Analysis Of Physical Factors in The Reproduction of Urban Pedestrian Axes Based on Social Topography Concept (Case study: Farahzad-Imamzadeh Ainali-Zeinali axis in Tehran)

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ABSTRACT

The transition from a car-driven city to a human city based on a pedestrian lifestyle is one of the most important urban planning challenges today, especially in countries where their citizens tend to use cars due to cheaper fuel prices. Therefore, locating and feasibility study of creating pedestrian axes is one of the most important strategies and actions in modern urban planning. Since Tehran has heavy traffic and is one of the most polluted metropolises in the world, this issue becomes more important and necessary. This study aims to examine the arrangement of physical components of space in the reproduction of urban pedestrian axes based on social topography. This analysis was performed on the Farahzad to the Imamzadeh Ainali-Zeinali axis in Tehran. During this analysis, through a quantitative approach and based on deductive reasoning, the data was gathered using survey techniques and the correlation coefficient of the variables has been analyzed. In this respect, the cultural Farahzad to Imamzadeh Ainali-Zeinali axis as a field study platform was surveyed. The research area was examined based on the parameters of social topography: social and economic, accessibility and traffic and physical-spatial status. The statistical population in this research comprises 350 users and citizens of Tehran, which cross the Farahzad pedestrian axis to Imamzadeh Ainali-Zeinali in a day. A simple random method was employed to pick a sample from the studied population in this research. Utilizing the Cochran sampling formula, the sample size was 183, which grew to 200 for higher precision. Fifty-five variables of social topography development in space were identified and summed into nine factors based on internal correlations. That is, in this case, the promotion of social topography is chiefly the outcome of the performance of these determinants, justifying 90.23% of the social topography development in space. On this axis, the juxtaposition of facilities for entertainment, for religious activities and social presence, can play the most significant role in improving the quality of the environment for all residents.

Keywords: Human City, Pedestrian City, Physical Environment, Social Topography, Urban design.

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1. Introduction

A cultural approach based on social topography concept can aid people to recognize the advantages of a sustainable life. Design according to social topography in the area of architecture comes in three principles: adapting architecture to social structures, designing based on the demands of all parts of society, and human design. The latter is acquired from man and his lifestyle and is perceived as "social sustainability"[1]. The goal of sustainable architecture is the provision of solutions that present fitting living circumstances and the simultaneous coexistence of the three principles mentioned [2].

In contemporary communities, 70 to 90% of the lives of people are spent in architectural places. In this respect, architects, in line with other managers, have been seeking new resolutions to afford a pleasing life for humans [3]. Unmistakably, living, recreation, rest, and work happen in spaces created by architects. And since the advantages and drawbacks of a building directly impact the users, a dire task in this respect is the duty of architects [4].

From the past until now, routes have been the undeniable chief part of cities and are unquestionably part of the best public areas. Before the advent of cars, pedestrians were the principal operators of passages, and the routes were the heart of many social synergies [5]. The importance of the pedestrians is such that despite the dominance of automobiles in the urban transportation culture, pavements are the manifestation of urban life and a place for social activities and happenings of the citizens and urban life [6]. Therefore, their correct design and development lead to the enrichment of cultural and social life. Pedestrians or pavements are designed for walking to make residential areas pleasant and secure. With a review of the literature of elements and criteria, concepts, and records of the topic, this study aims to design a pedestrian-oriented approach to enhance the environmental quality of a cultural route from Farahzad to Imamzadeh Ainali-Zeinali.

Historical textures are the primary core of the formation of the cities and the civil and cultural origin of every city. The chief constituents of these historical textures are historical passages that enable access to residential areas and activity centers [7,8]. Previously, the cities had a high pedestrian-enabling capacity; Walking was considered the principal public transportation pattern within social centers due to their low cost or ease of access for every social class. The pavement issue started to fade away following the industrial revolution and the dominance of automobiles in cities [9].

