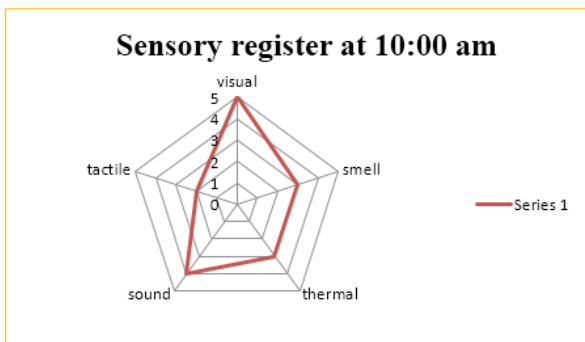


Fig. 7. Sensory register at 10:00 am. Source: Authors.

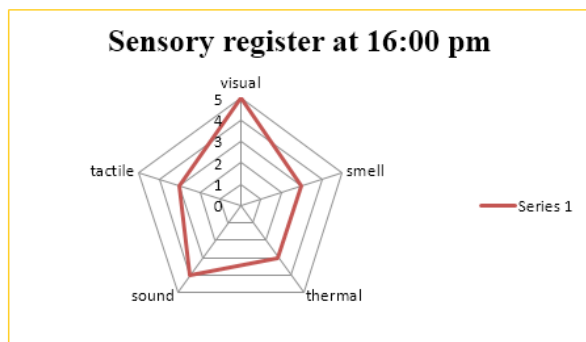


Fig. 10. Sensory register at 16:00. Source: Authors.

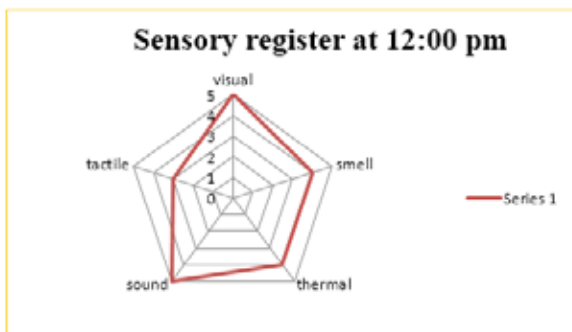


Fig. 8. Sensory register at 12:00 pm. Source: Author.

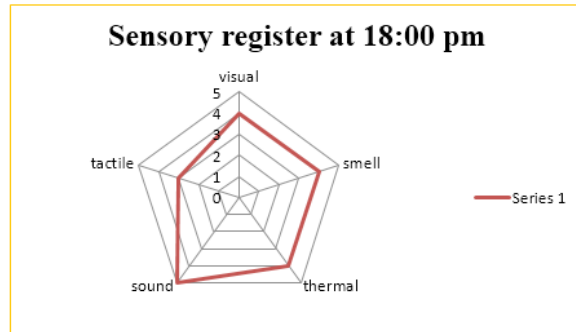


Fig. 11. Sensory register at 18:00. Source: Authors.

For example, between 10:00-13:00 and 17:00-19:00, the number of sensory stimuli and their variety increase, resulting in a more multi-sensory environment. Smells, a small change in space, affect the senses cape components. For example, at noon and in the evening, when restaurants start to work, chemical stimuli are affected. The sunset time was at 17:30 (sense walking was done in the fall), has a very important characteristic. At this time, with diminishing illumination, the visual sensory dimension of space, that

has the highest score throughout the day, also decreases. Also, the sensory-chemical dimension of space increases due to the cooling down of the atmosphere and the smell of foods from the restaurant and fast food shops (see Fig. 11). Fig. 12 shows the comparison of the values of each sense's cape component at different hours. According to Fig. 12, it is found that visual landscape has the highest value, as expected. The value of this dimension only diminishes during sunset when illumination decreases. Another component, which

