

RESEARCH ARTICLE

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# Investigating the relation between emotional and cultural mapping by considering collective memory in Urban design from perspective of citizens (case study: Tehran, Iran)

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## Abstract

Perception of Citizens about a city is an essential issue in urban planning. Hence, having an understanding of the people's perception can help designers improve city planning. This study aimed to discover the emotional and cultural parameters of urban places by considering the collective memory of citizens. The main gap in the studied subjects was the lack of a combination of cultural and emotional mapping from the perspective of citizens. To fill the mentioned gap, the findings of this study emphasize the importance of engendering emotions and cultural mapping in the citizens in urban spaces. Respectively, a quantitative method was conducted through a comprehensive case study in the form of a questionnaire. Results indicated that emotional mapping is more important than cultural mapping for collective memory. Moreover, emotional parameters were substantial to female participants as cultural factors were for male respondents. Same as gender, Level of education, and age were two factors that affect cultural mapping or emotional mapping choices. Besides, pride, a sense of power, pleasure, excitement, peace, compassion, vitality, and happiness were found important emotions in this study. Our findings revealed that designing urban places based on the culture of each society has a significant role in engendering emotions and drawing the interest of citizens.

**Keywords** Emotional mapping, Citizens' perspective, Collective memory, Cultural mapping, Urban space

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## Introduction

In contemporary times, with the ongoing physical evolution of cities and the expanding scope of human communication within urban spaces, there is a growing emphasis on residential areas. These areas are increasingly recognized as pivotal aspects in the overall organization and planning of cities (Norouzi Zadeh et al. 2021). The perception of a metropolis stands as a pivotal concern within the realm of urban planning. Therefore, acquiring a profound comprehension of the populace's perceptions becomes instrumental for designers in refining city planning (Zeile et al. 2015). Underlining the profound impact of user participation in design, Kahila-Tani (2015) articulates that when embarking on a new project, due regard must be given to local insights, foundational information, and communicative endeavors to amass data. The incontrovertible significance of user involvement as a pivotal determinant in urban design has led to the development of numerous software applications dedicated to the aggregation of citizens' opinions (Haklay et al. 2018). Simultaneously, engagement in cartography empowers designers and urban planners to make judicious decisions dynamically regarding the expectations of the denizens residing in a city (Kloeckl et al. 2011). Viewing citizens as founts of data influencing urban planning yields advantages for cities, as evidenced by the work of Fathullah and Willis in 2018. Furthermore, Askarizad and Safari (2020) substantiate that, beyond the impact of individuals on urban spaces, careful attention to citizens' behaviors and their active involvement in the design process is imperative. The assimilation of ideas and perspectives from the public, coupled with an attentive observation of their emotional responses to spaces, can empower urban designers to craft more profound and enduring environments for the populace, as illustrated (Jahanbakhsh et al. 2015). Given the paramount significance of citizens' involvement in urban planning, the amalgamation of cultural and emotional mapping often finds itself overlooked within the existing literature. The majority of studies tend to concentrate solely on either emotional or cultural mapping. Similarly, it is imperative to discern the parameters that contribute to the creation of a memorable space. Hence, in this inquiry, we delve into the interplay between cultural and emotional mapping, elucidating the essential parameters that foster the establishment of spaces that leave a lasting imprint on the collective memory. The main problem of this research is finding the difference between cultural and emotional mapping based on creating collective memory? How they can be contributed to each other in order to achieve the sustainable architecture? And therefore, the main aim is determining the emotional and cultural parameters of urban places by considering the collective memory of citizens.

## Literature review

Emotions can be acknowledged as a pivotal parameter in delineating the distinctive features of spaces and places, despite not having received adequate attention (Griffin and McQuoid 2012). The foundational concept underpinning emotional mapping posits that places, emotions, and spaces are intrinsically interconnected. Emotions are regarded as integral facets denoting the human presence on maps and contributing to the definition of humanity itself (Griffin and McQuoid 2012). They significantly influence a certain place and the spatial distribution of the perceptions (Zadra and Clore 2011; Ilbeigi et al. 2019a). Various studies have affirmed that emotions manifest along dimensions of pleasantness-unpleasantness and on axes of high and low arousal (Barrett 2006; Johnmarshall Reeve 2018; Ilbeigi et al. 2019b). In a separate study, emotions were delineated as relational currents flowing between individuals and the spaces, they inhabit (Davidson et al. 2012). Specifically, places can be sensed or felt as beautiful, boring, dangerous, or scary (Korpela et al. 2002). Based on the findings of (Johnmarshall Reeve 2018), Emotion is encapsulated within the realms of feeling, cognitive processes, bodily arousal, and behavior. Within the domain of urban planning, establishing a connection between the built environment and users' behavior and emotions is recognized as a pivotal factor enhancing the quality of life (Raslan et al. 2014a). Cities abound with spaces that evoke feelings and memories among their inhabitants. Moreover, cities possess the capacity to actively contribute to the formation of dynamic emotional qualities associated with a place (Deitz et al. 2018). In cultural backgrounds, a participatory approach allows people to be engaged with cultural creativities as co-designers, a subject that remains unexplored (Biondi et al. 2020). To make nodes memorable, cultural mapping that makes the memories, local stories, and meanings of places visible should be developed (Inquiry et al. 2016). Several studies have presented a design framework that attaches values, meanings, and stories to places using cultural mapping (Evans and Foord 2008; Roberts 2012; Inquiry et al. 2016; Xu et al. 2020). Studies reported that meanings of places could make them memorable in the mind of citizens (Eräranta and Moisander 2011; Eräranta et al. 2016). The attachment of meaning, experiences, and emotions to a place can be recognized as a key parameter (Cresswell 2014).