The central issue in today's urban space is the prevalence of the car over the urban living space, and the car-centered view plans intercity transportations and designs the communication network of cities accordingly. The increasing enlargement of cities and the entry of cars into the field of human activity and the mechanization of urban life restricted streets and urban spaces in terms of walking [10]. Today, a sustainable and desirable city is nothing but a humane and pedestrian-oriented city.

But in new decades, this view has evolved and shifted to humanistic and empirical urban planning. This approach has resulted in the recognition of pedestrians and the planning and design of walker routes in the communication network of cities [11]. Pedestrian life in urban planning today is considered as a social approach to traffic management [12,13]. In this way, an attempt was made to reduce traffic difficulties in large cities, including many pollutions caused by car traffic [14].

Therefore, walking routes that are designed according to human movement, while preserving the texture and elements of its prominence as a set of cultural prominence, can provide the basis for more familiarity and interaction with space and urban axes and be a way for the flow of life inside the texture. Walking not only meets the relevant and contemporary needs of texture but also is considered a necessity to solve the problems of ancient and valuable axes in the heart of cities [15].

Communication networks and public spaces such as streets, alleys, squares, and essential urban spaces are the centers of activity and daily life of citizens. Consequently, their spatial recreation, design, and logical organization are critical aspects of humanistic urban planning. The historical textures of any city are considered valuable and historical core and valuable works, they form its identity, and they have high spatial, physical, and functional value. Thus, developing social sustainability with a pedestrian-oriented approach can establish a creative connection between the past, present, and future.

The actual characteristics of historical textures include their vulnerability to natural disasters, tissue and space wear, lack of proper access to public services, lack of public spaces and lack of desirable urban spaces, lack of efficiency and access, and so on. In general, these features impair the spatial qualities and introduce unstable quality

and uneven texture, unbalanced, disproportionate, and disproportionate. But since these textures have potential and actual properties and characteristics suitable for the civic activity and social and cultural interactions, it is possible to help preserve historical and cultural identities, historical continuity and add contemporary values, and promote environmental quality and social interactions, as well as the survival of the historical context, through appropriate recreation through pedestrianism. Due to the social and cultural values as well as the lasting and embedded values of Iranian architecture, undoubtedly, the reasonable and worthy promotion of the mentioned historical passage by prioritizing the walking on the axis and improving the qualities of pedestrians from a socio-spatial perspective can improve the quality of this axis and living and functional conditions, and recreate and revive a space to create desirable social interactions between humans and society with the urban space.

Therefore, this study seeks to answer these questions: which components can explain the concept of social topography? What are the special features of Farahzad Cultural axis? What is the relationship between independent and dependent variables in order to create pedestrian life in the study area? The main purpose of this study is to identify the environmental and physical factors in the study area, their degree of convergence to achieve public urban space based on the concept of social topography and social justice.

2. Research background and theoretical basics

Walkability was vital in pre-industrial cities. In these cities, residents traveled to work and trade, either on foot or using slow-moving carts and wagons. This made the texture well-grained and the housing density relatively high. Also, all places had to be joined by a connected pedestrian network. The concept of pedestrian streets in their current form first emerged in European cities. From the middle decades of the twentieth century onwards, this idea was designed and implemented in European cities to preserve the historical boundaries of cities from cars and for preserving ancient textures and reviving the social centers. The idea of turning urban routes into pedestrian streets in the historic and central areas of European cities was first implemented in a limited and local experience on one of the shopping streets in the center of the German city of Seine. Notice to this became more apparent after World War II and when it was the time to rebuild European cities. The success of the project mentioned in the Seine led to extensive measures in many European cities in the following decades. So much so that until the 1980s, cars were banned in most central and historic parts of major European cities. Five hundred cities in Germany and more than one hundred cities in France were intervened for this purpose [16].