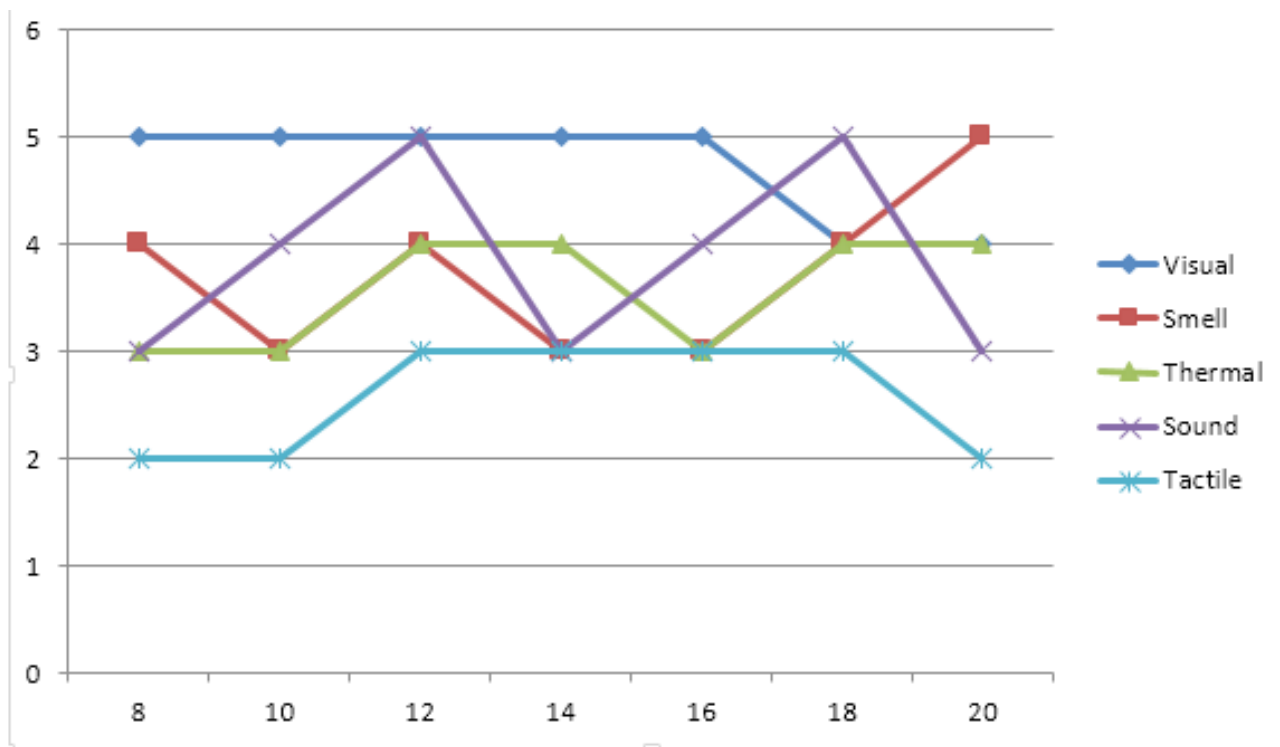


Fig. 12. Comparison of the values of each sense's cape components at different hours. Source: Authors.

has a lot of fluctuations, is soundscape. This is due to diversity in the source of the sound and the scope of perception. The permanent presence of people and noises in the bazaar as the gray sound and background and the voices of the shoppers and caterers which fluctuate during the day, are resulting in adversity in soundscape component during the day. For example, at noon when Adhan is played and people are called to prayer in Imam Sadeq and Martyr Sales mosques, the soundscape is heavily influenced.

Another component that fluctuates during the day is a smells cape. In the early hours of the working time, the smell of fresh vegetables, as well as chicken and fish, heavily affect the smells cape. This component diminishes until noon and it increases again when restaurants start to work at noon. This stimulus diminishes in the afternoon until sunset, and increases again at the sunset time when restaurants start to work.

