

Investigating the Constituent Elements of Physical Identity Based on the Citizens' Cognitive Maps; Case Study: Davachi Neighborhood of Tabriz*

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Received 14 March 2019;

Revised 08 June 2019;

Accepted 01 July 2019;

Available Online 20 March 2021

ABSTRACT

Iranian cities enjoyed a particular identity and character in the past while currently, the collapse of the identity, especially in the old centers and historical contexts of the cities, is one of the main concerns of the design. Due to the formation of mental images and clear and accurate cognitive maps of the environment throughout history, it is considered a tool to achieve internal representation of the environment. The current study was conducted to deduce the perceptual similarities and their effect on the physical identity of the neighborhood to the adaptation of the physical identity of four districts of the Davachi Neighborhood to the citizens' cognitive maps. The current study was analytical-descriptive research. The information collection methods were library and field research, the questionnaire, and the cognitive mapping technique. To analyze the data, the statistical-analytical methods, such as Analytic Hierarchy Process (AHP) and overlapping cognitive maps to deduce the findings. The research findings indicated the effect of the cognitive map elements in shaping the physical identity of the neighborhood. The received score of the elements of the cognitive maps in the formation of the mental images in Davachi 3, Davachi 1, Davachi 4, and Davachi 2 districts, respectively, were consistent with the urban experts' scoring to the components of the physical identity in four districts of the neighborhood. Studying the cognitive maps in the formation of the neighborhood is an introduction for the managers, urban planners, decision-makers, and whoever plays a role in the construction of the city to build a city whose identity features are desirable and responsive.

Keywords: Physical Identity, Cognitive Maps, Mental Image, Urban Space, Davachi Neighborhood.

* This paper is derived from the third author's master thesis of the architecture entitled "Analyzing the aspects of the sense of belonging in the historical neighborhoods based on the mental images", which was conducted under the supervisions of the first and second authors in the Faculty of Architecture and Urbanism, Tabriz Islamic Art University, in 2017.

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1. INTRODUCTION

When talking about the identity of a city, some features are manifested in our intellectual thought and mental image, representing our favorite city (Hull, Brace, & Gabriela, 1994, p. 110). The identity of a phenomenon is not abstract and separate from other issues related to that phenomenon. Also, the identity of a neighborhood is related to and inseparable from many issues, including neighborhood residents, beliefs, lifestyle, ideals, culture, worldview, etc. An urban neighborhood, which is an independent physical system in the form of the Iranian city, was able to play a significant and stronger role in the solidarity of the Iranian city than urban identity over time and during the process of its formation with the spatial identity (Bagheri, 2009, p. 157).

Identity in the historical cities is more related to their physical identity. Physical identity means the features and characteristics that distinguish the body of the city from others and manifest its similarity with its own. These features must be in a way that the body of the city is evolving and transforming while maintaining temporal continuity and result in the emergence of a whole (Mirmoghtadayi, 2004). When the human tries to perceive the urban space, he/she interacts with it and finds its way in it. That said, his/her mind attempts to keep a clear, coherent, and cohesive image of the space to use these images in the later encounter with the environment. These mental capabilities lead to the formation of the cognitive map. The person's cognitive map of the space is influenced by the aspects of the spatial body, aesthetics and geometric features, and spatial functions. They also can be influential in the formation of the mental image of the city in the citizens' minds. Given the time and history, the shape and change of the structure of the cities, deterioration of the historical monuments and old centers of the cities, development of the new constructions in the old centers and historical textures disregarding their identity and context, and on the other hand, the lack of proper facilities and alike factors have caused lots of damages to the latent values in the cities and urbanism patterns.

Given that the Davachi Historical Neighborhood of Tabriz has been studied in the current research, recognizing and understanding the structure of the neighborhood and efforts were conducted to preserve, regenerate, and develop for the continuity of its past values. Recognizing the physical identity of the neighborhood and its relationship with the cognitive maps and their influential components in the form of the neighborhood are the introduction for the managers, urban planners, decision-makers, and whoever plays a role in the construction of the neighborhood to build a neighborhood that its identity features are desirable

and responsive. The current research aims to study the elements of the cognitive maps regarding the physical identity of the neighborhood. To investigate the relationship between the cognitive maps and the features of the physical identity of the neighborhood, the current study attempts to answer the following question: What is the difference in the results of the study of physical identity based on cognitive maps in the four districts of Davachi neighborhood? Is there a significant relationship between the physical identity of the neighborhood and the residents' cognitive maps in the four districts of the neighborhood?

2. THEORETICAL FOUNDATIONS

To identify the physical identity of the neighborhood and its relationship with cognitive maps, first, each of the issues raised by different thinkers was studied. Then, the effective components were analyzed.

2.1. Physical Identity

Identity is a phenomenon formed in the historical context of a society. Identity represents the features of a person of phenomenon (Bemanian, Pourjafar, Ahmadi, & Sadegi, 2010, p. 40) and is a result of the mental feelings caused by its presence and broad social relations that requires a place to be formed (Pourjafar & Sadar Hashemi, 2011, p. 12). It leads to create similarity in a person, people, or nation, and in contrast, differentiates between people and groups (Akbar, 2008, p. 220). The sense of identity is internalized in the person over time. It directs the person's behavior, and eventually, unites the society. The created behavioral unity in the society seeks a physique to meet the behavioral and mental needs of a person and society. Each physique enjoys physical order, visual order, physical comfort, and balance (Movahed, Shamami, & Zanganeh, 2012). Hence, physical identity means features and characteristics that differentiate the body of the city from others, and manifest its similarity with the related one. These features must be in a way that the body of the city is evolving and transforming while maintaining the temporal continuity, and eventually, leads to the formation of a whole. Physical identity is conceptually synonymous with the terms "personality" and "sense of place." (Mirmoghtadayi, 2004, p. 29).