The first effort to distinguish non-pedestrians from pedestrians worldwide was made in 1858 by the American city planner and architect Frederick Love Olmsted. He suggested the presence in the pristine nature and viewing the natural landscapes to reduce the psychological pressures of the daily life of the citizens. In designing New York Central Park, Olmsted built a stone bridge over the road for pedestrians. In this project, he designed independent routes for fast and slow pedestrians and non-pedestrians, and by integrating the park in New York, he left the pristine features and natural order of the park to maintain its distinction with the city. In the United States, after the Second World War, these types of pedestrian streets formed under the name of Mall, which were mostly in line with commercial purposes in the city center, and at the same time, their purpose was to create positive environments for shopping and walking in cities. In this respect, the idea of allocating pedestrian-specific areas in European and American countries has been employed many times, and hundreds of successful projects in this field can be named. The following includes a brief overview of some of these designs. In the stated examples, an attempt is made to point out the different dimensions and results that the application of this idea may include. The Munich Pedestrian Network physically and symbolically connects the medieval heart of the city to other areas. The first sidewalk in Munich was built between the two main medieval gates of the city: Karlster on the west front and Rathaus on the east front. The entire city pedestrian system includes this backbone that links the two gates, along with a set of smaller tributaries that connect to side streets. There are some plazas within the boundaries of this pedestrian area. The city has benefited greatly from its pedestrian stretch. Its old core has not only become an urban monument but also includes most of the hotels, restaurants, and cafes. Along with these attractions, this pedestrian zone has rendered a stable and diverse day life and nightlife for the street [17,18].

In mid-August 1973, the German Chamber of Commerce and Industry announced the findings of its study on walking at a congress. According

to this statement, in 1974, 208 urban districts and neighborhoods in Germany had their pavements [19, 20].

When the main street in Copenhagen became a pedestrian street in 1962 as the first such project in Scandinavia, many analysts predicted that the street would be emptied since the urban activity was not part of the Northern European tradition. Now, the main sidewalk and several sidewalks later added to the system are filled with people walking, sitting, playing music, painting, and talking to each other [21].

Seyyed Mohsen Habibi in his work entitled "Tourism Walkway" considers it as a "bilateral and perhaps a multilateral step to revive the old urban textures" [13]. Seyyed Mohammad Mehdi Moeini in a study entitled "Increasing Walkability, a step towards Recalling the past Walkability of cities" considers it the main model of moving people inside social centers due to its low cost or easy access for all sections of society, which have been forgotten today following the industrial revolution and the domination of cars in Cities [9].

Behnaz Aminzadeh and Faramarz Daeinejad in a work named "Environmental Considerations in the Design and Improvement of Urban Streets" reported the increasing decline of the environmental quality of Iran's major cities due to lack of attention of employers, designers, and planners to the current deterioration of environmental conditions, lack of a comprehensive environmental program and policy, and lack of clear concepts and principles of sustainability solutions. Therefore, they emphasize environmental considerations to achieve "sustainability" and "vitality and urban life" by providing principles in the design of urban streets. These principles are based on three axes: regulating the environment in an ecological framework, paying attention to energy-related constraints, and rehabilitating recycling rather than widening and constructing roads. Their points to implement the above principles include an emphasis on creating diversity and balance in street design, strengthening non-motorized traffic (pedestrian, bicycle), and repairing existing streets [22].

Numerous studies have been conducted on this basis in recent years with the aim of creating pedestrian life in Iranian cities [23, 24, 25, 26, and 27]. In these studies, feasibility study, selection of appropriate route and management of existing land uses have been the main objectives. In practice, in some cities such as Hamedan, Tabriz and Shiraz, some riding streets became pedestrian crossings, mainly due to excessive riding traffic on streets that could not be widened due to their location in the historical context.

In parallel with the development of urban pedestrian life, both in theory and practical experiences, the concept of social topography has been raised in the discipline of sociology more than before and found its way into sociological studies related to urban planning and living spaces [28, 29]. Some of these studies have also addressed the role of social injustice in the incidence of crime in cities [30].