According to the results of (Eräranta et al. 2016), cultural studies are focused on people, places, and history. In the category of place, architecture, everyday life, and links to the surroundings should be considered. In the category of history, events, octants, and stories are at focus. The category of people involves expectations, social networks, and experiences. Moreover, it has been proved that cultural participation in urban planning

provides notable societal and economic welfare (Blessi et al. 2016). The realistic pieces of evidence presented by another study revealed that space played a fundamental role in validating cultural enterprises and considering cities as communal and participatory spaces (Sacco et al. 2019). (Freitas 2016) stated that cultural mapping represented an attempt at injecting and inscribing culture into a place to make its design sustainable. Accordingly, cultural mapping can be identified as a sense and meaning of a place (Savić 2017). Unlike, several related studies of collective memory and urban spaces such as museums, monuments, and landscapes have been conducted (Till 2003; Henneberg 2004; Binder 2012). Furthermore, researchers have tried to propose an approach to making a connection between memories and places (Uğuz 2008; Stangl 2008). Improving the identity and meaning of places, experiences, and activities of people as well as creating a sense of belonging and participation are the recognized methods in the domain of collective memory (Uğuz 2008). Also, (Lak and Hakimian 2019) demonstrated that to form a coherent collective memory, places, history, and activities or events should all be included.

De Leão Dornelles et al. (2020) investigated the relation between place and memory by using the qualitative method. The results showed that social memory and identity are intertwined. In this regard, Gurler and Ozer (2013) intended to assess the effect of social memory and urban identity on public places. The outcomes revealed designing a memory landscape has an affirmative influence on urban identity. Moreover, collective memory in urban spaces was assessed in another research. The qualitative method was used and analyzed based on content analysis. Results illustrated that collective memory has two objective and subjective dimensions. Besides, cultural parameters have been shown a significant effect on collective memory (Lak and Hakimian 2019). Also, the research was conducted the examination of the connection between place attachment (PA) and social participation (SP) within residences, the mediating function of social cohesion plays a pivotal role (Bayat et al. 2022). The result demonstrated that the model demonstrated a satisfactory level of fit with the study data, indicating that the index's magnitude, determining the impact of PA on SP, stands at approximately 25.6%. Additionally, outcomes

derived from path analysis suggest that the SC variable not only serves as a mediator but also functions as a catalytic facilitator in the correlation. It elevates the relational strength between PA and SP by 16%, resulting in a cumulative impact of 41%.

Deitz et al. (2018) tried to participate young people in urban design based on the emotional mapping. Results demonstrated that young people felt light emotions such as happiness, excitement, and pride due to their optimistic point of view. Besides, a sense of nostalgia was an important factor for participants and cultural parameter has a significant role to create safe places. In another research, Weinreb and Rofè (2013) assessed the citizens' emotional response to urban places. Results demonstrated that citizens' feeling was influenced by various physical properties and place characteristics. Furthermore, another study revealed that people preferred the cultural area of cities. Also, age, ethnicity, religion, and gender were effective parameters on emotional mapping (Shoval et al. 2018b).

Regarding cultural mapping, Eräranta et al. (2016) evaluated the cultural mapping of place with user interaction. The result suggested multidisciplinary design background to improve user response and cultural activities in cities. Aliyah et al. (2017) used a qualitative method to consider spatial flexibility in cultural mapping. The outcomes showed the flexible spatial characteristics of cultural mapping caused a sense of place. Additionally, another research investigated the sense of the city and cultural mapping. Cultural Results presented that user participation in urban designing can increase the sense of place. Moreover, there is a link between place and people's memories and their preferences (Savić 2017). Table 1 demonstrated the emotional mapping parameters in different researches. According to literature, The main gap in the studied subjects was the failure to integrate cultural and emotional mapping. Given the complexity of local culture in Iran along with the dominance of rituals, religion, urban texture, and race, investigating the emotional and cultural mapping in the country would lead to different results. Therefore, the novelties and objectives of this research are clarified as follows:

**Table 1** Emotional Parameters

Researchers	Emotional Parameters
Barrett (2006)	Anger, Sadness, Disgust, Fear, and Happiness
Li et al. (2016)	Intense Pleasantness  Intense Unpleasantness  Mild Pleasantness  Mild Unpleasantness
	Astonishment, Excitement, Amusement, Happiness, Delightfulness, Glad and Pleasantness  Fear, Alarm, Anger, Tense, Frustration, Annoyance, and Distress  Content, Satisfaction, Serenity, Calmness, Ease, and Relaxation  Sleepiness, Tiredness, Misery, Sadness, Depression, Gloom, Bore, and Droop
Deitz et al. (2018)	Happiness, Content, Excitement, Thoughtfulness, Pride, Anxiety, Surprise, Fear, Sadness, Anger, Depression, and Threat

