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Explanation of functional factors affecting the success of public spaces and providing a model for assessing success through its functional dimension (Case study: Imam Khomeini Street, Tabriz, Iran)

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Abstract

The conditions that different cities including Iranian cities are confronted with makes the creation of successful public spaces a necessity. It is clear that for creating suitable public spaces, first one should understand the factors influencing the space and simultaneously find solutions to spatial problems through understanding the environment. In order to arrive at the factors that influence the success of space, important theories about this subject matter were reviewed. These sources include writings by White, Montgomery, Jacobs, Gehl, Carr, Oldenburg and the experience of renowned international institutes. Finally a model for space evaluation based on place game model of PPS[1] institute was presented. The methodology of this research is testing and verifying theory and to do this the Correlation Test was used. At first, the factors influencing the success of public spaces are categorized as "comfort", "activity", "access", and "socialability". These factors were deducted from the place model and place game checklist of PPS institute and the theoretical framework presented in this paper. Then, by means of critical observation, questionnaires, the Llewlyn Davies scale and field survey techniques, data was collected to satisfy the requirements of the place evaluation model. In order to analyze the spatial success of Imam Khomeini Street in Tabriz, the interpolation model of GIS software was used. The result showed that Abresan Street is the most successful section with Saat, Mansoor and Golestan sections following respectively. The results of the investigation shows that from the highlighted factors "comfort" and "image" are the most important requirements for the success of public places.

Keywords: *Successful public space, Function, Access, Socialability, Activity, Image.*

1. Introduction

Public space is a mix of the physical milieu with various activities whose purpose is to show the social life visible for all [1]. All parts of an urban fabric which are accessible physically and visually for all are considered as public space. They are the most important parts of towns and cities in which the greatest amount of contact and interaction among people takes place [2].

The development of public spaces will depend on the existence of public life. The forces that shape public life can bring a broader understanding of the factors that influence the vitality of public spaces. These general forces are: (1) the environmental characteristics of the public space (which include climate and topography), (2) socio-cultural characteristics of the community, (3) functional and physical characteristics of public spaces, (4) political and (5) economic (6) recreational and (7) the health needs of society [3].Urban planning and design in a variety of scales can have an effect on the political, economic and recreational patterns through affecting functional and physical characteristics of public space.

This paper focuses on the functional dimension of urban design, which involves how places work and how urban designer can make better places. The social usage and visual traditions of urban design thinking has a functionalist perspective. The former concerned the functioning of environment in terms of how people used it, while in articles, the human dimension was often abstracted out and reduced to aesthetic or technical criteria such as traffic follow, access, or circulation [4].

In public spaces, the presence of users is not the only sign of success. A successful public space attracts different levels of activity. Whyte reminds us that: "the best-used places are sociable places, with a higher proportion of couples than you find in less-used places, more people in

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groups, more people meeting people, or exchanging goodbye". A high proportion of people in groups is an index of selectivity. When people go to a place in two or three or rendezvous there, it is most often because they have decided to. These sociable places aren't less congenial to the individual. In absolute numbers, they attract more individuals than do less-used spaces.

The best-used places also tend to have a higher than average proportion of women. "If a plaza has a markedly lower than average proportion of women, something is wrong. Where there is a higher than average proportion of women, the plaza is probably a good one and has been chosen as such [5]."

Jan Gehl in his book "Life between buildings" presents social activities in public spaces as the most important factor for a successful public space. He believes that something more than architecture and planning is needed for extending these kinds of activities. In fact, physical framework does not have a direct influence on the quality, content, and intensity of social contacts. Gehl mentions that social activities mainly relate to the common interest in economy, politics and ideology between users of public space, but architects and planners can have an effect on the possibilities for meeting, seeing, and hearing people - possibilities that both take on a quality of their own and become important as background and starting point for other forms of contact [6].

According to Gehl, a successful space has a high range of social activities in different intensities and at least users have eye contact [6]. There is a direct relation between necessary, optional and social activities with quality of outdoor areas. This means that when the quality of outdoor areas is good, optional activities occur with increasing frequency. Furthermore, as levels of optional activity rise, the number of social activities usually increases substantially [6].

In successful spaces, the spectrums of social and optional activities are more predictable. Repetition of use and duration of staying in space has a direct relation to the success of space. Increase of staying time and repetition of the use of space affect the frequency of meeting and speaking and result in the increase of social activities [6]. Finally, as Montgomery explained, successful urban places must combine quality in three essential elements: physical space, the sensory experience and activity [7].

2. Concepts, Theories and Theoretical Framework

According to Gehl, each improvement in the quality of city through giving more room to a much wider range of human activities, affects the number of users of public spaces passively and actively. Within certain limits - regional, climatic, social - it is possible to influence how many people and events use the public spaces, how long individual activities last, and which activity types can develop. On the other hand, for Montgomery, it is relatively straightforward to think of a successful place, and to experience it as such, but it is much more difficult to discern why it is successful, and whether similar success can be generated elsewhere [7].

According to PPS, 'the community is expert'. People have an intuitive sense about what they need and we should try to provide a structure to help them find out what it is [8]. In order to become the expert at what they call 'ergonomic of the place' and to understand what makes street corner and plazas work, PPS learned to closely watch 'how people come into a place, what they look at, where they stop'. For those like Whyte's they use time-lapse photography and other methods to quantify pedestrian and automobile traffic pattern, but much of what can be learned about the place is through simple observation [8].