Summarizing the views of thinkers in this part, it should be emphasized that sustainable urban life in the 21st century will not be possible except through ecological urban planning and urban design based on ecological considerations to reducing energy consumption and fossil fuels. To this end, according to previous studies, environmental qualities resulting from physical capacities, diverse and responsive spatial planning, pedestrian axes with cultural, social and entertainment attractions that can additionally include daily and ordinary activities, can provide a basis for realize life on foot.

The key subject of this article is the study of the arrangement of physical elements of space in the reproduction of urban pedestrian axes based on the idea of social topography with the focus on the concept of social justice and attention to pluralism. In this regard, rules have been sought to improve the environmental quality of urban streets with the approach of social sustainability in the cultural passage from Farahzad to Emamzadeh Ainali - Zeinali to improve its spatial-functional quality to be able to preserve this valuable work by recreating this historical route by promoting walkability by infusing contemporary values in it and to continue the historical and cultural identity of this cultural-historical core of Tehran as an all-encompassing area. The identified factors to achieve this goal are shown in Figure 1.
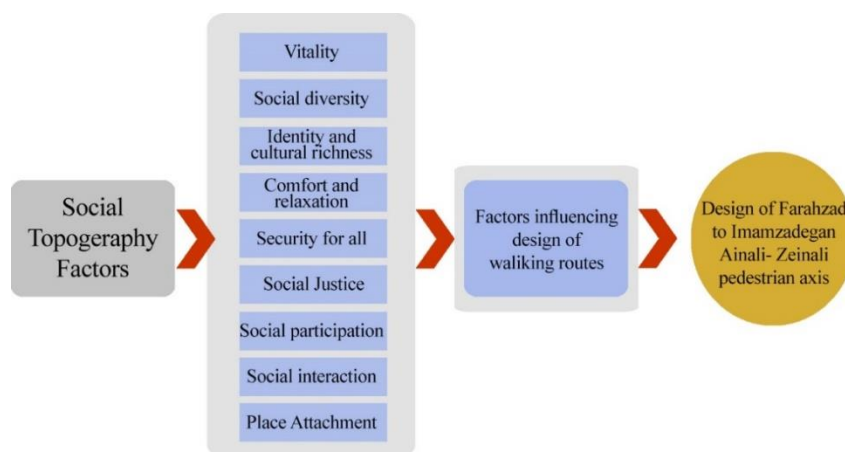
Fig 1. Social topography factors which are analyzed in this area (source: authors)

3. Research Methodology

The philosophical basis of research in this study is interpretivism and the logic of reasoning is moving from theory to sample study. Hence, the logic of reasoning is deductive. The research method is quantitative and the research strategy is survey. Since field data is gathering over a period of specific time, and also observes a specific point in time, the study is cross-sectional. Field data were collected through the distribution of a questionnaire and examined through factor analysis. Therefore, both documentary and field methodologies have been used. In the first technique, the theoretical arguments and thematic literature of the research in this area have been studied, and, in the meantime, the principles, grounds, and procedures related to the planning and organization of pedestrian axes in urban centers have been presented. In the following step, the available data and information concerning recognizing the study domain from the comprehensive plan reports and investigations of the historical-cultural area of Imamzadeh Ainali-Zeinali have been used.

In the second technique, to complete the information, the data has been collected using survey methods. In this respect, the Farahzad to Imamzadeh Ainali-Zeinali cultural axis was surveyed as a platform for field studies. Lastly, the study domain was extracted based on the analysis of social topography parameters - social and economic status, access and traffic status, and physical-spatial status - and results were obtained. In the procedure of this project, different cognitive tools were employed, including library studies, observation, interviews, and distribution of questionnaires, as well as referring to online scientific references. SPSS was also used to analyze the data.

The statistical population in this research consists of all users and citizens of Tehran linked with the pedestrian axis of Farahzad - Imamzadeh Ainali and Zeinali. Since the validity of the results of a study relies on the accuracy of its sampling and is measured with it, in this research, a simple random method was used to pick a sample from the study population since the statistical population is not entirely homogeneous. Accordingly, using the Cochran sampling formula, the sample size from about 350 people crossing this area, was 183, which grew to 200 for higher precision. Research diagram is shown in figure 2.