The importance of thermal stimuli has increased as the environment became less desirable. The value

of this component increases at the time of sunset when the temperature decreases at 17:³⁰ to 20:00. Also, moving inside the bazaar and through the covered lanes and passing through the courtyards affect the thermal stimulus. Another environmental stimulus, which plays less and almost stable role in the environment, is the touch cape. This stimulus has the slightest tension throughout the day and is constant. The touch cape is largely influenced by individual aspects and can be different between the young and the elderly and between men and women. This is influenced by the individual, and, of course, the lack of arousing curiosity in space is due to frequent experience of this scape, because the desire to touch takes place in order to understand a new experience and to know more about objects, while during the recording of sensory data, an individual has less desire to touch the environment, and he interacts with the environment just with his feet and using visual aspect.

• **Qualitative assessment of the sense scape components in the Qazvin market**

The use of spider diagrams in the previous section

was the only way to give multisensory values to spaces. In order to evaluate the attributes and power of each of them in the environment, there is a need to measure each of the stimuli in a two-dimensional opposite. Therefore, at this stage, the space is evaluated by registering the stimulus in space based on the two-dimensional quality such as strong or weak, soft or hard, normal or abnormal, etc. Depending on the qualitative conditions of the time of stimuli, each stimulus can be unique or repetitive at a specific time. Therefore, in the case of a repetition in the registration and valuation, the correct average is considered.

To examine each of the sense scape components, they are evaluated in a range of two dominant traits that describe the traits and the strong or weak presence of a stimulus in space. This strong or weak presence is a qualitative criterion of space, and no quantitative measures are defined for it. [Fig.s 13 to 17](#) show a qualitative assessment of each of the stimuli from the users' point of views. The reason for this is the lack of certain quantitative criteria for assessing some senses such as touch and smell. Also, assessing such space allows one to examine the impact of a stimulus beyond its physical strength and weakness, and necessarily the intensity of a stimulus is not a reason for its impact. For example, an unpleasant smell, though weak and in the background, is described much more annoying than an inappropriate and ugly facade. The stimuli that are presented below are those stimuli that have been repeatedly reported during a period of time by the statistical population during the study of the Qazvin bazaar, and naturally, there may be temporarily other stimuli in the bazaar. In the following section, the stimuli registered by the statistical population are listed in [Table 2](#).

Diagrams clearly describe the qualitative state of the sensory dimensions of space in the Qazvin Bazaar from the users' point of views. Graph 11 illustrates the visual dimensions in the bazaar. As seen in the diagram, most of the visual

components of the Qazvin bazaar are "beautiful" and in the same situations in terms of intensity.

On the other hand, undesirable options are evaluated strong, which seems to be due to the existence of visual disturbances caused by advertising and roof structures in various parts of the market, especially in the forage-sellers Rasteh.

[Fig. 14](#) represents the qualitative assessment of the smell's scape in the Qazvin bazaar. It seems that from the users' point of views, most of the smells in the market are attractive due to the variety of uses, and they are placed in the class of desirable and strong smells and create an attractive environment for users. In the study of the frequency of undesirable smells, it was found that the smell of cigarettes, waste and sewage in the forage-sellers Rasteh caused a bad situation in terms of the smell's scape.

[Fig. 15](#) represents the qualitative assessment of soundscape in the Qazvin bazaar. An analysis of this diagram indicates that most of the normal components are weak and abnormal components are strong. Most of the annoying sounds described by the users are related to the shoppers who work in this part of the bazaar. The next annoying sound described by most of the users is related to the caterers' voices who work across the market. In this scape, people's humming can be considered as a background sound.

Two [Fig.s 16 & 17](#) are related to the tacti escape and thermals scape. Two opposite words are used just to simply describe the stimuli. The words "soft" and "hard" are chosen to describe tactile descriptors because they are easily understood. Otherwise, words such as (rough and delicate) and (polished and textured) can also be used to describe the tacti escape. What is important about the tacti escape is the proper mixing of opposite traits together and creating diversity in the environment. The thermal and touch dimensions are very similar in this regard, except that the tactile stimuli are often fixed and the thermal stimuli are subject to climatic conditions. What's discussed about ambient

Table 2. The recognition of Sensory Planes existing in the different sense's cape components in the Qazvin Bazaar. Source: Authors, 2018.