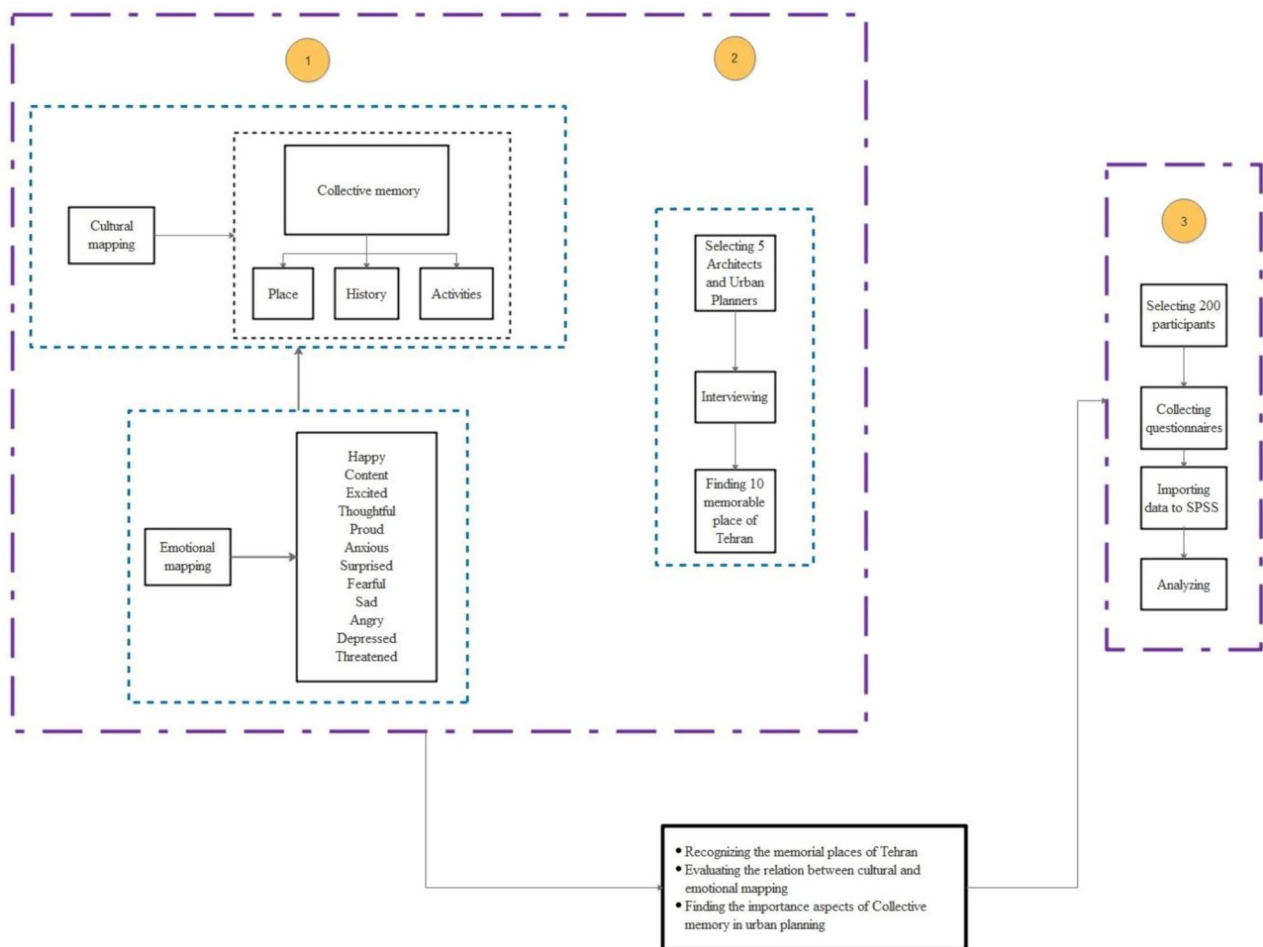
- Scrutinizing the relationship between the cultural and emotional mapping;
- Investigating the significant parameters of collective memory in urban areas;
- Recognizing the role of Citizens in urban design to make a space notable;
- Finding the relationship between the youth and the elderly participating in emotional and cultural mapping;
- Investigating the relationship between participants' educational level and their mapping.

**Methods and materials**

A quantitative method was employed in this research. This study aimed to investigate the relation of emotional and cultural mapping by considering collective memory. To find memorable places in Tehran, an interview with five architects and urban planners was conducted. The number of architects and urban planners was adequate based on (Ilbeigi et al. 2019a). Subsequently, ten places

were selected and chosen. Afterward, a survey was conducted by a Likert-base questionnaire among 200 random participants. The employed method in this paper is shown in Fig. 1.

Tehran is the capital of Iran and one of the largest and most populous cities in the world with a population of around 14 million. The city has more than half of the country's basic industries as well as many theaters, historical places, parks, and museums. Tehran is known for the juxtaposition of 'deep-seated tradition and wild modernity.' The urban spaces of Tehran are struggling with overwhelming practical significance and the authority/priority of business objectives. Thus, the corresponding effect is the decline of cultural and social functions of Tehran's urban space in the evolving process from outdated to contemporary (Lak and Hakimian 2019). Therefore, Tehran is a significant choice for studying mapping and urban planning. Consequently, based on the results of conducted interviews, Tajrish Square, Vanak Square, Imam Khomeini Square, Mashgh Square, Masoudieh Palace, Tehran Bazaar, Sardar e Baghe Meli, Carpet



**Fig. 1** The employed methodology

Museum of Iran, Saadabad Complex, Tochal Complex, and Museum of Time have been studied which is shown in Fig. 2 Table 2 demonstrated the description of the chosen places.

A questionnaire survey was conducted during the summer, involving 200 sampled respondents. The sample respondents were selected from tourists in Tehran who visited all the designated locations. Furthermore, the participants in the study encompassed individuals with varying levels of education, ranging from a diploma to a Ph.D. A multistage probability sampling method was utilized, employing both hard copies and online surveys. The selection of the summer season was based on favorable weather conditions and a high frequency of visits. Table 3 shows a review of descriptive statistics of review participants such as age, sex, education, and the living district. The age category is chosen based on the Ghomeshi and Jusan (2013) research and did not impact the outcomes of the research. The parameters utilized in the provided questionnaire were derived from Table 1 in the literature review. These parameters were presented in both open-ended and closed-ended questions.

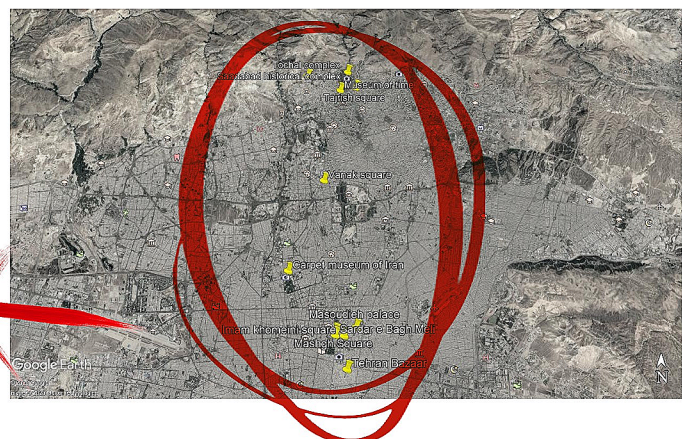
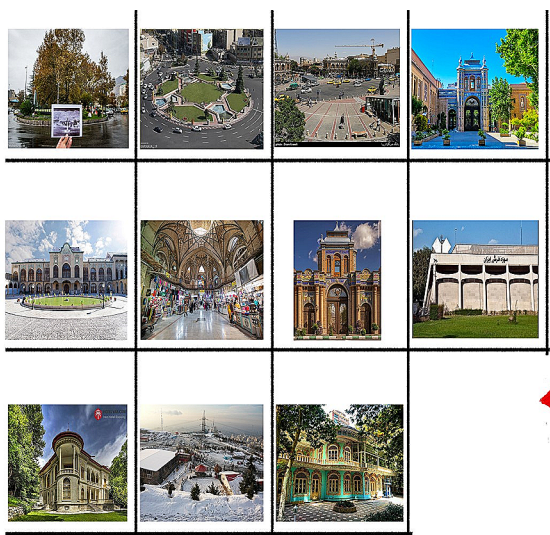
Gathered data was analyzed statistically by SPSS (version 24). Assessing the considered parameters, Sample T-test was conducted. Also, to find the differences in participants' responses based on their gender, Chi-square test was performed. Furthermore, Pearson Correlation is employed to assess the relation among some factors such as preference and place attachment. Finally, ANOVA test was employed to consider the differences in citizens' perceptions based on their gender.