However, in a definition of spatial identity, Lewitka considered it a part of the personal identity that interacted with the physical environment (Lewitka, 2008, p. 211). Proshanski stated: "Spatial identity was a part of the substructure of the personal identity of the human and a result of his public recognitions about the physical world where he lived (Proshansky, 1976, p. 147). Given the conducted studies, definitions of the physical identity by other scholars were presented in Table 1.

Table 1. Scholars Definitions Regarding the Physical Identity

Theorist	Definitions of the (Physical) Identity	Reference
Lynch	The extent to which a person can identify a place as a place distinct from other places, in such a way that it has a unique personality.	(Lynch, 1960)
Proshansky	Spatial identity is a substructure of the personal identity of the human and a result of his public recognitions about the physical world where he lives.	(Proshansky, 1976)
Cullen	It is the consideration of the individual characteristics of each environment and avoidance of the uniformity in the urban environments through manifesting the particular characteristics of each environment.	(Cullen, 1998)
Karl Kropf	Morphology is a factor to identify a city from another, and this factor shows the character and identity of a city.	(Nouri, 2006)
Lawrsen	The city is formed by differences rather than phenomena. Material differences provide us with the required directions to know where to go and how to move. Indeed, it can be said that spatial variety implies semantic variety.	(Moallemi, 2007)
Ralf	Identity is the interactive relationship between “the physical and external composition of the symbols”, “visible functions and activities”, and the concept of the symbols in the environment.	(Bazrgar, 2017)
Alexander	Every space is formed by the constant repetition of a particular pattern of events that occur in that place. The identity of each city or building is more influenced by the event in which it takes place.	(Alexander, 2002)
Lalli	Physical identity has a positive effect on the citizens' ability and confidence and differentiates the citizens of a city from non-citizens.	(Lalli, 1988)

2.2. Components of the Physical Identity

Every space and place is a source of identity and physical identity of the groups located wherein (Rabbani, 2002, p. 37). As a set of a combination of the social and natural factors and the known environments by the human, where the residents have been concentrated, a city also has a particular identity (Shieh, 2006, p. 4). It is an identity that distinguishes the city from other

cities and gives meaning to its residents. This particular character and identity are described and defined by various components. These components form the natural structure of the city based on the difference in shape, content, and function. They are different in various cities (Varesi, Bafandeh, & Mohammadzadeh, 2010, p. 23). Components of the physical identity stated by the experts have been presented in Table 2.

Table 2. Stated Components of the Physical Identity

Experts	Paper and Book	Stated Components of (Physical) Identity
(Mirmoghtadayi, 2004)	Recognition and evaluation criteria of the physical identity of the cities	Its Distinction From the other and its Similarity with the Self, Maintaining Continuity while Evolving, Maintaining Unity in the Plurality
(Varesi et al., 2010)	Investigation and analysis of the components of the urban identity and its relation to the citizens' sense of belonging of the new cities	Different Shape, Content, and Function
(Nasr, 2016)	Role of “urban landmarks” in analyzing the components of “identity” and “culture” in the image of the Iranian city	Natural Components, Artificial Components, Human Components
(Bazrgar, 2017)	Investigating the role of the urban elements in improving the physical identity, case study: Shiraz City	Historical Value, Vernacular (Contextualism), being Distinctive, Welcoming, Design, Form and Architecture, Spatial Enclosure, Façade
(Hosseinizadeh et al., 2014)	Explaining the role of Jame Mosque of Yazd in creating the sense of place and identity in the physical space of the city	Difference/ Similarity, Proximity, Maintaining Unity in Plurality and Continuity While Evolving
(Habib et al., 2008)	A Following Questionnaire In Discourse of Physical Aspect Of City and Identity	Existing Distinction with Context, Similarity, Proximity, Inclusion
(Rahmani et al., 2016)	Analysis and Investigation of the Indicators affecting the identity of the neighborhood (case study: Mesgarha Neighborhood in Zanjan City)	City Formation, Physical Structure and Features of the City, Ancient and Old Places, Accessibility Features, Functional Characteristics of the Constituent Elements and Components of the Physical Texture of the City, Architectural and Building Representation of the City, Movement Features of the City.

Experts	Paper and Book	Stated Components of (Physical) Identity
(Alireza Noghel et al., 2009)	Investigation and evaluation of the indices affecting the urban identity (Jolfa Neighborhood in Isfahan)	Legibility, Skyline and Wall, Mixed Land Use, Sign Elements
(Behzadfar, 2007)	The identity of the city (A look at the identity of Tehran) (Constituent components of the identity of the city: physical or objective and mental or psychological aspects)	Human, Artificial, and Natural Components of the Environment

2.3. Mental Images

The mental images in the observer's mind are the result of the interaction between the environment and the observer. The cognitive process and perception of the place are possible by the association of the initial mental images, memories, and personal experiences. The cognitive map includes the process of obtaining information, coding, recording, remembering, and decoding regarding the relative situation and physical state, which is formed by various factors. In other words, the people's mentality regarding the places is shaped based on their mental image. The mental image includes the details of the place and their processed features that a part of this mental image is the cognitive map (Pakzad & Bozorg, 2014, p. 2).