3.1. Social Topography Questionnaire

The questionnaire to evaluate social topography in the neighborhood and the cultural axis was split into two sections. The first part addresses independent variables such as dynamism and vitality, comfort and tranquility, social justice, cultural identity and richness, social security, diversity, social attachment to the place, and social participation. The intention is to examine the effect of these variables on the state of social topography in space. The second section addresses the dependent variable of social topography. The evaluation of these variables was done using a five-point Likert scale (1- very low, 2- low 3- somewhat, 4- high, and 5- very high). Cronbach's alpha was used to assess the reliability of the questionnaire. The value of alpha obtained is 0.86, and for the studied variables is as follows, showing the high reliability of the research tool.
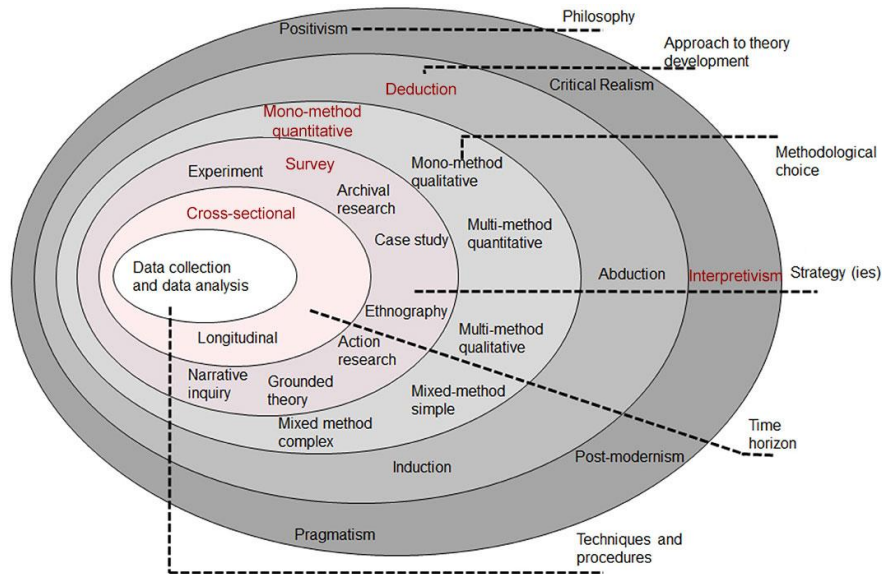
Fig 2. Research onion diagram (source: authors)

Table 1. Validity of the research tool, the questionnaire (source: authors)

Cronbachs' Alpha	N OF Items
0.86	55

According to the table below, Cronbach's alpha coefficient for all questionnaire questions is 0.86. And this coefficient for the variables of vitality, social diversity, cultural identity and richness, comfort and tranquility, security, social justice, social participation, social interaction, spatial affiliation, is respectively 0.71, 0.69, 0.73, 0.84, 0.79, 0.91, 0.81, 0.76 is 0.72.

Table 2. Reliability of research tools by variables (source: authors)

Reliability tables of the questionnaire		
Criteria	**Number of elements (questions)**	**Cronbach's alpha**
The whole questionnaire	55	0.86
Vitality	7	0.71
Social diversity	6	0.69
Identity and cultural richness	6	0.73
Comfort and relaxation	6	0.84
Security	6	0.79
social justice	6	0.91
social participation	6	0.81
Social interaction	6	0.76
Spatial attachment	6	0.72