## Results

To achieve satisfying reliability, Cronbach's alpha test was used with an outcome of 0.702. According to conducted research, the result above 0.7 counts as reliable and acceptable (Ilbeigi et al. 2019a).

To find the relation among preference, sense of place, feelings of peace, and place attachment, Pearson correlation was conducted. As can be seen in Table 4, all four factors are correlated to each other. Moreover, preference is more related to the sense of place (0.493) and place attachment (0.405). Based on Fig. 3, Saad Abad Palace was selected with higher preference, sense of place, and sense of peace ranking. Although, the rank of place attachment was higher in Tajrish square. The finding showed that Place attachment had different emotional parameters than preference, sense of place, and feeling of peace. Table 5, showed the found emotional parameters. Proud, Fascinated, Excited, Curious, Thoughtful, Relaxed, Nostalgic, Relaxed, Compassionate, Energetic, Pleased, Peace and Happy were emotional parameters that were important to citizens.

To examine the founded parameters, a One-Sample T-test was conducted. Results indicated that Identity of place, Antiquity, a place with creating Feel of peace and happiness and thrill, user satisfaction, occurring events in the place, Accessibility to malls, Being Cultural and Sense of Place were all parameters relevant and important to participants (Table 6). Moreover, considering the mean difference of Table 6, satisfaction, feeling of happiness and thrill, and feel of peace were the most impressive factors which make places memorable. Therefore, emotional mapping is more important than cultural mapping for collective memory. According to Fig. 4, positive energy of spaces with 52%, historical places 24%, space identity 14.5%, facilities 7.5%, and accessibility 2% were



**Fig. 2** Studied places in Tehran

**Table 2** description of the chosen places

	Dominant Uses	Striking Events	Importance
Tajrish Square	Tajrish Square serves as a bustling commercial and cultural hub in Tehran. It features a vibrant bazaar, shops, restaurants, and a mosque	While not a specific event, Tajrish Square is known for its role as a gathering place during various cultural and political occasions.	The square holds historical and cultural significance, and its lively atmosphere makes it a popular destination for locals and tourists alike
Vanak Square	Vanak Square is a commercial and business center, featuring shopping centers, office buildings, and restaurants.	Over the years, Vanak Square has witnessed various urban developments and changes, reflecting Tehran's economic growth.	As a central business district, Vanak Square is crucial for economic activities and contributes to the city's modern urban landscape.
Imam Khomeini Square	This square is a significant public space featuring religious establishments, government buildings, and cultural institutions.	It has been a focal point for religious gatherings, political demonstrations, and commemorations related to the Islamic Republic.	Named after the founder of the Islamic Republic, Imam Khomeini Square is a symbol of religious and political identity in Iran.
Mashgh Square	Mashgh Square is primarily a sports and recreational area, often used for public exercises and gatherings.	It has hosted various sports events and activities, contributing to the promotion of a healthy lifestyle	The square plays a role in fostering community well-being through physical fitness and recreational events.
Masoudieh Palace	Masoudieh Palace is a historical site, known for its architectural beauty and cultural significance	It has witnessed historical gatherings, cultural events, and has been a residence for important figures	As a historical landmark, Masoudieh Palace reflects the rich cultural heritage of Tehran and serves as a reminder of its royal past.
Tehran Bazaar	Tehran Bazaar is a bustling marketplace, comprising various sections specializing in different goods, from spices to textiles.	The bazaar has been a center for trade and commerce for centuries, adapting to changing economic landscapes.	Tehran Bazaar is not only an economic hub but also a cultural and social space, embodying the traditional Iranian market atmosphere.
Sardar e Baghe Meli	sardar e Baghe Meli is a public garden and recreational area with historical significance.	It has hosted cultural events, festivals, and serves as a green oasis in the midst of urban Tehran.	The garden provides a serene escape for residents and visitors, contributing to the city's green spaces and cultural activities.
Carpet Museum of Iran	The museum is dedicated to showcasing the art and history of Persian carpets and textiles.	It has hosted exhibitions highlighting the craftsmanship and cultural significance of Persian carpets	The Carpet Museum of Iran is a cultural treasure, preserving and promoting the rich tradition of Persian carpet weaving.
Saadabad Complex	Saadabad Complex is a historical palace complex that served as the residence for the royal family.	It has been witnessing to historical moments, political changes, and has now been transformed into a museum.	The complex is a symbol of Iran's monarchical history and is an important cultural and historical destination
Tochal Complex	Tochal Complex is a recreational area with a cable car leading to the Tochal mountain range, providing skiing and other outdoor activities.	It hosts winter sports events and has become a popular destination for outdoor enthusiasts.	The complex contributes to Tehran's recreational infrastructure and serves as a gateway to the natural beauty of the Tochal mountains.
Museum of Time	The Museum of Time is dedicated to the history and evolution of timekeeping devices.	Exhibits showcase ancient and modern timepieces, reflecting the cultural and technological changes in measuring time.	The museum offers a unique perspective on the cultural and scientific aspects of timekeeping, highlighting its importance in human history.