"PPS" like Gehl believes that for creating a successful public space, there must be somewhere to go and something to do, so success happens when the spectrum of human activities is presented in space. Based on a synthesis of research and ideas on the use and design of public spaces, Car et al. (1992) argue that, as well as being 'meaningful' (i.e. allowing people to make strong connections between the place, their personal lives, and the larger world), and being 'democratic' (i.e. protecting the rights of user groups and providing for freedom of action), public spaces should also be 'responsive' – that is, designed and managed to serve the needs of their users.

Among the human needs that John Lang (1987) argues in his book "Creation of Architectural Theory", he identifies five primary needs that people seek to satisfy in public spaces: 'comfort', 'relaxation', 'passive engagement with the environment', 'active engagement with the environment', and 'discovery'. Good places frequently serve more than one purpose [4]. It is important to examine needs, not only because they explain the use of places, but also because use is important to success. Places that do not meet people's needs or serve no important functions for people will be underused and unsuccessful [1].

Whyte by addressing the similar results of Jan Gehl's study of pedestrians in Copenhagen and Mattew Ciolek study of an Australian shopping center, concludes that despite the cultural and ethnic difference, the strongest similarities are found among the world's largest cities. The people in these cities tend to behave more like their counterparts in other world cities than like fellow nationals in smaller cities [5]. By considering the scale variable, the factors that make a plaza or small space successful in one city also work in others [5].

Therefore, having these points in mind, the theoretical framework of this research is applied for the case study, which is the most important street in the city of Tabriz. Based on the findings of the literature review, there are many factors that influence the success of public space and they relatively depend on researchers' attitude and expertise. In this section, according to the findings of the most important theorists of public space such as Whyte, Montgomery, Jacobs, Gehl, Car, and Oldenburg, as well as the experience of the famous international institute PPS, the influencing factors for a successful public space are categorized into four key attributes "comfort and image", "access and linkage", "uses and activity", and "sociability". Based on these factors. the questionnaire is produced. The conceptual framework of this study is shown in the table below:

Table 1 Introducing the factors affecting the success of public space

Access and Linkages	Visual access	Space visibility from distance (Whyte [5], Carr [1], PPS [9])	What is the level of street frontage visibility from a distance?
		The space should be the same level as the street level, or at most 3 feet higher or lower. (Whyte [5], Gehl [6])	How much of the space is visibile according to location of cars along the street?
		Space visibility from adjacent buildings (eyes on the street) (Whyte [5], PPS [9], Jacobs [10])	How clear are the information boards?
		Space visibility according to location of cars in adjacent of street? (Gehl [6], PPS [9])	To what extent do you have visual control over the surroundings?
		Active street Frontage& permeability (Whyte [5], Gehl [6], Montgomery [7])	
	Physical access	Varity of transportation options provide access to the place [15]	Do the roads and paths through the space take you where you actually want to go?
		Connectivity and continuity of sidewalks (PPS [9])	
		Function of space for people with special needs (Whyte [5], PPS [9])	Can you use a variety of transportation options – bus, train, car, bicycle, etc. - to reach the place?
		The linkage between street and space (Whyte [5], Jacobs [10])	
		Overall design relate to people's use (Whyte [5], PPS [9], Gehl [6])	Are there bus stops and taxi stations available?
	Economical access	Space accessibility for all types of economic classes (offering service of different kinds at varying prices and degrees of quality) (Montgomery [7], Oldenburg [11])	Are there space services accessible for all types of economic classes?
	Psychological access	Sense of place (Montgomery [7])	What is the level of your place attachment in this space?
			Do You immediately understand the changes in this street?
	Symbolic access	Symbolic limitation or attraction (Carr [1])	How attractive is the street facade?
Uses & Activities	Variety of primary land uses, including residential, Mixed use & Mixed housing (Gehl, Montgomery [7], Jacobs [10])		
	Varying opening hours and stimulating the evening economy (Montgomery [7], Jacobs [10], Oldenburg [11])		Is there any unique features in this street in comparison to similar streets? If yes, please explain?
	Multi-function public space (Gehl [12])		
	Uniqueness of activities (Whyte [5], Gehl, PPS [9])		
	Specialness activity (Whyte [5], PPS [9])		
	Wide spectrum of social, economic and cultural activities (Whyte [5], Gehl [13], Montgomery [7], PPS [9])		Are there any choices of things to do for attracting all members of your family?
	Retail sales (Whyte [5], PPS [9])		
	Holding of event and activities (PPS [9])		Can the diversity of activities attract and amuse all people?
	Availability of cinemas, theatres, wine bars, cafes, pubs, restaurants and other cultural and meeting places (Montgomery [7], Whyte [5], Oldenburg [11])		How much this street keeps its vitality after the evening?
	Availability of spaces, including gardens, squares and corners to enable people-watching and other activities (Montgomery [7])		How frequently do you use the cafes and parks in this street?
	Third place accessibility (Oldenburg [11])		
	Property values (PPS [9])		
	Rent levels (PPS [9])		
	Local business ownership (PPS [9])		
Sociability	Mix of ages, ethnic groups and cultural groups (Gehl [12], Whyte [5], PPS [9], Jacobs [10], Oldenburg [11])		Do you meet your acquaintances along this