2.4. Cognitive Maps

Tolman developed the cognitive for the first time in 1948 during the studies on the behavior of the mice. He

called this capability a mental model (Tolman, 1948). In simpler terms, these maps are the tools to organize and save spatial information, leading to increasing the mental capacity and improving the learning and recalling the information (Pourjafar, & Sadat Hashemi Demnah, 2011). According to Mondschein, the elements of the cognitive map are as follows: points, lines, and districts. Investigating these elements in other theories, such as Lynch's mental image (path, landmark, edge, node, and neighborhood), Norberg-Schulz's perspective (place, path, territory), and Stea' perspective (points, territories, paths, obstacles) shows that the stated factors are the different definitions of the three main elements of the cognitive map (Pakzad & Bozorg, 2014). The visual principles of Gestalt also introduce the path and edge as the elements of continuity. These elements are the constituent factors of the legibility in the environment (Eraydin, 2007, p. 59). Table 3 shows the elements of the cognitive map.

Table 3. Elements of the Cognitive Map

Thinkers	Elements of the Cognitive Map
Lynch	Path, Edge, Node, Landmark, and District
Norberg-Schulz	Path, Place, and Territory
Downs-Stea	Path, Boundary, Node, and Obstacle
Gestalt Theory	Continuity Components, Dissimilar Components, Good Form, Proximity, and Similarity

Many studies have been conducted to understand the mechanism of our perception of the environment and the way of remembering its content. Mapping a cognitive map is the key method to achieve this purpose. That is, emerging the mental image of the environment that people form and use as their behavioral pattern in the city (Madanipour, 2000, p. 98). Another function of the cognitive maps is the inducement and clarification of the environmental meanings as people create meaning and feel the urban phenomena in the city by drawing distinctive lines between various sensory works. A city is a complicated area of perceptions and memory. However, the meaning of the urban space is not limited to personal and cultural memory. Savage and Henry (1996) introduced the path and node as the legibility factors of the urban landscape based on Lynch's theory and using the cognitive map, placement, and recognition of the places and activities, and emphasized the landmark more than other factors (Savage & Henry, 1996). Negro (2003) studied citizens' mental image of the environment and proposed the landmark as the most significant element in the cognitive maps. He

stated that the more contrast between the front edge of the buildings with the street as background, color, and façade elements affected the creation of the citizens' mental image (Negro, 2003). De Certeau stated that perceptual maps were made from a combination of landmarks, personal settings, good speculations, and normal and repetitive paths (Tannicus, 2011, p. 201). Many studies showed that urban landmarks played a major role in the perceptual mapping process. Urban landmarks require that urban elements evoke a common meaning in the minds of most of the city's residents. This criterion is called implicit significance. That said, every element with the maximum frequency in the perceptual maps might obtain the social aspect more than other urban elements. In a book entitled "The Evolution of Cognitive Maps" written by Bella H. Banathy, the cognitive maps were interpreted as a schema that individuals, groups, organizations, and communities create and use to observe, understand, and represent perceived phenomena in the world. (Roberts, 2003, p. 9). In general, mental maps can be interpreted as simplified reality.

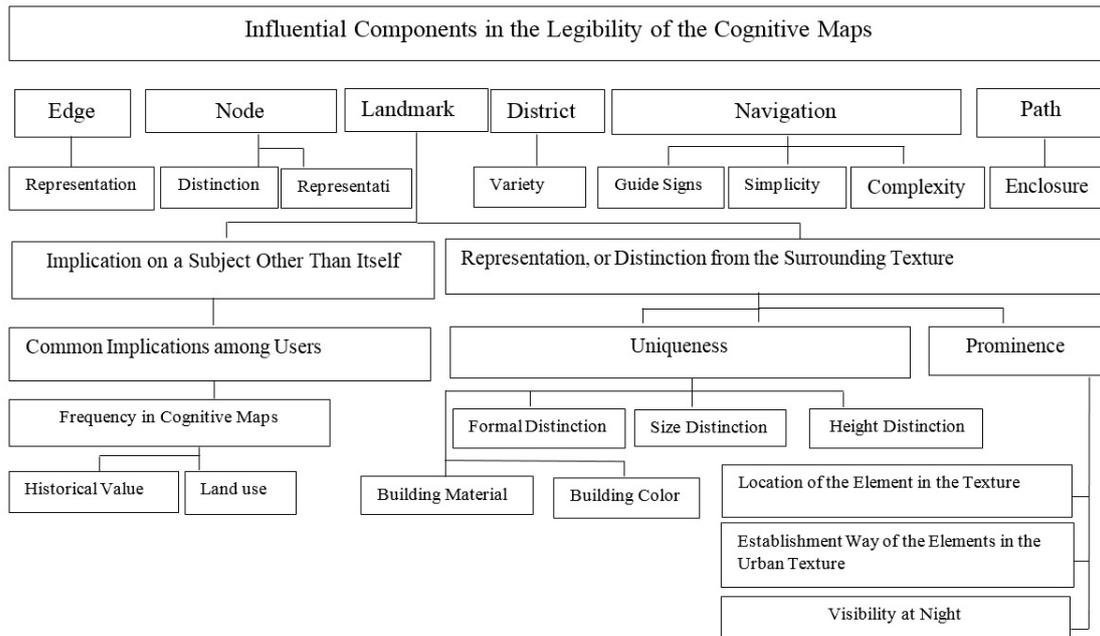


Fig. 1. Influential Components in the Legibility of the Cognitive Map
(Tarkashvand & Majid, 2013; Biniyazi & Hanai, 2016)