**Table 3** Descriptive statistics of the participants

	Age		Gender		Education			
	20–40	41–70	Male	Female	Diploma	Bachelor	Master	PhD
Questionnaire	134	66	107	93	8	73	97	22

**Table 4** Pearson correlation among preference, sense of place, feelings of peace, and place attachment

Preference	Sense of place		Peace	Attachment
	Pearson Correlation	0.493**	0.268**	0.405**
Sig. (2-tailed)	0.000	0.000	0.000	

recognized as effective parameters to choose urban places. Sense of place has a significant relation to Identity, Antiquity, feel of space, satisfaction, events, and culture. Identity and Satisfaction were recognized as the two most impressive factors in sense of place (Table 7).

Regarding the literature review, two factors of culture and emotion were identified as remembering factors of an urban place. As can be seen in Fig. 5, although

emotional parameters were significant to female participants, cultural parameters were noteworthy for male contributors. An interesting finding was that participants with master's degrees and diplomas preferred cultural mapping and people with bachelor or Ph.D. levels of education selected emotional mapping. Furthermore, participants with ages of 20–30 and 40–50 considered emotional mapping as an important factor to remember

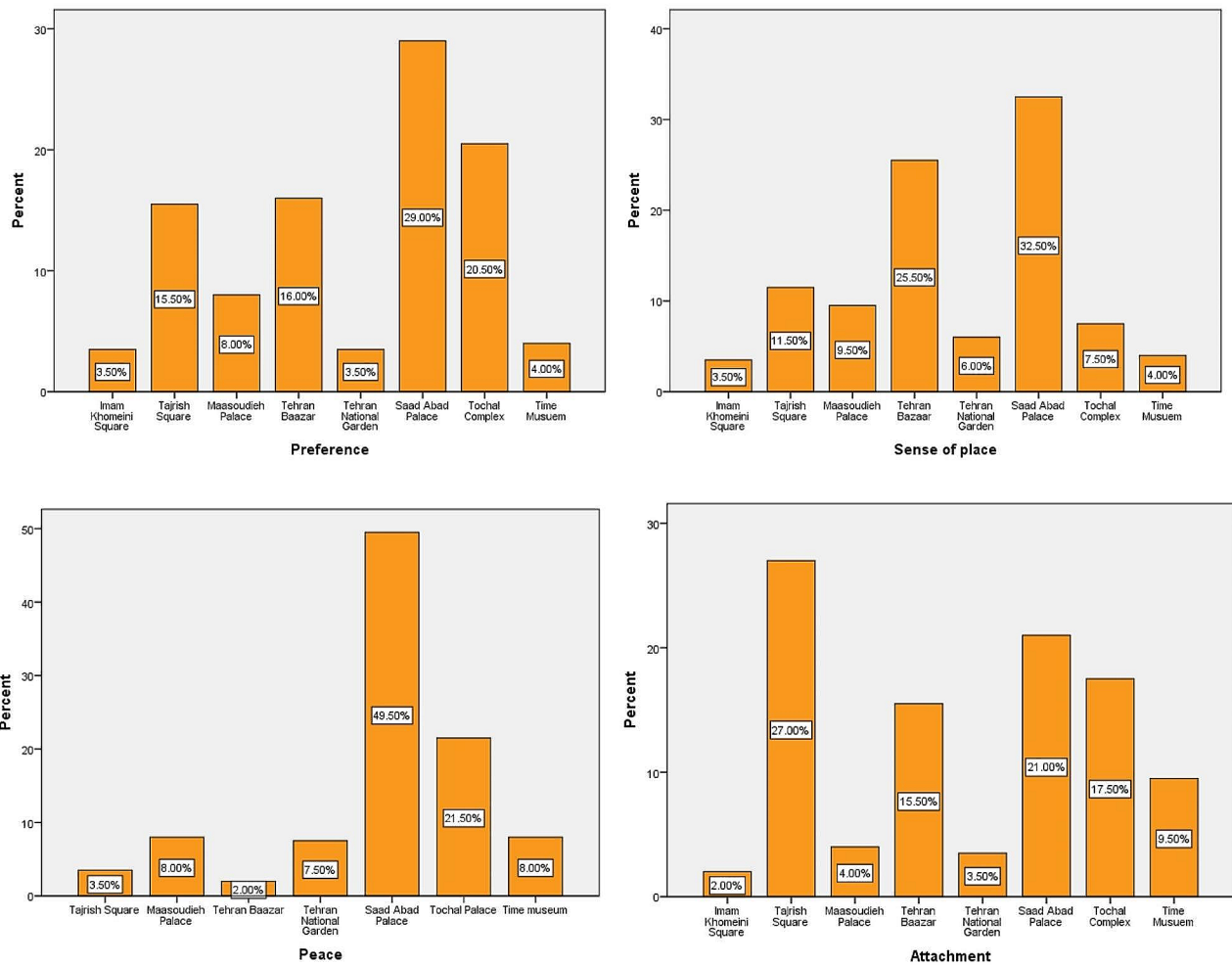


Fig. 3 Rank of places based on preference, sense of place, peace, and attachment

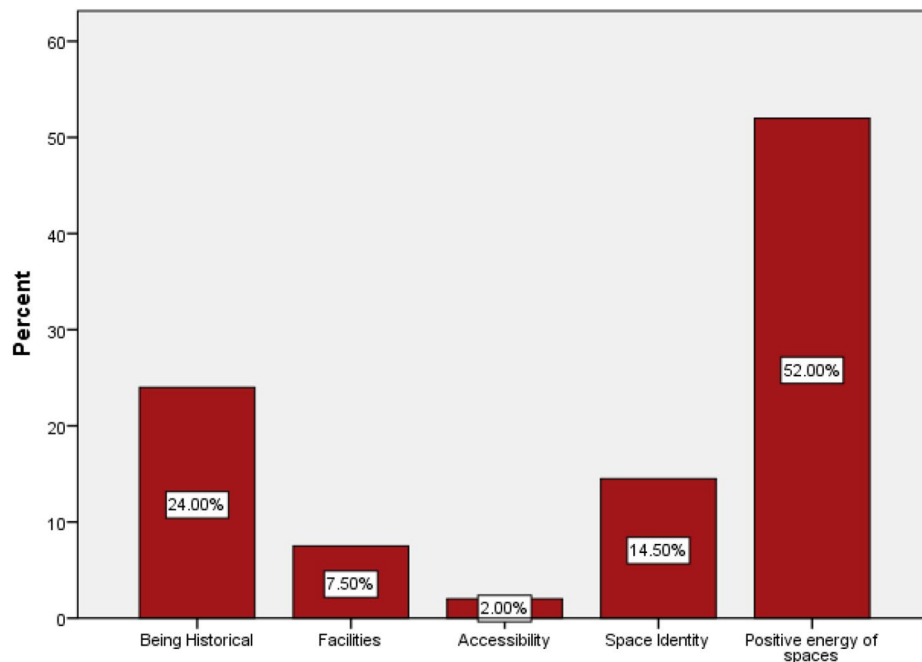
Table 5 Result of Emotional Parameters

Emotional Parameters
Proud, Fascinated, Excited, Curious, Thoughtful, Relaxed, Relaxed, Compassionate, Energetic, Pleased, Peace and Happy.