		Volunteerism (PPS [9])		street by chance**?**
		Welcoming and stranger receptivity (Montgomery [7], PPS [9])		Do you usually make your appointment with acquaintances along this street**?**
		Level of contacts (Montgomery [7], PPS [9], Jacobs [10], Oldenburg [11])		
		Presence of people across different times of the day and nights (PPS [9])		Do you usually choose this place for talking with your friends**?**
		Pride (PPS[9])		Do you have a sense of pride for the space? In other words can you proudly tell others about the positive characteristics of this space **?**
				Is there any opportunity for users to communicate with strangers**?**
				Does this space make you feel good at first glance?
Comfort &Images	Sense of safety	Protection against traffic and accident (PPS [9], Gehl [12])	Traffic accident Fear of traffic Other accidents	Do you feel safe when crossing the street?
		Protection against crime & violence (feeling of safety) (Jacobs [10], Gehl [12])	Lived in/ used Street life Street watchers Overlapping functions- in space & time	Do you have to spend a lot of time for crossing the street? Do the presences of undesirable groups & drug users disturb your feeling of safety?
		Protection against unpleasant sense experiences (Whyt e[5], Gehl [12])	Wind / draft Rain / snow Cold / heat Pollution Dust / glare / noise	Do the presence of thieves and gangs disturb your feeling of safety?
			Appropriate trees & planting	Do you feel safe in the evening after the sunset?
	Comfort	Possibilities for walking (Whyte [5], Gehl [12], PPS [9])	Room for walking Untiring layout of street Interesting facades No obstacles Good surfaces Using ramps instead of stairs Avoid making stairs & different level as much as possible	
		Possibilities for standing / staying (Whyte [5], Gehl [12])	Attractive edges - "edge effect" Defined spots for staying Supports for staying	Can you feel relax due to existing noise? Does the space present a fresh and vital atmosphere?
		Possibilities for sitting (Whyte [5], Gehl [12], PPS [9])	Zones for sitting Maximizing primary and secondary sitting possibilities Benches for resting	Is the presence in this space memorable for you? Is the surface of the sidewalk good for walking?
		Possibilities for seeing (Gehl [12])	Seeing-distance Unhindered views Interesting views	Is this space clean? Are there any possibilities for sitting, standing/staying in the space?
		Possibilities for hearing / talking (Whyte [5], Gehl [12])	Lighting (when dark) Low noise level Bench arrangements "talk spaces"	
		Possibilities for play/ unfolding/ activities (Gehl [12])	Invitation to physical activities, play, unfolding & entertainment-day and night and summer and winter	
		Amenities (Whyte [5], PPS [9])	Public telephones, information kiosks, drinking fountains.	

Enjoyment	Scale (Montgomery [7], Gehl [12])	Dimensioning of building & space in observation of the important human dimensions related to senses, movements, size & behavior	Do you find this space beautiful (architecturally)?
	Possibilities for enjoying positive aspects of climate (Whyte [5], Gehl [12])	Sun / shade Warmth / coolness Breeze / ventilation	
	Aesthetic quality / positive sense-experience (Whyte [5], Gehl [12])	Good design & good detailing Views / vistas Trees, plants, water	
	Meaning (Montgomery [7])	Memory representation (memorable space)	

3. Research Methodology

The main method of this research is testing theory, because of its experimental-theoretical orientation for identifying the most effective factors in the success of public spaces. The research principals of this study are presented in following tables:

Table 2 Introduction of research principals

Fundamental	Main goal	Identifying the factors influencing the success level of Imam Khomeini street.
	Question	What factors and indices are influencing the level of success in Imam Khomeini street in Tabriz.
	Hypothesis	It seems that among the influencing factors, image and comfort are the most important factors
	Case study	Four sections of Imam Khomeini St in Tabriz

Aftert identifying the main goal, question and hypothesis in this study the methodology of examiming the hypothesis is presented in Table 3:

Table 3 Research steps for testing the hypothesis

First stage	Goal	Assessing the level of success in different sections of Imam Khomeini st in Tabriz
	Methodology	Evaluation research method for assessing the success of public space as introduced in Table 4
	Data collection means	Deep observation. Questionnaire. Interview
	Analysis method	Excel software The checklist for evaluating the success level of the street Assessing the level of success at four sections of Imam Khomeini street through a questionnaire
	Analysis process	GIS software Extraction of descriptive data from questionnaire for analyzing by excel in order to fill in the checklist criteria Evaluation of success, according to given model Use of GIS software for geo-referencing the location of the questionnaire data
	Result	Identify the relatively successful sections of the Imam St in Tabriz
Second stage	Goal	Explanation of the most important factors influencing the success of Imam Khomeini street by using the results from the first stage of the study for verification of the hypothesis
	Methodology	Correlation test
	Data collection means	Questionnaire
	Analysis means	Spss software Excel software
	Analysis method	Using Spearman test between success factors and level of success at four different sections of Imam Khomeini st.
	Result	Identifying the most important factor influencing the success of Imam Khomeini st.

4. Selection of Case Study

By considering the type of public space, our case study was selected in a way that in addition to including varied functions it could provide us a comparison for the results and explanation of the most important factors affecting the success of public space. Such space must primarily include the potential for the absorption of people as an important precondition for success. The historic, cultural, commercial and official axes of Imam Khomeini st as the most important and affective east-west axes in Tabriz city with the most important historic buildings, main neighborhoods, railway station, Qonqa square, Shahnaz st, Tarbiat walk way, Shahrdari historical building, Kabood mosque, Abresan commercial st, Tabriz university and the most important cultural centers and historical residential complex provided us with the required features. It has to be noted that this street has been one of the most attractive and busy places in Tabriz since the Qajar period.