Senses cape					
	Visual	Smell	Thermal	Sound	Tactile
Station 1	The variety of products, the façade of chambers, the visual disturbances	Chicken, fish, fruits shops	The temperature differences in rasteh, entrances and yards	The music, vehicles, sellers' voices and people's humming	The variety of products, furniture
Station2	The exhaustion of ceiling, the variety of products, the variety of ceiling coverage	The smell of fruits, the wall humidity	The temperature differences in rasteh, entrances and yards	Sellers' voice, people's humming, players	The variety of products with different textures, pavement
Station3	The façade of Imam Sadiq (as) mosque, the penumbra in ceiling, the variety of products, the variety of entrances, the waste	Perfumery, wastewater, cigarette	The temperature differences in rasteh, entrances and yards	Sellers' voice, people's humming, sound of Adhan	The shade on walls, the variety of products with different textures
Station4	The visual disturbances in ceiling, the penumbra in ceiling, the façade of Martyr Sales mosque	Dried fruits, dairy products	The temperature differences in rasteh, entrances and yards	Sellers' voice, people's humming, sound of Adhan	Th eshade on walls, the variety of products with different textures
Station5	Visual disturbances and advertising, the exhaustion of body, various ceiling coverage, sunlight	Protein products, birds, kebab	Sunlight, the temperature differences in rasteh, entrances and yards	Sellers' voice, people's humming, blacksmith shop, sound of birds	The thatch wall, the rhythm of ceiling, wind
Station6	The rhythm of ceiling and arches	Restaurant, the smell of perfumery	The temperature differences in rasteh, entrances and yards	People's humming, caterers' voice	The change in wall texture, the shade and the light on ceiling
Station7	The variety of entrances, dome, ornaments, type of body	Cigarette, the smell of products in perfumery, wall humidity	The temperature differences in rasteh, entrances and yards	People's humming, caterers' voices	The full and empty spaces in ceiling, the various products with different textures
Station8	Penumbra on ceiling, kind of body, Vestibule, the variety of products, the rhythm of bodies	Perfumery, the smell of products in perfumery	The temperature differences in rasteh, and space of vestibule	Sellers' voice, people's humming	The full and empty spaces in ceiling, the variety of product with different textures
Station9	Trees and grass, the coordination of products, fountain, iwan, sunlight, empty and full spaces	The smell of grass and trees, smoke of vehicles, fast food	Temperature differences in rasteh, entrances and yards, fountain, sunlight, shade of trees	People's humming, the sounds from coppersmiths, sellers' voices, players	Trees and grass, the variety of products with different textures, fountain, wind
Station 10	Doem, iwans, illumination, pond, trees, rhythm, ornaments	Trees and grass	Temperature differences in rasteh, entrances and yards, fountain, sunlight	The sound of Adhan (great reduction of sound variety in the environment)	The shade of portico, trees and grass, fountain, wind

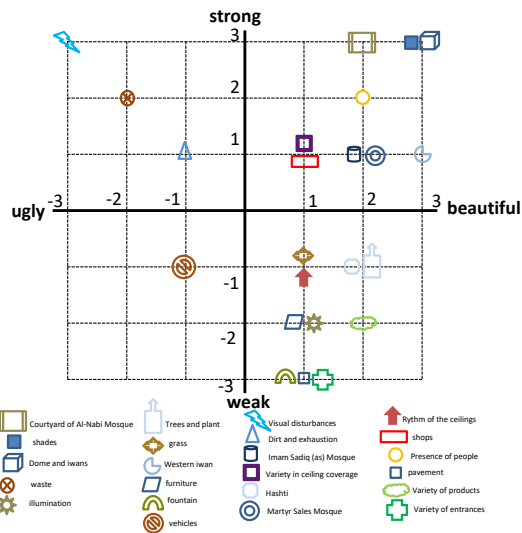


Fig. 13. Qualitative assessment of planes of visual stimuli. Source: Authors.