To the comparative comparison of the physical identity and cognitive maps in four districts of the Davachi neighborhood and based on the determined indices in Table 2, the influential components in the physical identity of the neighborhood were selected in terms of significance and more frequency as follows: distinction from the other and similarity with self, maintaining the continuity while evolving, maintaining unity in plurality, historical value, being vernacular (contextualism), being distinctive, welcoming, design, form and architecture, spatial enclosure, façade, legibility, skyline and wall, mixed land uses, elements of landmark, the distinction with the context, similarity, and proximity. Then, the components were scrutinized using an interview with the experts through the snowball method, and the indices were defined for the components. The components are as follows: historical value, distinction, representation, variety, enclosure,

and integration. Each component enjoys indicators. Historical value (age, uniqueness, relationship with the history of its residents), distinction (different materials, size, and height, color while having a local identity), representation (legibility, Ability to identify the surrounding urban context), variety (variety of the activities, the accessibility to the surrounding urban space, compatibility in the homogeneity), enclosure (proportions of the height, dimension, having human scale), integration (enjoying proper material, proper color, and proper texture body). By identifying the cognitive maps through overlapping the mapped cognitive maps, the studied components, including path, node, district, landmark, navigation, were investigated based on Figure 1 and the perceptual, social, physical, and functional features. Then, their representation and distinction were extracted in four districts of the neighborhood.

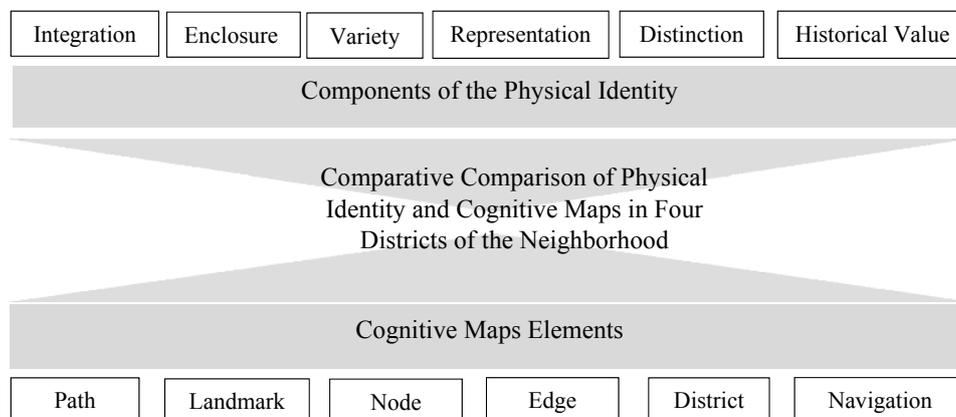


Fig. 2. Research Model

3. STUDIED AREA

Davachi neighborhood, as one of the central neighborhoods of Tabriz located in District 10, is one of the historical and large neighborhoods of Tabriz. This neighborhood is limited to Einali mountain from the north, to Mehranrood from the south, to Sorkhab neighborhood from the east, and Amirkhiz neighborhood from the west. A large area of this neighborhood has been renovated over the past ten

years and is still being renovated. This has led to the emergence of two different types of texture in the neighborhood so that the old architecture of the neighborhood has been combined with the modern and new architecture of the neighborhood. According to Figure 3, the neighborhood has been divided into four districts based on the main arterial routes, Davachi 1, Davachi 2, Davachi 3, and Davachi 4, according to Tabriz's new development plan (Master Plan).