5. Sample Size and Sampling Method

Since the statistical population and sampling method size in this research is unlimited and the objective is the selection of samples, without any particular characteristic, the method used in this research has been simple random sampling. In order to obtain the sample size, the number 332 is calculated based on the maximum acceptable error at 95% confidence level[2]. In order to collect the relevant data, 34 questions including 10 indices in the main four categories were selected and presented in five optional of likert. Descriptive background parameters in this questionnaire are shown in the following table. From 332 interviewees, 29% were in Imam Khomeini st., 25% in adjacent neighborhoods and 46% in other districts of the city.

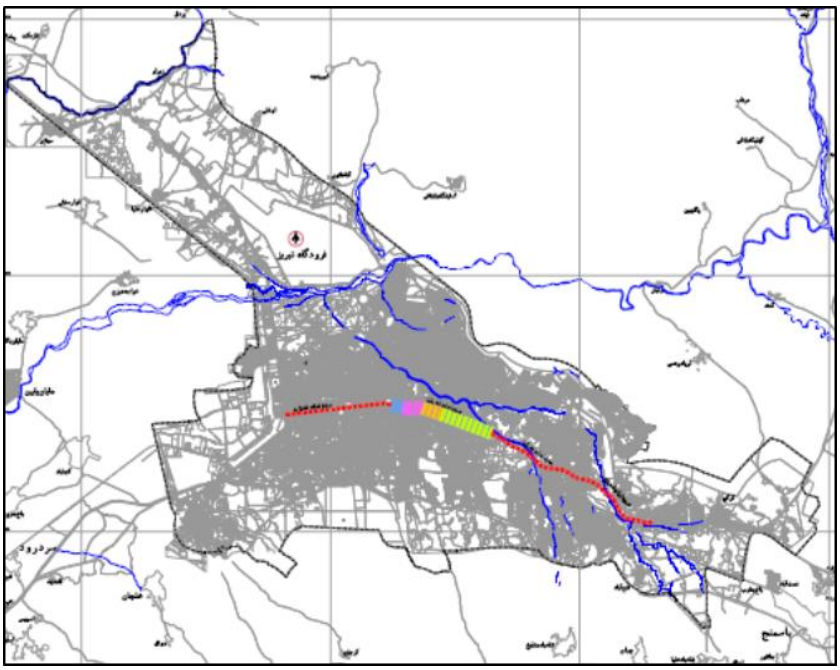

Fig. 1 Location of Imam Khomeini street (case study) in the map of Tabriz

Table 4 Descriptive background parameters of the questionnaire

Marital status		Education level			Period of residence			Gender		Age group			
Married	Single	BA & more	Junior college diploma	Secondary school or no diploma	More than 10 years	2 to 10 years	Less than 2 years	Native	Male	Female	More than 35	35-55	18-35	14-18
27%	73%	60%	34%	6%	8%	7%	5%	80%	66%	34%	17%	22%	48%	13%

6. Examining the Hypothesis

For the evaluation and comparison between the success level of four sections of Imam Khomeini st. first, the place evaluation checklist were completed by using critical observation, questionnaire, Llewlyn Davies's scale and field survey techniques. In order to spatially analyze the success level of Imam st., interpolation model at GIS software was also used. After assessing the success level between four sections of the site, the Spearman correlation test was conducted to recognize the most important factors that influence the success of this street.

6.1. First stage: evaluating the success rate among four sections of Imam Khomeini street

Imam Khomeini street is one of the most attractive and busy places in Tabriz and large numbers of people use it everyday. Considering this fact, evaluation and comparison of four sections of Imam Khomeini street can help us explain and define the most important factors of its success. It shoud be mentioned that the street is divided by junctions and squares into four sections, each of which has different types of social and physical activities.

6.1.1. The first method: success evaluation based on proposed place evaluating model

After answering and attributing the score to model questions based on questionnaire, field survey and deep observation were also conducted. In order to prioritize each section according to overall success and success in each criteria, as "PPS" institute proposed in the "place game" model, the statistical indices (mode and average), has also been calculated. The calculated numbers only reflect the condition of each section relative to the others.

Table 5 Success evaluation based on the proposed Place Evaluating Model at four Sections of Imam Khomeini Street