as opposed to people with ages of 30–40 and 50–60. Therefore, recognizing the Users can make difference in the design stage. These remarkable findings help designers to identify their user needs and perspective point of view to achieve more according to design.

Table 6 One-Sample T-test by considering imperative parameters

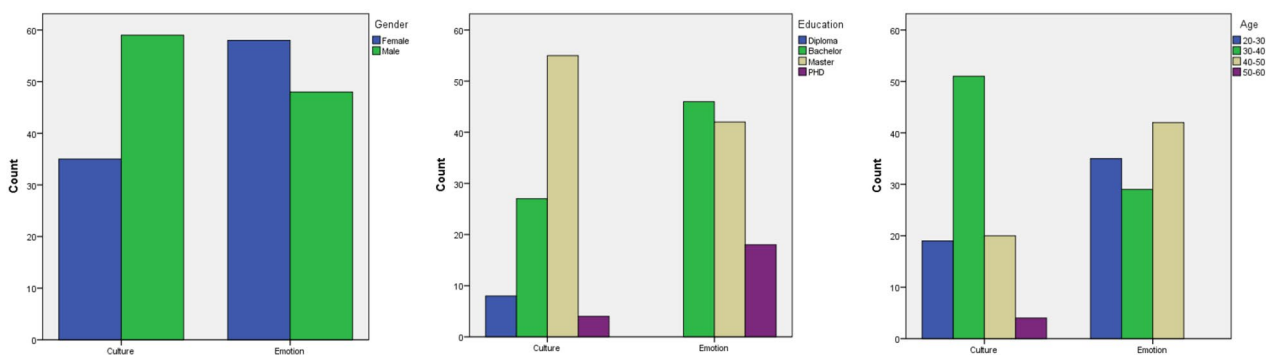
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Identity	55.414	199	0.000	4.93000	4.7546	5.1054
Antiquity	40.162	199	0.000	4.18500	3.9795	4.3905
Feel of peace	99.734	199	0.000	5.52000	5.4109	5.6291
Feel of happiness and thrill	82.484	199	0.000	5.32500	5.1977	5.4523
satisfaction	132.284	199	0.000	5.61000	5.5264	5.6936
Events	40.882	199	0.000	4.46000	4.2449	4.6751
Accessibility to malls	32.794	199	0.000	3.71500	3.4916	3.9384
Being Cultural	43.742	199	0.000	4.39500	4.1969	4.5931
Sense of Place	77.906	199	0.000	4.98500	4.8588	5.1112



**Fig. 4** effective parameters on choosing urban places

**Table 7** Pearson correlation among Sense of place and other parameters

		Identity	Antiquity	Feel of peace	Satisfaction	Events	culture
Sense of place	Pearson Correlation	0.577**	0.394**	0.359**	0.526**	0.386**	0.333**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000
	N	200	200	200	200	200	200



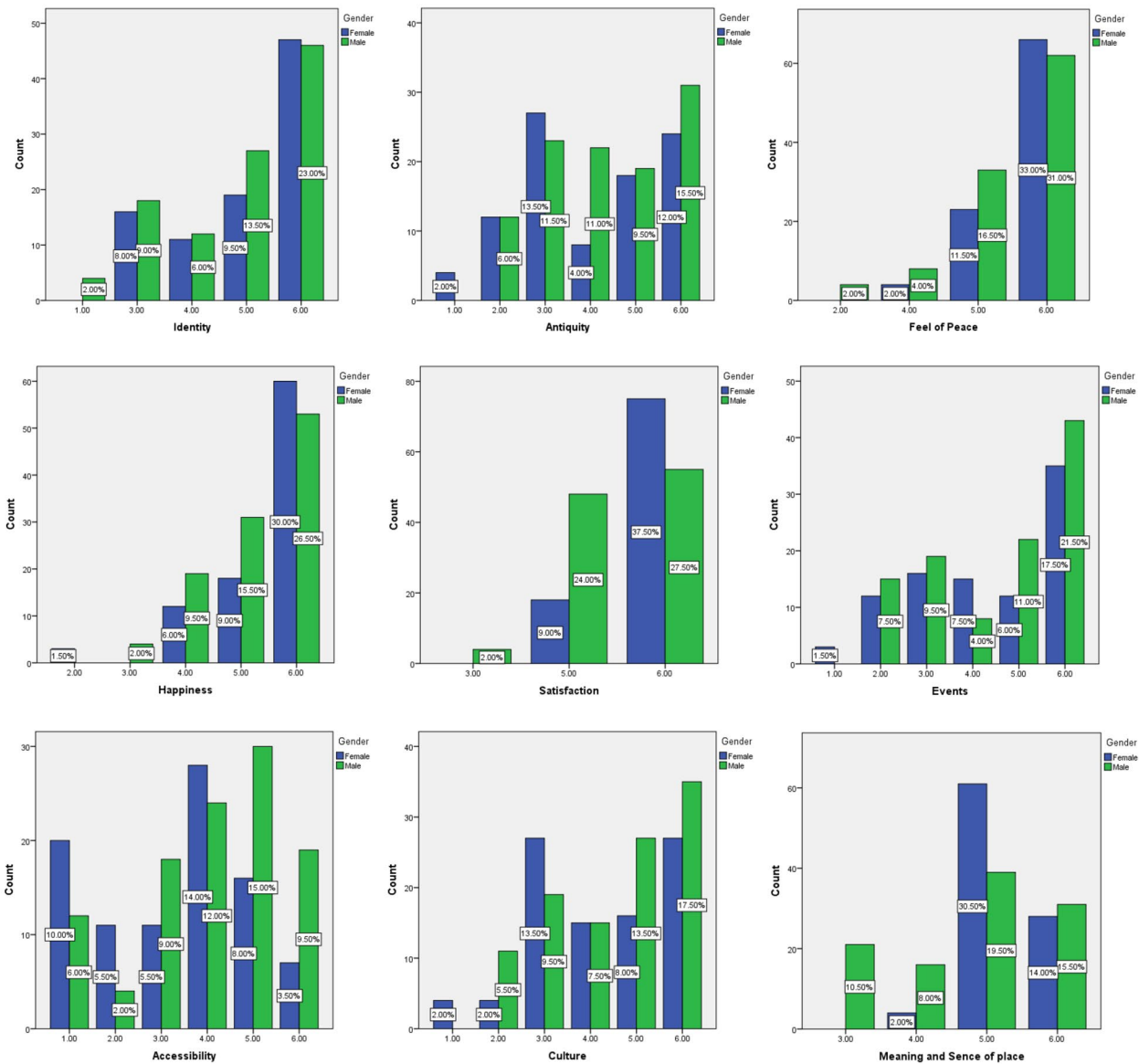
**Fig. 5** Effective parameters on collective memory