4. Case study: Farahzad river valley

The study area of Farahzad Valley, which is shown in Figure 2, is 64 hectares located in the north of Tehran between the 2nd and 5th districts of Tehran Municipality. The study area starts at an altitude of 1800 meters at the north and ends at the Yadegar-e-Imam Highway at the south. Punak region has been the site of large and old gardens in the north of Tehran, but a small number of them have survived. . This traditional structure, in fact, is the main difference between the Imamzadeh Ainali and Zeinali areas with other parts of this neighborhood as well as Tehran. The need to preserve this texture in this study as one of the main adsorbents in the range in order to comply with the surrounding set and also strengthen the traditional texture is quite noticeable.
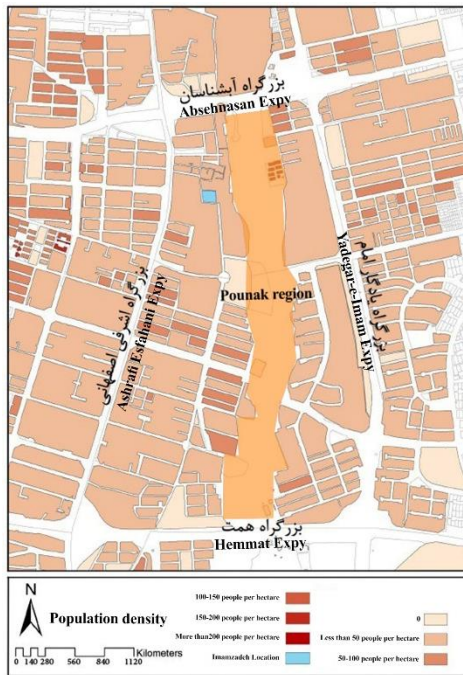
Fig 3. Population density in the studied area

Fig 4. Important capacities and buildings in the area

5. Discussion and finding of results

This segment examines the status of data and analyzes those using statistical tests. The research hypothesis is there is convergence among the 55 items in the questionnaire, and they can be reduced and aggregated into 9 more general factors, which are the same factors presented in Figure 1. These factors can constitute the basis for intervention policy in the area under study. First, using descriptive statistics, the demographic characteristics of the study population were studied. Next, the study hypotheses were examined using statistical inference tests.

Descriptive findings show that regarding the frequency distribution of gender variables, 51.8%

of respondents are male, and 48.2% are female. Additionally, 5.9% are high school graduates, 21.2% have a diploma, 22.4% have an associate degree, 38.8% have a bachelor's degree, and 11.8% have a master's or higher degree. For the job variable, 49.4% are unemployed, 22.4% are self-employed, and 28.2% are government employees.

The table 3 shows the central criteria and dispersion of the age variable, which include mean, standard deviation, variance, maximum and minimum. According to the table below, the mean and standard deviation are 32.93 and 8.928, respectively.

Table 3. Central criteria and dispersion of variable of the age

Variable	Age
Number	85
Average	23.93
Standard deviation	8.928
Variance	79.709
Maximum	18
AMinimum	55

Based on the result of the KMO test with an output of 0.847, the data used can be summarized in several basic factors. Also, the numerical value of the Bartlett test (777.607), which is significant at the error level of less than 0.01, shows that

there is a high correlation between items within each factor, and no correlation is observed between items of one factor and items of another factor.

Table 4. The results of the KMO and Bartlett tests

KMO	0.847
Bartlett	777.607
Degree of freedom	28
Significance level	0.000

The table below shows the contribution of each factor in explaining the total variance of all variables. In this table, Eigenvalues, percentage of variance (diffraction), and percentage of cumulative variance explained from the data set by each factor are given.

Table 5. Total sum of justified variances

Variable	Eigenvalues			The sum of the squares of the extracted factor loads		
	Total	Variance %	cumulative variance %	Total	Variance %	cumulative variance %
1	18.698	33.997	33.997	7.615	13.846	13.846
2	4.270	3.763	41.760	5.578	10.142	23.988
3	3.738	6.796	48.556	4.374	7.952	13.940
4	3.156	5.737	54.294	3.569	6.455	13.428
5	2.752	5.003	59.297	3.185	5.790	44.219
6	2.488	4.524	63.820	3.110	5.655	49.874
7	2.236	4.065	64.886	3.078	5.597	55.471
8	1.787	3.250	71.135	2.881	5.239	60.710
9	1.480	2.690	73.826	2.739	4.979	65.689