Criteria		Qualitative questions	Data collection means	Abresan	Mansoor	Saat	Golestan
Sociability		Level of voluntary activities in space	questionnaire	4	2	3	1
		Level of contacts in space	questionnaire	4	3	2	1
		Attraction of space for being selected	questionnaire	4	2	3	1
		Level of Welcoming & strangers receptivity	questionnaire	3	4	2	1
		Level of being proud about space	questionnaire	3	4	2	1
		Average of sociability score (sum of scores/5):		3.6	3	2.4	1
		Mode of sociability score		4	4&2	2	1
Comfort & images	Feeling of safety	Feeling of safety due to traffic accident	questionnaire	4	3	1	2
		Possibility of crossing the street in short time	questionnaire	1	3	4	2
		Possibilities of safe staying at street refuge in the time of crossing	observation	1	1	1	1
		Level of pedestrian priority at street	observation	4	2	3	1
		Level of Feeling safety due to gang & thieves	questionnaire	3	4	2	1
		Level of Feeling safety due to undesirables	questionnaire	3	4	2	1
		Level of Feeling safety after evening	questionnaire	4	3	2	1
		Possibility of street for protection against bad weather	observation	4	3	2	1
		Plants compatibility with climate	observation	0	0	0	0
	Comfort	Flat sidewalk without stairs	observation	4	2	1	3
		Availability of benches for rest	observation	3	4	2	1
		Quality of sidewalk coverage	questionnaire	4	2	1	3
		Possibility of Sitting or staying at edges	observation	4	3	2	1
		Availability of suitable places for sitting which are designed for other main function	observation	4	3	2	1
		Level of feeling comfort & satisfaction	questionnaire	4	2	3	1
		Level of street lightening at night	observation	4	2	3	1
		Possibilities for unhindered views	questionnaire	4	1	3	2
		Low noise level for hearing and talking	questionnaire	4	3	2	1
		Availability of suitable amenities (public telephone, information kiosk, recyclebin, …)	observation	4	3	2	1
		Level of street cleanness	questionnaire	4	3	1	2
		Level of memory representation at street	questionnaire	1	4	3	2
	Enjoyment	Level of street elements uniqueness (bus station,…)	observation	4	3	2	1
		Beautiful facade due to architectural-orientation	observation	3	4	2	1
		Beautiful vistas (fountain, sculpture,…)	observation	3	4	2	1
		Human scale of street without the feeling of float or enclosure	observation	0	0	0	0
		Average of comfort & image score (sum of scores/**25**):		3.4	2.9	2.1	1.4
		Mode of comfort & image score		4	3	2	1

Access & linkage	Visual access	Level of Space visibility from distance for walking	questionnaire	4	3	2	1
		Level of Space visibility according to location of cars in adjacent of street	questionnaire	4	2	3	1
		Dominate over surrounding	questionnaire	4	1	3	2
		Level of Space visibility from adjacent buildings	observation	4	2	3	1
		Level of Active frontage	Llewlyn Davies's scale	1	2	4	3
		Level of information board clarity along street and intersections	questionnaire	4	2	3	1
	Physical access	Connection method between sidewalks and adjacent space	observation	3	2	1	4
		Level of sidewalk connectivity and continuity	questionnaire	3	2	1	4
		Varity of transportation option for use	questionnaire	4	1	2	3
		Availability of Public transportation station	questionnaire	4	3	1	2
		Level of facilities for pedestrians with disabilities	observation	1	1	1	1
	Psychological access	Level of place attachment sense	questionnaire	4	2	3	1
		Level of understanding the space changes	questionnaire	4	2	3	2
	Economic access	Level of place accessibility for all types of economic classes	questionnaire	1	4	3	2
	Symbolic access	Level of symbolic limitation of space	questionnaire	4	3	2	1
		Average of access & linkage score (sum of scores/15):		3.3	2.1	2.3	1.9
		Mode of access & linkage score		4	2	3&4	1
Uses & activity		Level of evening & night activities	questionnaire	4	4	2	3
		Liminal space for public communication (café, ..)	questionnaire	4	2	3	1
		Level of mixed use	Field survey	4	2	3	1
		Domination of retail (if more than 50% of land uses dedicated to retail street gets 4 score)	Field survey	4	4	4	4
		Level of Holding event and activities at street	observation interview	2	1	4	3
		Presence level of street venders	observation	4	2	3	1
		The availability of cinemas, theaters & restaurants	observation	1	1	1	1
		the availability of spaces, including gardens, squares and corners to enable people-watching and other activities	observation	3	4	2	1
		Spectrum of different activities	questionnaire	4	3	2	1
		Existing transition base in social, economic & cultural fields	Observation interview	4	2	3	1
		Existing of unique activity at street	questionnaire	3	2	4	1
		Existing of Special character at street	questionnaire	3	2	4	1
		Average of uses and activities score: (sum of scores/12)		3.3	2.4	2.9	1.6
		Mode of uses and activities score		4	2	3	1
		Average of average scores in each criteria:		3.4	2.6	2.4	1.7
		Mode of all score		4	3	2	1

According to the results of the evaluation, the Abresan section has the most successful space followed by Mansoor, Saat and Golestan sections respectively.

6.1.1.1. Explanation the method of filling the place evaluation model questions according to questionnaire, field survey and deep observation

• Questionnaire

In order to clarify the method of place evaluation by using the questionnaire, table number 6 is presented. In this table it is shown how marks are given to the criteria of street frontage visibilities.

Table 6 Level of street frontage visibilities for the different sections of the street

Street name		Not at all	Fair	Average	Good	Excellent	Total	Score mean	score in model
		1	2	3	4	5			
Abresan	frequency	2	5	38	20	10	75	3.41	4
	score	2	10	114	80	50	256		
Mansoor	frequency	1	11	38	37	3	90	3.33	3
	score	1	22	114	148	15	300		
saat	frequency	1	22	34	18	8	83	3.12	2
	score	1	44	102	72	40	259		
Golestan	frequency	2	23	34	13	5	77	2.95	1
	score	2	46	102	52	25	227		

According to table above, Abresan street with 3.41 has the highest level of street frontage visibilities among others and its score in Place Evaluating Model is 4.

- **Field Survey**

For example, the level of mixed use activities in four streets was evaluated by the data of table 7.