Regarding Fig. 6, studied parameters were evaluated by citizens' gender. Results indicated that identity, the feeling of peace, and happiness were effective parameters for both genders. Although participants showed similar ratings in satisfaction, meaning, and sense of place, the results showed significant differences between both genders. By conducting the ANOVA test, the mean of culture, accessibility, events, and Antiquity for the male gender was higher than the female participants. The

finding emphasized what should be considered in designing places to affect the collective memory of citizens. As shown in Fig. 7, male participants focused on the cultural aspect of places more than any factors.

Moreover, citizens with a diploma education scored higher in Identity, the feeling of peace, Happiness, Satisfaction, Events, Accessibility, and the sense of place (Fig. 8). Conversely, individuals with Ph.D. levels assigned a higher rank to Antiquity and culture as important





**Fig. 6** Evaluating the Parameters based on Gender

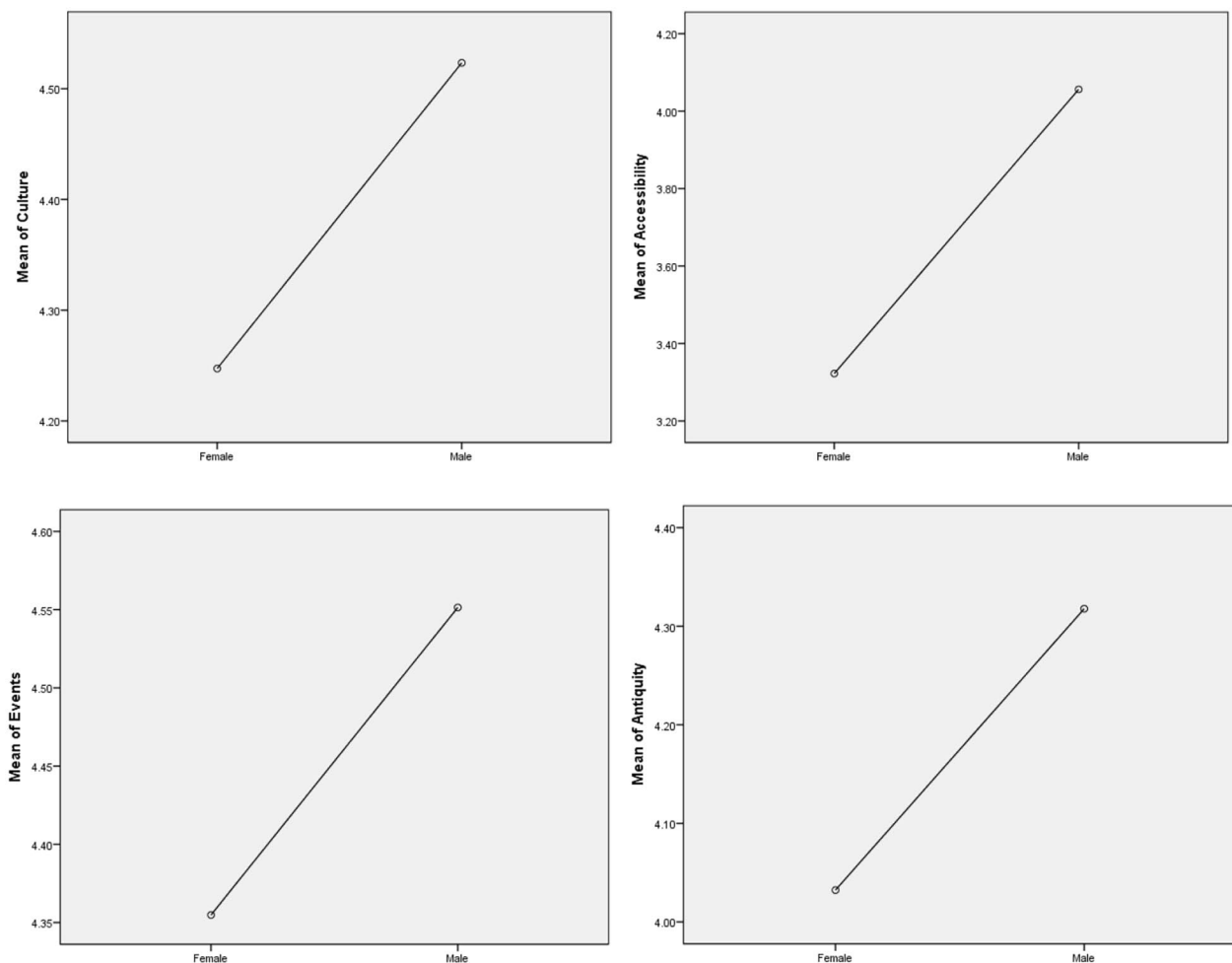
factors. As depicted in Fig. 8, the rating trends for accessibility, the sense of place, satisfaction, and holding events were similar. Additionally, the trend of ranking for peace and happiness was comparable and declined from diploma to Ph.D. education. The findings highlight that education plays a significant role as a variable for citizens, emphasizing the importance of its consideration by architects and designers.