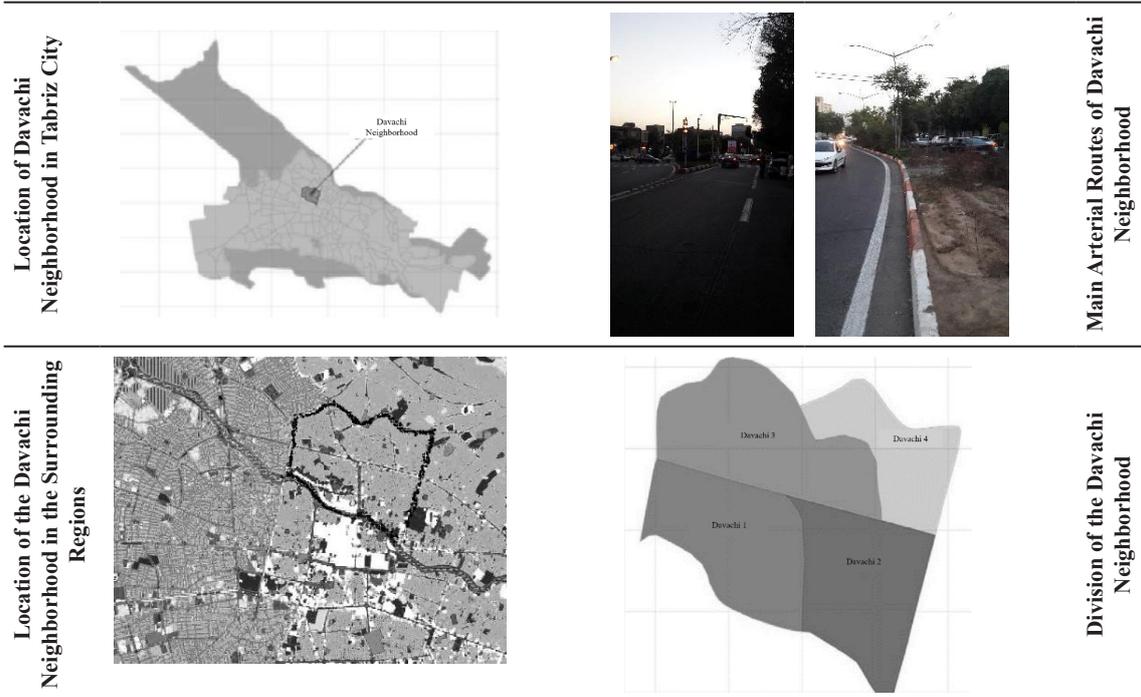


Fig. 3. Location of the Davachi Neighborhood in Tabriz City and Surrounding Regions

According to Table 4, field research based on the interview and observation was conducted in the four districts of the Davachi neighborhood, considering the influential factors in the physical aspects of the current situation. The proximity of the historical texture and

new texture and their combination in the process of renovation of this neighborhood provides the possibility of investigating the physical identity based on the residents' cognitive maps in four districts of the neighborhood and their comparative comparison.

Table 4. Field Study of the Four Districts of the Davachi Neighborhood Based on the Current Situation of the Physical Aspects

Four Districts of the Neighborhood	Davachi 1	Davachi 2	Davachi 3	Davachi 4
Physical Components				
Skyline	Balanced skyline and respecting the human scale in the area	Lack of balanced skyline and human-scale considering the implemented high-rise constructions	Relatively balanced skyline and respecting the human scale	Lack of balanced skyline and respecting the human scale
	 		 	

Four Districts of the Neighborhood	Davachi 1	Davachi 2	Davachi 3	Davachi 4
Physical Components				
Age and Historical Value	Preserving the historical texture in the area 	Renovation of the buildings and destruction of the historical texture 	Preserving the historical monuments and renovation 	Destruction of the historical monuments and complete renovation 
Accesses	Transforming the historical routes into the parking lots 	Narrow and winding routes 	Easy access to the internal and external spaces of the area 	Proper accesses inside the area 
Furniture	Lack of Bus Stations, Improper Pavements, Lack of Red Lights, Lack of Proper Placement of The Trash Bins 	Lack of proper furniture to sit in the area of people's gathering in the sidewalks 	Low quality of the bus stations, Improper pavements 	Low quality of the signs of the routes, Garbage disposal system 
Texture of Body	Highly distressed texture in the area and improper materials 	Lack of harmony in the texture of the walls given the implemented renovations 	Consistency of the walls and use of vernacular materials 	Use of improper materials and graffiti in the area 
Vegetation	low scale defined green space for the residents' use 	Lack of proper vegetation for shading and residents' use 	The defined green space as the edge and not used by the residents 	Planting trees in the main walls and lack of green space and park in the area to use 

The valuable and historical monuments of the neighborhood area as follows: Saheb Al-Amr Mosque, Shakelli Mosque, Pottery Museum, Seyyed Ibrahim Shrine, Hammal Shrine, Mosque Kashilar, Arablar Mosque, Haj Aqababa Mosque, etc. These precious buildings are a part of the most significant visual

landmarks in the neighborhood so that most people use these valuable monuments to give the address and navigate. Figure 4 shows the location map of the prominent places in the four districts of the neighborhood.

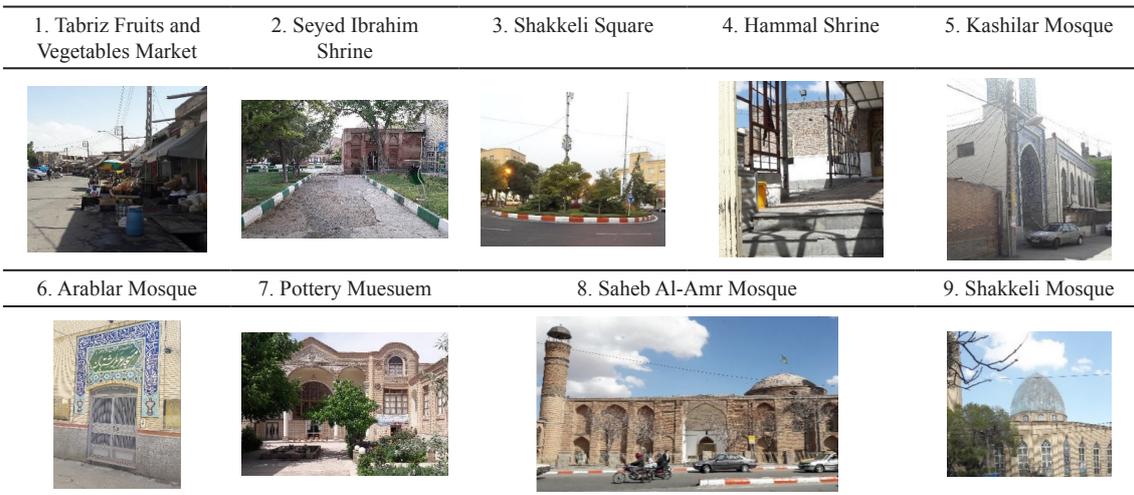


Fig. 4. Prominent Physical Elements in the Davachi Neighborhood

4. RESEARCH METHOD

The current study was analytical-descriptive research based on field observations. The library-documentary method was used to collect the concepts related to the subject, and eventually, the indicators were presented to study each component. Then, the required data were collected after field observation and evaluation of the situation of the neighborhood and using the questionnaire and cognitive technique of mapping. The statistical-quantitative data were investigated using the comparative-qualitative method in the four districts of the neighborhood.