Table 7 Variation of commercial land use at four sections of Imam Khomeini street

Imam	Golestan		Saat		Mansoor		Abresan	
type	percentage	type	percentage	type	percentage	type	percentage	type
102	42%	42	57%	58	40%	41	66%	67

The result showed that Abresan section has the highest level of mixed use activities, Saat, Mansoor and Golestan were in next steps respectively.

- **Llewlyn Davies's Scale**

Table 8 Using Llewlyn Davies's scale to evaluate the performance of designs according to the intensity of active frontage

Street name	Golestan	Saat	Mansoor	Abresan
More than 15 premises every 100 m	3	4	4	1
A large range of functions/land use	2	3	3	1
More than 25 doors and windows every 100 m	3	4	4	1
No blind/blank facades and few passive ones	3	4	4	1
Much depth and relief in the building surface	1	2	2	4
High quality materials and refined details	1	3	3	4
Total score	13	20	15	20

According to this table -in Place Evaluating Model- Abresan section gets the highest score at Level of Active frontage index.

- **Deep Observation**

Table 9 Average of demographic data in four sections of Imam Khomeini street during 6 working days (Saturday - Thursday)

Street name	Frequency of users	Sex ratio	Ratio of users in group to all users	Ratio of Elderly and children presence to all users
Abresan	158	1.37	0.55	0.08
Mansoor	48	4.24	0.44	0.10
Saat	126	4.23	0.40	0.08
Golestan	72	8.09	0.35	0.10

Table 10 Average of demographic data in four sections of Imam Khomeini street at the weekend (Friday)

Street name	Frequency of users	Sex ratio	Ratio of users in group to all users	Ratio of Elderly and children presence to all users
Abresan	59	2.01	0.69	0.10
Mansoor	19	2.33	0.67	0.11
Saat	25	3.44	0.60	0.09
Golestan	28	5.05	0.69	0.10

6.1.2. The second method: success evaluation based on questionnaire

In order to ensure the accuracy of place evaluating model results and to verify the hypothesis through questionnaire the success rate is evaluated according to the questionnaire data.

Table 11 Distribution of people according to the success of Imam Khomeini Street selected sections

Street name	Descriptions	Excellent	Good	Average	Fair	Not At All	Total
		5	**4**	**3**	**2**	**1**	
Abresan	**Frequency**	**10**	**25**	**35**	**7**	**0**	77
	Percentage	13	32.5	45.4	9.1	0	100
	Cumulative percentage	13	45.5	90.9	100	100	
	Mean			3.49			
Mansoor	**Frequency**	**3**	30	49	10	1	93
	Percentage	3.2	32.3	52.7	10.8	1.1	100
	Cumulative percentage	3.2	35.5	88.1	98.9	100	
	Mean			3.26			
Saat	**Frequency**	3	**24**	**46**	**9**	**2**	**84**
	Percentage	**3.6**	**28.6**	**54.8**	**10.7**	**2.4**	**100**
	Cumulative percentage	**3.6**	**32.2**	**86.9**	**97.6**	**100**	
	Mean			**3.2**			
Golestan	**Frequency**	2	**14**	**42**	**16**	**4**	**78**
	Percentage	**2.6**	**17.9**	**53.8**	**20.5**	**5.1**	**100**
	Cumulative percentage	**2.6**	**20.5**	**74.3**	**94.9**	**100**	
	Mean			**2.92**			
Imam khomeini	**Frequency**	19	93	172	42	7	332
	Percentage	5.4	28	51.8	12.7	2.1	100
	Cumulative percentage	5.4	33.4	85.2	97.9	100	
	Mean			3.22			

Similar to the results of the place evaluation model, the people's evaluation of Abresan street's success is more positive than other sections, while Golestan street has the worst score.

6.1.3. Third Method: Showing the Success in Each Street Section by Using the Point Density Model in ARCGIS

In order to spatially analyze the success level in Imam Khomeini Street of Tabriz, interpolation was used. The interpolation technique is a way of finding undefined point by using sampled points. In other words, this is the method for predicting the value of each pixel in raster layers. This is done by limited numbers of sample point. For interpolation, point layer was created and the value of each point was allocated according to the answer for each respondent (between 1 to 5). By using that layer and IDW (inverse distance weighted) method, raster layer of success was created. In IDW method it is assumed that sampled points are influenced by their location. In this method places of each respondent must be exactly determined on the map. After showing the success in raster layers each pixel shows success in every parts of street.