The Figure 4, known as the scree plot diagram, shows the number of selected factors. Using this chart, the number of factors can be determined. As shown in the diagram, the five factors have Eigenvalues higher than 1. That is, a total of 55 variables can be reduced to 9 factors.
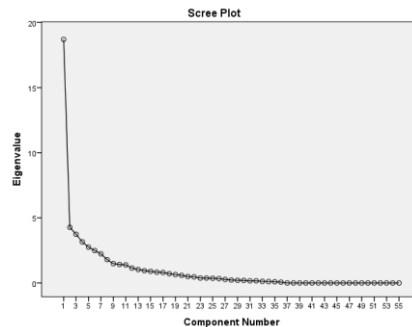

Fig 5. Scree plot diagram of the factors

According to the analysis and the values of the factor loads of each variable, the components of social topography are effective in designing the cultural complex and the pedestrian axis of Farahzad-Imamzadeh Ainali-Zeinali. A multiple regression model and the Inter method have been used to predict changes in the dependent variable of social topography based on 9 independent variables.

Table 6. Regression model of predictor (independent variables)

Regression model	Input predictor variables	Excluded variables	Method
Inter	0	Vitality Social diversity of identity And cultural richness Comfort and relaxation Security social justice social participation Social interaction Spatial attachment	1

This table gives the model summary. The value of correlation between variables is 0.933, which shows a moderate to low correlation between the set of predictor variables and the research criterion (social topography). But the value of the adjusted determination coefficient (0.935) shows that 93.7% of the total changes in social topography among the study population depend on the predictor variables in the equation. That is, the set of predictor variables predicts 93.7% of the variance of the social topography variable.

Table 7. Correlation of the variables

model	Correlation	determination coefficient	adjusted determination coefficient	Standard error
1	0.933	0.937	0.935	2.04353

According to the table above which gives the findings of the analysis of variance, the value obtained (760F / 808) at the error level less than 0.05 confirms that the predictor variables have high explanatory power and can explain the change amount and variance of the criterion variable. That is, the regression model is fit and can predict changes in criterion variables based on predictor variables.

Table 8. Variance analysis

Regression model	Sum of squares	Degree of freedom	Mean of squares	F	Significance level
regression	23641.672	7	3377.382	808.760	0.000
Regression residues	321.552	77	7.176		
Total	23963.224	84			

Based on the standardized impact factor, the model and the impact of the variables are interpreted. Because this coefficient represents the standardized regression coefficient of each of the predictor variables on the dependent variable. In this way, the relative share of each predictor variable in the model is determined. In the table below, considering that the error level of all independent variables studied is less than 0.5, their effect on the amount of social topography is significant. The variables of vitality, comfort, and relaxation with beta coefficients of 0.348 and 0.258, respectively, have the highest effect on the social topography variable.

Table 9. Results regarding the effect of predictor variables on the criterion of social sustainability

Model	Non-standardized regression coefficient		Standardized regression coefficient	t	Significance level
	β	Standard error	β		
Vitality	1.217	0.148	0.348	8.243	0.000
Social diversity	1.035	0.201	0.119	5.152	0.000
Cultural identity and richness	1.079	0.207	0.150	5.205	0.000
Comfort and relaxation	0.732	0.140	0.025	5.231	0.000
Security	1.667	0.156	0.225	10.658	0.000
social justice	1.010	0.141	0.76	7.174	0.000
social participation	1.295	0.145	0.205	8.929	0.000
Social interaction	1.025	0.201	0.127	6.152	0.000
Spatial attachment	1.069	0.207	0.140	7.205	0.000