In the current research, in the section of codifying the citizens' cognitive maps, the data were collected using croquis drawing and interview. Foddy formula was used for sampling, and the sample size was obtained 384. The residents of the Davachi Neighborhood in the age range of 20-86 years old were randomly asked to draw a croquis based on their mentality. They were demanded to specify the name and location of the elements on a simplified map of the neighborhood that have the maximum effect in identifying and forming a clear mental image of the neighborhood. To deduce the perceptual similarities, the sketched croquis was studied according to the frequency of mentioning the

elements to prioritize the four districts of the Davachi neighborhood based on using the elements of the cognitive maps

To study the components of the physical identity, the statistical population included 250 with a sample size of 151, including urban management and planning, academics, consultant engineers, municipality, and roads and urban development experts who were familiar with the neighborhood. The error value of the sample size was 5%. Cochran's model was used to determine the sample size. The AHP model was applied to prepare the questionnaire, and the five-point Likert Scale was utilized to complete it. First, a hierarchy tree was mapped based on determining the criteria and indicators of the physical identity according to the research model. Then, each criterion and indicator was compared in a binary matrix. The obtained data were normalized to calculate their significance. The purpose of normalizing is to unify the scales. The inconsistency value of each matrix was calculated (based on Professor Saaty's method, 0.1 is the acceptable value). Finally, the importance coefficient of the indices and criteria to the physical identity, the priority of the four districts of the neighborhood to each indicator, and criterion of the physical identity were identified. Therefore, the final

normal weight of the physical identity and prioritizing of the four districts of the Davachi Neighborhood (Davachi 1, Davachi 2, Davachi 3, and Davachi 4) were investigated using them.

5. RESEARCH FINDINGS AND DISCUSSION

After investigating the current situation, the relationship

between the cognitive maps and physical identity in the four districts of the Davachi Neighborhood was studied using croquis sketching and a questionnaire. By examining the croquis drawn through overlapping, the number of references to the elements of cognitive maps per four districts was indicated in Table 5. The age group of the people to draw croquis was 20-86 years old.

Table 5. The Results Obtained From Investigating the Croquis

Cognitive Maps of the Elements	Landmark	Path	Edge	District	Node	Navigation
Four Districts of Neighborhood						
Davachi 1	98	45	16	41	83	18
Davachi 2	39	28	3	23	31	6
Davachi 3	185	73	29	45	46	37
Davachi 4	43	69	5	18	16	10

According to the extracted data and analysis conducted in the Expert Choice Software, the importance coefficient of the influential elements of the cognitive maps in creating the mental images and identifying the Davachi neighborhood were prioritized. According to Table 6 regarding the prioritizing the four districts of

the Davachi neighborhood in allocating the elements of the cognitive maps, Davachi 3 with the normal weight of 0.363, Davachi 1 with the normal weight of 0.314, Davachi 4 with the normal weight of 0.195, and Davachi 2 with the normal weight of 0.128 had the maximum score, respectively.

Table 6. Ranking of the Four Districts of the Davachi Neighborhood Based on the Elements of the Cognitive Maps

Four Districts of the Neighborhood	Davachi 1	Davachi 2	Davachi 3	Davachi 4
The Final Normal Weight of the Cognitive Maps Elements	0.314	0.128	0.363	0.195

According to Table 7 and Figure 5, three landmarks with the normal weight of 0.444 in Davachi 3, node element with the normal weight of 0.445 and 0.141 in Davachi 1 and Davachi 2, path element with the normal weight of 0.391 in Davachi 4 obtained the highest score. Also, three nodes with the normal weight of 0.263 in Davachi 3, the path with the normal weight of 0.195 in Davachi 1, a landmark with the normal weight of 0.104 in Davachi 2, edge with the normal weight of 120 in Davachi 4 achieved the lowest score. Accordingly, by comparing the cognitive maps in four districts of the neighborhood (Davachi 1, Davachi 2, Davachi 3, and Davachi 4), it can be concluded that every element with the highest frequency in the cognitive maps could obtain the social aspect more than other urban elements. Therefore, it was considered as the social were with more memories and an urban landmark in the mind of many of the citizens. Given that the public land uses (nodes, green space, health, religious, and cultural

monuments and alike) deal with the broader group of residents, they have more potential to recognize in the citizens' minds. Also, the longer the duration of the presence of an element in the urban space, the more it is possible for the historical land use to become one of the fixed and reliable elements in the residents' mental image. The presence of three historical and prominent monuments, such as Saheb Al-Amr mosque, Pottery Museum, Shakelli Mosque, as the landmark in Davachi 3, the presence of the historical squares, public spaces, and more social interactions, valuable and memorable elements due to the age and the center of the events, such as Meydan-e Kah (Kah Square), Fruit and vegetables market (Tar-e Bar Square), Seyer Ibrahim Park, Seyed Ibrahim Shrine, and Shakelli square as the node, were among the influential factors. These factors led to the more successful function of Davachi 3 and Davachi 2 to form the mental images based on the cognitive maps than Davachi 2 and Davachi 4.