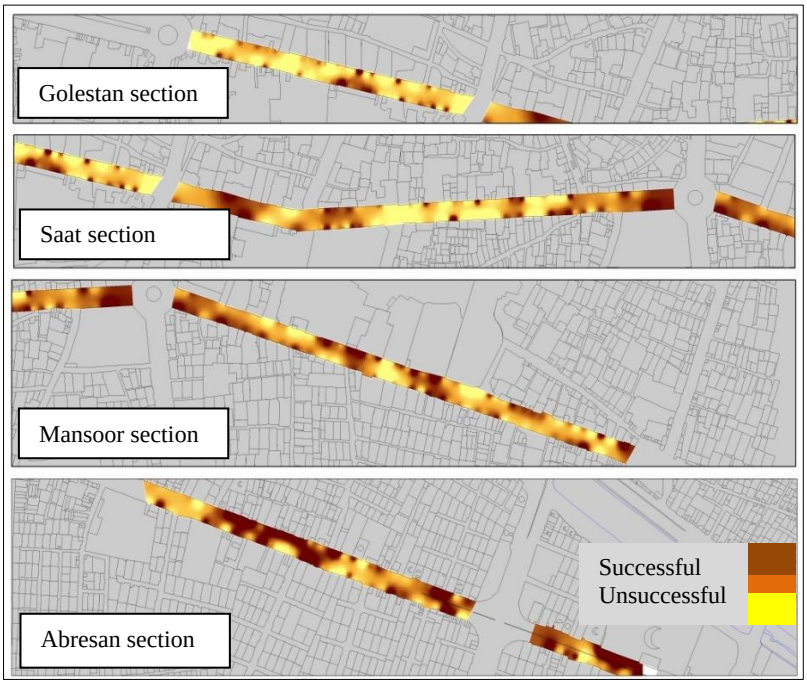

Fig. 2 Success level in four section of Imam Khomeini street (case study)

6.2. Second stage: explanation of the most important functional factors influencing the success of public space

For explanation of the most important factors influencing the success of public space, according to likert scale of data. Spearman correlation test run between proposed criteria and the success rate of selected sections at Imam Khomeini st by using 332 questionnaires. Results of all spearman tests used to evaluate the effectiveness of success factors were less than 0.05 and in most cases were less than 0.01. These numbers shows the correctness of tests have been used.

6.2.1. Results of correlation test in Imam Khomeini street

- First test

Running correlation test between (image & comfort, sociability, access & linkage, uses & activity) and success rate of Imam Khomeini street to prioritize the influencing factors.

Table 12 Prioritizing the dimensions influencing the success of Imam Khomeini street

Priority	Dimension	Correlation rate with success of space	Significant degree
1st	Image & comfort	0.83	0.000
2nd	Access & linkage	0.73	0.000
3rd	Uses & activity	0.67	0.000
4th	Sociability	0.65	0.000

According to table above the correlation test between space success dimensions and success rate has an acceptable significant degree (less than one percent error).

- Second test

Running correlation test between (comfort, activity, sociability, feeling of safety, enjoyment, symbolic access, visual access, physical access, psychological access, economic access) and success rate of Imam Khomeini Street to prioritize the influencing factors.

Table 13 Prioritizing the factors affecting the success of Imam Khomeini street

Priority	Factor	Correlation rate with success of space	Significant degree
1st	Comfort	0.72	0.000
2nd	Activity	0.67	0.000
3rd	Sociability	0.65	0.000
4th	Feeling of safety	0.61	0.000
5th	Enjoyment	0.56	0.000
6th	Symbolic access	0.5	0.000
7th	Visual access	0.48	0.000
8th	Physical access	0.47	0.000
9th	Psychological access	0.38	0.000
10th	Economic access	0.3	0.000

Table 14 Prioritizing the factors influencing the selected sections of Imam Khomeini street

Section name	Priority	Dimension	Correlation rate with success of space	Significant degree
Abresan	1st	Image & comfort	0.82	0.000
	2nd	Access & linkage	0.76	0.000
	3rd	Uses & activity	0.76	0.000
	4th	Sociability	0.71	0.000
Mansoor	1st	Image & comfort	0.84	0.000
	2nd	Uses & activity	0.69	0.000
	3rd	Sociability	0.69	0.000
	4th	Access & linkage	0.67	0.000
Saat	1st	Image & comfort	0.79	0.000
	2nd	Access & linkage	0.76	0.000
	3rd	Sociability	0.69	0.000
	4th	Uses & activity	0.58	0.000
Golestan	1st	Image & comfort	0.86	0.000
	2nd	Access & linkage	0.81	0.000
	3rd	Uses & activity	0.72	0.000
	4th	Sociability	0.58	0.000

6.2.2. Results of correlation test at four sections of Imam Khomeini street

In order to recognize the most important factors and to verify the hypothesis, the Spearman correlation test is used through SPSS software at four selected sections of Imam Khomeini st. The summary of these test results is mentioned in the following table.

According to table above the correlation test between space success dimensions and success rate of selected sections of imam Khomeini street has an acceptable significant degree (less than one percent error). According to the findings, comfort and image are the most effective factors for the success of these sections.

Table 15 Prioritizing the factors influencing the people's attendance at the public spaces

Section name	Priority	Factor	Correlation rate with success of space	Significant degree
Abresan	1st	Comfort	0.78	0.000
	2nd	Uses & activity	0.78	0.000
	3rd	Sociability	0.71	0.000
	4th	Enjoyment	0.56	0.000
	5th	Feeling of safety	0.55	0.000
	6th	Visual access	0.53	0.000
	7th	Physical access	0.51	0.000
	8th	Symbolic access	0.46	0.000
	9th	Psychological access	0.35	0.002
	10th	Economic access	0.26	0.024
Mansoor	1st	Uses & activity	0.69	0.000
	2nd	Sociability	0.69	0.000
	3rd	Comfort	0.66	0.000
	4th	Enjoyment	0.6	0.000
	5th	Feeling of safety	0.57	0.000
	6th	Symbolic access	0.55	0.000
	7th	Economic access	0.47	0.000
	8th	Physical access	0.41	0.000
	9th	Visual access	0.37	0.000
	10th	Psychological access	0.36	0.000
Saat	1st	Sociability	0.69	0.000
	2nd	Comfort	0.68	0.000
	3rd	Uses & activity	0.58	0.000
	4th	Feeling of safety	0.58	0.000
	5th	Enjoyment	0.58	0.000
	6th	Symbolic access	0.53	0.000
	7th	Physical access	0.5	0.000
	8th	Visual access	0.49	0.000
	9th	Psychological access	0.49	0.000
	10th	Economic access	0.25	0.02
Golestan	1st	Comfort	0.79	0.000
	2nd	Uses & activity	0.73	0.000
	3rd	Feeling of safety	0.61	0.000
	4th	Sociability	0.58	0.000
	5th	Visual access	0.58	0.000
	6th	Physical access	0.53	0.000
	7th	Symbolic access	0.53	0.000
	8th	Enjoyment	0.48	0.000
	9th	Psychological access	0.4	0.000
	10th	Economic access	0.33	0.000