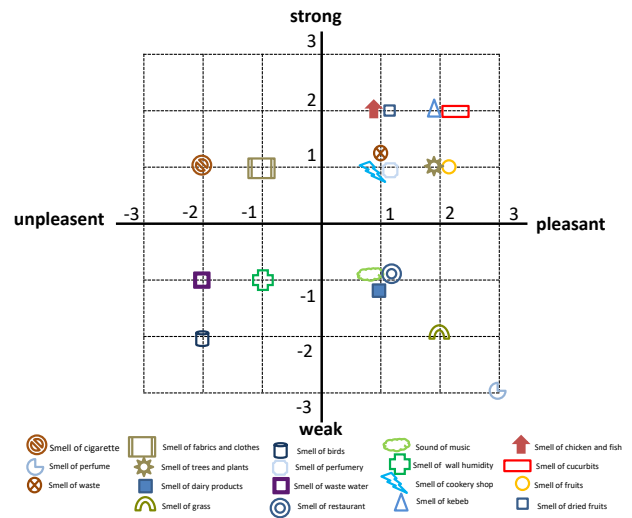


Fig. 14. Qualitative assessment of planes of chemical stimuli. Source: Authors.

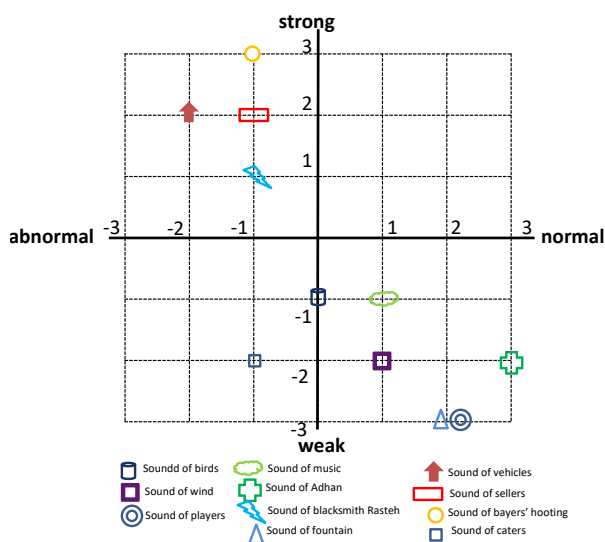


Fig. 15. Qualitative assessment of planes of sound stimuli. Source: Authors.

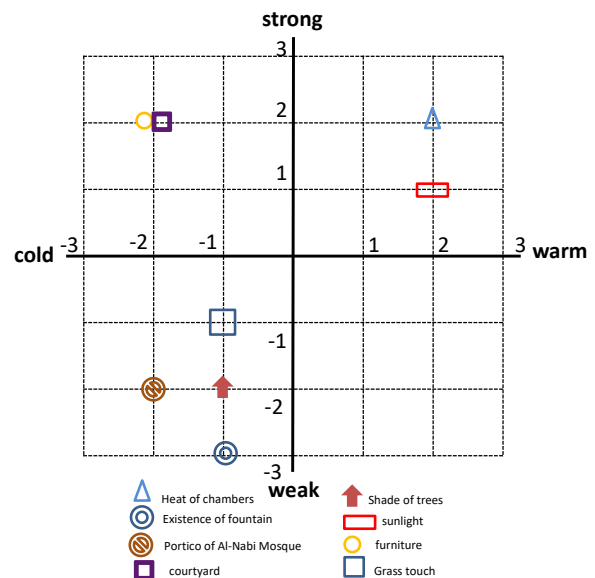


Fig. 16. Qualitative assessment of planes of thermal stimuli. Source: Authors.

temperature and thermal stimuli is to maintain the climatic comfort of the environment.