Table 7. Ranking the Elements of the Cognitive Maps in Four Districts of the Davachi Neighborhood

Elements	Landmark	Path	Edge	District	Node	Navigation
Four Districts of Neighborhood						
Davachi 1	0.311	0.195	0.312	0.333	0.4450	0.246
Davachi 2	0.104	0.138	0.122	0.140	0.141	0.135
Davachi 3	0.444	0.276	0.439	0.333	0.263	0.431
Davachi 4	0.146	0.391	0.120	0.200	0.141	0.189

According to Table 8, investigating the effectiveness of each element of the physical identity in the four districts of the neighborhood indicated that legibility and representation with the normal weight of 0.436

in Davachi 3, historical value with the normal weight of 0.409 in Davachi 1, and distinction in the physical elements with the normal weights of 0.294 and 0.270 in Davachi 2 and Davachi 4 obtained the highest score.

Table 8. Weight of the Components of the Physical Identity in the Four Districts of Davachi Neighborhood

Weight of the Elements Four Districts of Neighborhood	Value of Historical	Distinction	Representation	Variety	Enclosure	Integration
	Davachi 1	0.409	0.223	0.307	0.414	0.292
Davachi 2	0.101	0.294	0.125	0.134	0.130	0.186
Davachi 3	0.347	0.213	0.436	0.250	0.384	0.387
Davachi 4	0.143	0.270	0.131	0.202	0.194	0.267

According to Table 4, the following indicators in Davachi 3 played a significant role in the physical identity of this district of the neighborhood: legibility indicators, including the possibility of identifying the surrounding urban texture, proper materials, color, and texture of the body, proportions, height, size, and human scape, age, including the uniqueness of the buildings (Saheb-al Amr Mosque, Pottery Museum), relation to the history of the residents, representation, integration, enclosure, and historical value. The indicators of the neighborhood's age (0.459), relation to the history of the residents (0.414), the accessibility to the surrounding space of the city (0.458), having human scape (0.333), the possibility of distinguishing from the surrounding urban texture (0.312) in Davachi 1 had the highest score. Given that Davachi 1 has an old texture and its buildings have been renovated less than other districts, it obtained the lowest score regarding the quality of the texture of the body and proper materials. Also, the following were the most important factors in giving the identity to Davachi 1: the collective spaces (node) as the ceremonial squares to hold the ceremonies, diversity, and distribution of various land uses, more residential land use, and respecting the

human scale, respecting the skyline, the components related to the history of its residents, variety of the activities, the accessibility to the surrounding urban space, legibility, including the possibility to distinguish from the surrounding urban texture, historical value, representation, variety of the activities and function. The following indicators obtained the minimum score in Davachi 2 and Davachi 4: the oldness of the area with the scores of 0.093 and 0.143, uniqueness with the scores of 0.138 and 0.179, relation to the history of the neighborhood and its residents with the scores of 0.094 and 0.134, the possibility to distinguish from the surrounding texture with the scores of 0.122 and 0.122, proportions with the scores of 0.116 and 0.185, respecting human scale with the score of 0.191. It was due to the lack of possibility to distinguish, representation, distinction from the surrounding texture as the powerful semantic landmark of the components of the identity value, historical value, enclosure due to violating the human scale and skyline. Also, the lack of proper furniture and places for people's interactions and reduction in environmental diversity have decreased the memorability and physical identity of these districts of the neighborhood.

Table 9. Weight of the physical identity indicators in the four districts of the Davachi Neighborhood

Weight of the Indicators Four Districts of Neighborhood	Historical Value			Distinction		Representation		Variety			Enclosure		Integration		
	VH1	VH2	VH3	D1	D2	R1	R2	V1	V2	V3	E1	E2	I1	I2	I3
Davachi 1	0.459	0.320	0.414	0.163	0.333	0.295	0.312	0.472	0.458	0.333	0.240	0.330	0.135	0.228	0.120
Davachi 2	0.093	0.138	0.094	0.363	0.167	0.135	0.122	0.256	0.185	0.333	0.116	0.140	0.175	0.205	0.191
Davachi 3	0.305	0.363	0.358	0.148	0.333	0.414	0.444	0.108	0.116	0.167	0.458	0.330	0.383	0.383	0.418
Davachi 4	0.143	0.179	0.134	0.326	0.167	0.157	0.122	0.164	0.240	0.167	0.185	0.200	0.307	0.169	0.271

According to Table 10, conducted studies showed that factors such as historical value, texture variety, local texture integrity, representation and legibility,

distinction in unity, enclosure, proportions, and human scale, respectively, were more influential in giving identity to the body of the neighborhood.

Table 10. Ranking of the Components of the Physical Identity

Components of the Physical Identity	Historical Value	Variety	Integration	Representation	Distinction	Enclosure
The Normal Weight of the Components	0.263	0.193	0.180	0.132	0.128	0.104

Regarding the prioritization of the four areas of the Davachi neighborhood, according to Table 11, Davachi 3 with the final normal weight of 0.342, Davachi 1 with the normal weight of 0.305, Davachi 4 with the normal

weight of 0.194, and Davachi 2 with the normal weight of 0.157 obtained the highest score, respectively, based on the final normal weight of the physical identity.