According to table above the correlation test between space success dimension and success rate of selected sections of Imam Khomeini street has an acceptable significant degree (less than one percent error). According to the findings, comfort and activity are the most affective factors in the success of these sections.

In the questionnaire from 41 individuals and 20 focus groups, the position of activity, sociability, comfort & access dimensions are prioritized by asking the question: "you prefer a park or street if…". According to the results the people choose respectively comfort and image, uses and activity, access and linkage and sociability.

Table 16 Prioritizing the factors influencing the people attendance at public space

Priority	Dimensions	Factors	Score
1st	Comfort & image	It was beautiful	576
2nd	Uses & activity	It was memorable	514
3rd	Access & linkage	It was accessible	471
4th	Comfort & image	It was suitable for sitting or resting	460
5th	Sociability	It was suitable for talking and meeting friends	438
6th	Uses & activity	It has varied and interesting activities	434
7th	Access & linkage	It has suitable sidewalks	390
8th	Sociability	The other people have comfortable presence	287

7- Conclusion

In testing the hypothesis, in addition to verifying a significant relationship between the criteria and indices outlined in the model, the results show that comfort and image are the most important influencing parameters in the success of Imam Khomeini Street. Based on the theoretical framework, gender ratio, group presence, frequency of use of space, duration of staying in space were considered to be the most important indices of success in a public space. Therefore, in support of the findings of hypothesis test, comfort and image are the most determining factors in the successful function of a public space. Consequently, in order to increase the success level of a public space, first the comfort of space (feeling of safety, enjoyment and comfort) must be improved. In other words, if the comfort and image of space are promoted, the presence of women and people in the group will consequently be increased [9] and the increase in the attendance of women in space will result in the successful function of a public space. On the other hand, creating the suitable condition for outer activities and promoting the feeling of safety, enjoyment and comfort will result in further frequency of use of space and duration of stay in space, since they are the indicators of a successful public space.

Prioritization of influencing factors in the parameters of presence which was extracted from the analysis of 100 group and individual interviews could explain the causes of success for the Abresan section in relation to the other three sections. For the PPS institute, the underlying activity and usage were the main factors for a successful public space. However, the above study shows that the success of Abresan street is a result of spatial comfort, activity, access and sociability, which are in complete coordination with the result obtained from the prioritization of space for public attraction. Therefore, as Carmona indicates, one can conclude that the best solution for creating successful public spaces is understanding the mental and behavioral prioritization of people and coordinating the characteristics of the public space with the needs of the people. Successful public spaces must be able to attract whatever people desire around themselves, not whatever the designers and planners dictate.

In conclusion, in conformity with Stephan Carr's theory [14] the Abresan section is the most successful section because it provides comfort, passive and active interaction with space and caters for a variety of people's needs. In relation to comfort and image, according to the questionnaire obtained in Abresan, comfort, enjoyment and a feeling of safety had a considerable difference with other criteria of other sections. Moreover with respect to cleanness, orderliness and the provision of suitable sidewalks were in a better condition compared to the other sections studied. Broad pavements of Abresan, which were highlighted by 60% of the users, were indicated as the most important features of that section and had a direct relationship with the level of comfort in the space. Therefore, one can note that this is the most important factor of a successful public space with respect to comfort.

According to the proposed Place Evaluation Model, with respect to activities, the main difference between Abresan and the other sections, is the existence of coffee shops, café-nets and a diversity of spaces for amusement activities for all age and gender groups. The accessibility of meeting places, which are considered as one of the condition for a successful space by Montgomery [7] and third place according to Ray Oldenburg, is emphasized and verified in the research findings as one of the most important factors of a successful public space.

According to our analysis, one of the advantages of the Abresan section was its diversity of activities. By accomodating various commercial and service sectors such as clothes shops, mixed commercial passages, restaurants, educational complexes such Tabriz University, this section of Imam Khomeini Street has managed to attract a lot of people. In summary, it can be argued that there is direct and significant relation between comfort (image), sociability, access (linkage), uses (activity) and public space. Moreover, it was recognized that comfort and image are the most determining factors for the success of Imam Khomeini Street. Comfort and image, access and linkage, uses and activity, sociability, respectively are the most influencing dimensions for the success of this street and comfort, activity, sociability, feeling of safety,

enjoyment, symbolic access, visual access, physical access, psychological access, economic access are the most determining factors for the success of Imam Khomeini street. The success of this street can be explained by the harmony of street characteristics with users' need. Finally it can be concluded that Abresan, Mansoor, Saat and Golestan are respectively the most successful and unsuccessful sections of Imam Khomeini Street.

Note

1. Project for Public Space
2. $N = 3.84Pq\frac{3.84pq}{e^2}$

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