Conclusion

Looking at old parts of the city, it is found that each of these parts was a multisensory place at its time. Covered bazaars that are valuable relics from the pre-modern era can be compared to modern shopping malls and shopping centers. Covered bazaars contained all sensory stimuli.

The division of guilds in these bazaars has led to less interference between the sensory domains. The covered space of these bazaars, which connects with a non-enclosed environment such as squares, makes the temperature difference in this space tangible in different seasons. The combination of light and the rhythms of the bodies evokes movement, even in the bodies of these places. The rhythmic sound of the hammer used by coppersmith, the smell of food and spices and colorful fabrics in draperies create

an admirable symphony of various senses that are not comparable with those in contemporary passages. The use of air conditioners, music, and intense light reflected by showcases are just the sensory stimuli in contemporary passages, which make these places fictitious and tedious in such a way that none of the existing stimuli can represent activities in space. The identity of the senses cape of the cities has been diminished, and this is one of the problems made in our urban areas by the advent of modernism and minimalism. The continuous investigation of Qazvin bazaar over a period of one month showed that there is a mutual relationship between activity and sensory changes, and each activity has its own unique sensory space. The evaluation of sensory stimuli indicated that sound and chemical stimuli were two stimuli affecting the sensory perception of the bazaar. These two stimuli had the most changes throughout the day, and changes in them results in changes in sensory identity of the space. In contrast, visual and tactile stimuli were relatively stable stimuli in space. The reason for the fact can be attributed to the physical nature of these stimuli.

The qualitative assessment of the descriptors of the senses cape components also showed that most of the visual components in the Qazvin bazaar are beautiful and in terms of intensity, they are in the same situation. It was found that most sensory descriptors are in the form of two visual and chemical components, which heavily affect the bazaar. The findings of this research are consistent with the findings of previous studies (Soleimani; Aftab; Asadi & Majnoony., 2017; Barati and Kakavand, 2013; Lotfi & Zamani, 2015). What is common among these findings is that senses cape components are directly effective in better perception of the environment, and also provide an opportunity for other behaviors and qualities. The presence of these sensory qualities makes people use that space more. The existence of five senses cape components in a man-made environment, such as traditional and old bazaars,

creates “identity” and can play an important role in “urban and architectural sustainability” of urban spaces.

In general, it can be argued that sensory symbols and sensory stimuli in the bodies of cities and architectural spaces, can be effective in perception and recognition of space. The isolation of our senses in cities and architectural spaces has resulted in forgetting of our senses in daily life and also, they gradually lost their role in the social life of urban spaces. The sensory symbols may have the greatest effect on the perceptual aspects of space, but it is impossible to ignore the effect of the sensory dimensions of space on social, human, and aesthetic dimensions. Perhaps an obvious example of this can be seen in developing a sense of belonging in the historical bazaars as compared to new commercial centers. A comparative study between them shows that aesthetic aspects are not limited to visual dimensions and their scope can be developed and they can be replaced by the term “sensory pleasure”. This pleasure includes more vast dimensions of visual aesthetics and can be used in the form of design patterns for urban spaces, especially new commercial centers.