Table 11. Ranking the Final Normal Weight of the Physical Identity in the Four Districts of the Davachi Neighborhood

Four Districts of the Neighborhood	Davachi 3	Davachi 1	Davachi 4	Davachi 2
The Final Weight of the Physical Identity	0.342	0.305	0.196	0.157

6. DISCUSSION AND CONCLUSION

Comparison of the results of studies on cognitive maps and physical identity of Davachi neighborhood according to Figure 5 showed the corresponding trend and significant relationship between the components

of physical identity and cognitive maps in Davachi 3, Davachi 1, Davachi 4, and Davachi 2, respectively and represented a direct relationship. Also, it indicated the importance of analyzing cognitive maps in regenerating the physical identity in the four districts of the Davachi neighborhood.

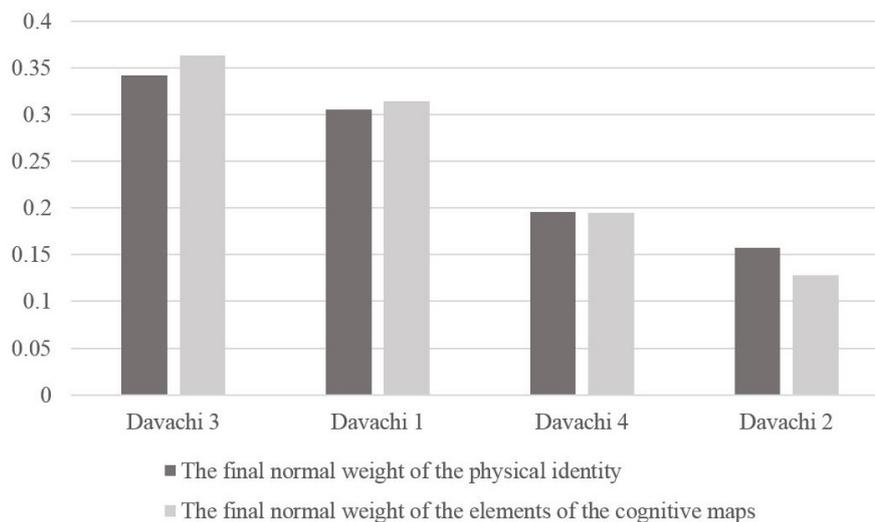


Fig. 5. Comparative Comparison of the Cognitive Maps and Physical Identity in the Four Districts of the Davachi Neighborhood

According to the analysis of the elements of cognitive maps based on Table 7, landmark, node, navigation, path, edge, and district have been prioritized in the formation of mental images and physical identity of the neighborhood, respectively. In Davachi 3, historical monuments, lack of complexity, and a clear spatial area, Mehranrood river road, landmark elements, navigation, edge, respectively, have had the highest effect on the formation of mental images of this area. In Davachi 1, historical squares, public spaces, more social interactions, were recognizable. In this district with an old texture, the node and the district have had the highest score. In Davachi 2 and 4, due to the complete renovation, an almost uniform texture has been created, in which the elements of cognitive maps in these two districts of the neighborhood are weaker than Davachi 3 and 1 to form mental images. The

analyses indicated an upward trend of the effect of the elements of cognitive maps in the formation of mental image in the four districts of the neighborhood that is as follows: Davachi 2, Davachi 4, Davachi 1, and Davachi 3, respectively. According to Tables 9 and 10, the weights depended on the share of the criteria and indicators of the physical identity of the neighborhood. The quantitative findings showed that the factors, such as historical value, variety of functions, integration of the local texture, representation and legibility, distinction in unity, enclosure, proportions, and human-scale had the maximum effect on the physical identity of the neighborhood. Legibility, historical value, representation, integration, and enclosure in Davachi 3 played a significant role in the identity of the district of this neighborhood. Historical value, representation, variety of activities and functions in Davachi 1 have

been the most significant factors in the physical identity of this district. Due to the destruction of the historical monuments and complete renovation in Davachi 2 and 4, the historical value, uniqueness, identity value, enclosure have had the minimum score due to violating the human scale and lack of maintaining the skyline. The prioritization of the four districts of the neighborhood has had an upward trend using the components of the physical identity that is as follows: Davachi 2, Davachi 4, Davachi 1, and Davachi 3, respectively. According to the corresponding trend of the elements of the cognitive maps in the formation of the mental images with the components of the physical identity in the four districts of the neighborhood, Davachi 3 and Davachi 1 have acted better to form the mental images based on the elements of the cognitive maps and preserving the physical identity than Davachi 4 and Davachi 2, considering the preservation and maintenance of the

historical texture and old buildings, and the relatively favorable quality. It is noteworthy that since legibility is one of the functions of the identity, the constituent elements of the mental image in the cognitive maps can lead to legibility. The continuity of the elements of the cognitive maps of the neighborhood over history has represented a part of the physical identity of each neighborhood through legibility. It can provide the ground for the future development and growth of the neighborhood. Therefore, the elements of the cognitive maps have contributed to the continuity of the neighborhood's identity through the association of the common meanings and concepts among different generations. In any scale and type, they could establish a deep and explicit relationship with the audience and become a part of the physical identity, and consequently, the citizens' personal identity.

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HOW TO CITE THIS ARTICLE

Balali Oskoui, A., Gharebaglou, M., & Heydari Torkamani, M. (2021). Investigating the Constituent Elements of Physical Identity Based on the Citizens' Cognitive Maps; Case Study: Davachi Neighborhood of Tabriz. *Armanshahr Architecture & Urban Development Journal*. 13(33), 25-38.

DOI: 10.22034/AAUD.2019.176147.1834

URL: http://www.armanshahrjournal.com/article_127655.html