6. Conclusion

In most previous researches on the creation of pedestrian axes, the main problem is the management of land uses and the creation of favorable conditions in this regard. The challenge of relocating functions which have been in those places for several years and have their own customers is one of the most significant obstacles

to realizing pedestrian life. On the other hand, those functions that most of their customers come to them by their cars, resist against the plans of converting the car axles to pedestrian axes. Therefore, most studies are focused on minimizing the damage caused by the creation of a pedestrian axis. But in this study, basically the issue of land uses is not a challenge to the goals, because the studied area is urban green space that has the capacity to become an urban pedestrian axis. Potentials such as urban park, green space and the existence of Imam Zadegan tomb, has created a situation that can create favorable conditions for presence in the urban space. Therefore, the distinguishing feature of this investigation from many previous studies is the specific characteristics of the studied area. The concept of social topography is the mainstay of the present study. A concept that refers to the acceptance of diversity and pluralism in the community and the non-leveling of different strata. A notion that respects the differences in the people of the society and tries to promote and deepen the presence of all the individuals in the society and the use of the space based on justice. In this research, an attempt was made to extract physical and environmental factors based on this idea.

The impact of the social topography approach in designing the Farahzad to Ainali-Zeinali Imamzadeh cultural complex and pedestrian axis using factor analysis with principal components technique and varimax rotation proved that 55 variables of social topography promotion in space can be summarized in 9 factors according to their internal correlation. In other words, the development of social topography is chiefly the outcome of the performance of these 9 factors. The sum of these 9 factors justifies 90.23% of the promotion of social topography in space. These factors are reviewed below.

1. Dynamics and vitality: The factor loads of the variables show that variables of complex spaces, interior design, attention to the variety of materials used, details of human behavior, attention to green spaces, design of collective spaces for sitting and interacting with others, the presence of trees, and water and vegetation, and legibility of spaces are influential factors in users' assessment of dynamism and vitality in space and show the most weight in the first factor (dynamism and vitality).

2. Comfort and relaxation: The second-factor loads are a combination of paying attention to the needs of special people (elderly, disabled, and children), paying attention to leisure and recreational activities, proper design of access paths in the yard and inside the building, paying attention to designing open spaces and creating a sense of comfort with furniture and vegetation. Satisfaction with integrated services can enhance comfort and tranquility in the space and ultimately improve the social topography of the space, which are representatives of this factor.

3. Social justice: Holding conferences and ceremonies at the national and regional level, participating in local and indigenous concerts, allocating more welfare and social facilities, paying attention to the cultural center, which is effective in increasing social justice in the city and cultural complex have the largest share on this factor.

4. Cultural identity and richness: Diverse green space, stylish architecture, and high security in creating identity, giving identity to each section of the cultural complex by giving different names such as conference halls, concerts, etc. are some of the components of this identity factor. Also, the fact that each building, while having integrity, is different from each other, plays an important role in forming the identity and legibility of the site.

5. Social Security: This factor has been mentioned by users in the form of security and guard at the entrance of the compound and proper control of entry and exit, proper lighting at night, adequate monitoring of the compound and units, and the presence of CCTV cameras in all parts of the compound.

6. Social diversity: The factor weights of the variables show that variables of attention to children's play spaces in cultural complexes and the possibility of the presence of different social groups in different age groups in the space, attention to social homogeneity and social cohesion (management and social aspect of religious places in Tehran) have the largest share on the satisfaction factor.

7. Social attachment to the place: About this factor, visual calmness, legibility and clarity of compatibility with cultural-religious characteristics, use of visual works of art in public spaces and galleries, variety and possibility of personalization in the skin of the building, variety of activities, use of memorable elements and features in space, design of memorable collective spaces, and encouraging people to be present in the space have the largest share on this factor.

8. Social participation: Regarding this factor, variables such as participation in conferences, especially local conferences and local music, etc., holding public celebrations in cultural spaces, creating leisure spaces such as cinemas and places

for young people, and the existence of coffee shops and restaurants have the largest share.

9. Social interactions: About this social factor, variables such as creating suitable spaces for attending and meeting friends and acquaintances in the complex, the existence of an open amphitheater for street theaters, the existence of side spaces such as commercial areas, and spaces for eating out (including restaurants) have the largest share.

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