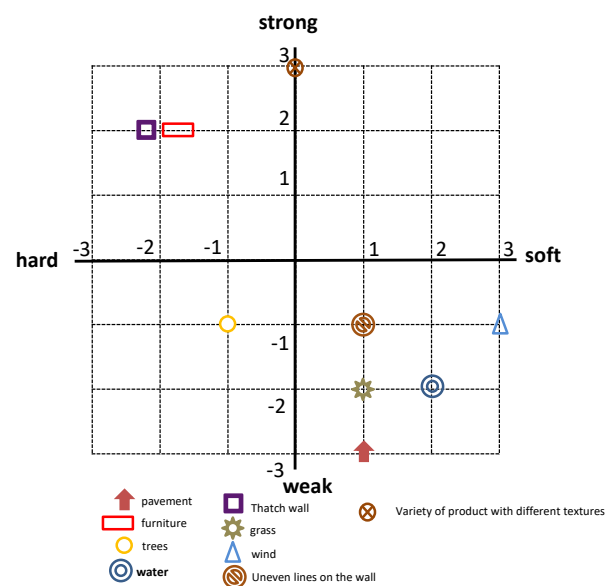


Fig. 17. Qualitative assessment of planes of tactile stimuli. Source: Authors.

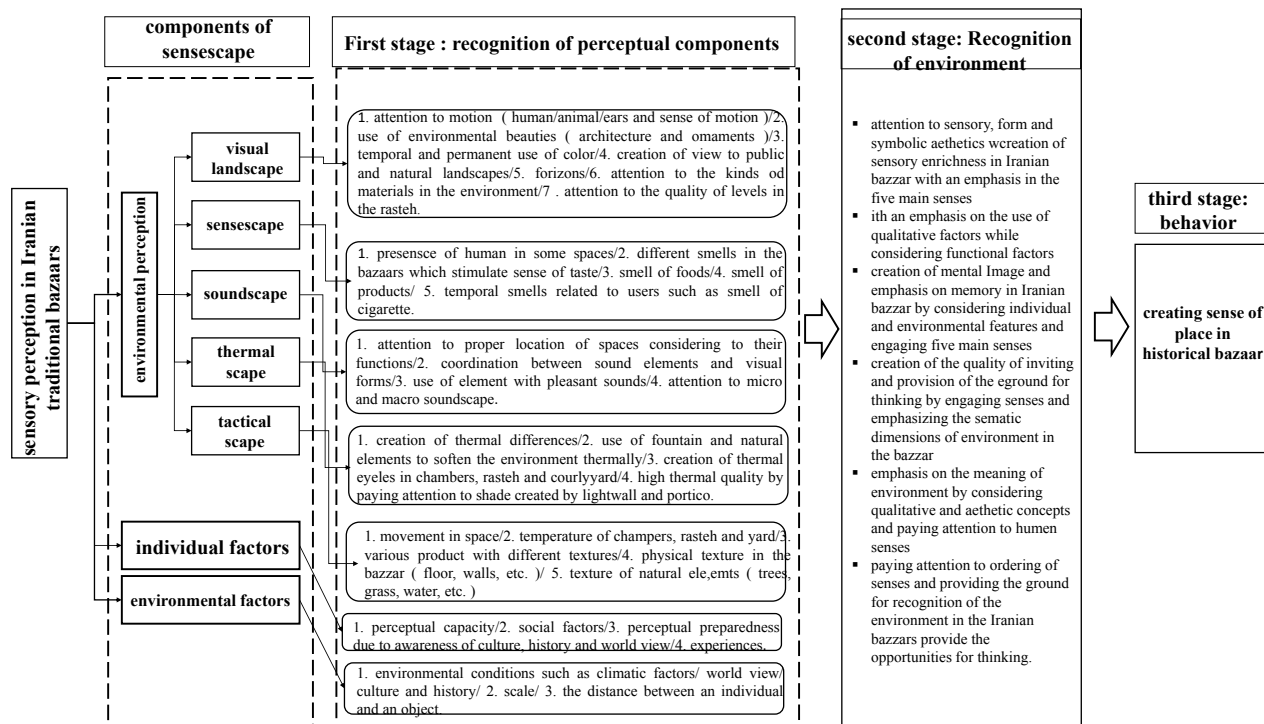


Fig. 18. Sensory perception model in Iranian traditional bazaars according to the assessment of sensory descriptors of space. Source: Authors, 2018.

Endnote

1. Rasteh Bazaar: It refers to the main passageway with shops of the same guilds.

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