**Discussion**

Regarding stated that collective memory is affected by events/ activities, history, and personal value. In addition to mentioned parameters, our results added identity, antiquity, feel of peace, feeling of happiness, satisfaction,

accessibility, facilities, place attachments, being cultural, and sense of place to effective parameters on collective memory. Figure 9 demonstrates the operative considerations on collective memory by deliberating emotional and cultural mapping.

As cultural mapping engaged with memorable places, accessibility, overcrowding by all social levels, and reminding cultural history are recognized in this research. The findings are also revealed that feelings and places' value are attached to cultural mapping which confirms the other researches such as (Xu et al. 2020) and (Inquiry et al. 2016). As (Cresswell 2014) stated that emotions to a place are recognized as important parameters,



**Fig. 7** Means plots based on gender

this research has been emphasized Excitement, Pride, pleasure, and nostalgia.

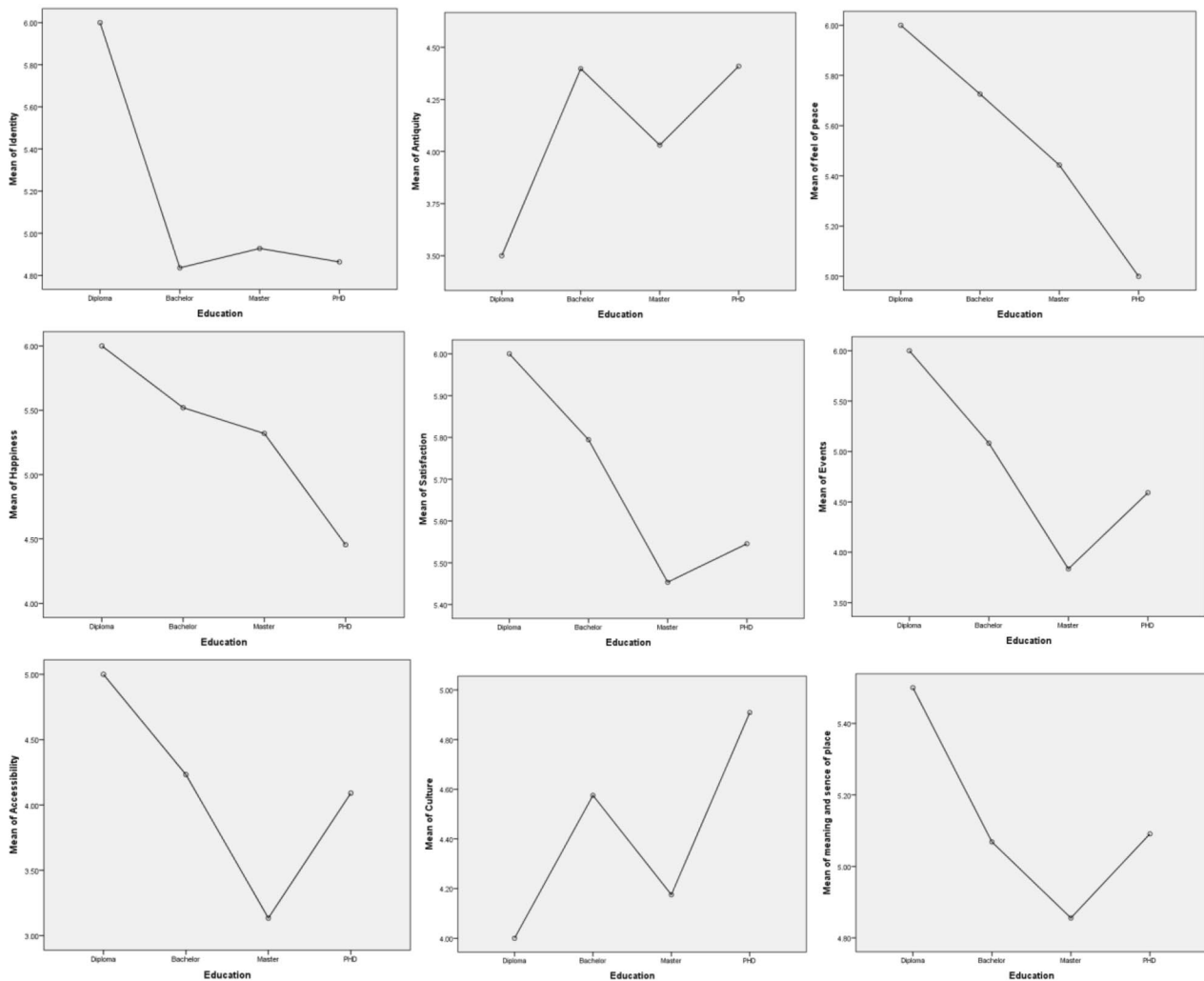
According to (Paül i Agustí et al. 2019), places as fields of care are related to emotions and experiences. Results were confirmed their result and also added that emotional mapping is attached to cultural mapping. (Korpela et al. 2002) stated that beautiful, boring, dangerous, or scary can be felt in memorable places. However, in this paper, Pride, sense of power, meditative depth, pleasure, excitement, nostalgia, peace, compassion, vitality, and happiness were acknowledged as significant emotions.

## Conclusion

This study investigated the collective outstanding spaces in cities and their association with urban emotion and culture. The objective of this study was to determine the relation of cultural and emotional mapping on collective memory and find effective factors on citizens' memory. The foremost gap in studied subjects was the lack of a combination of cultural and emotional mapping. Results

illustrated that user preference is more comprised of a Sense of Place and place attachment. Besides, Results indicated that Identity of place, Antiquity, a place with creating Feel of peace and happiness and thrill, user satisfaction, occurring events in the place, Accessibility to malls, Being Cultural and Sense of Place were all parameters relevant and important to participants. Furthermore, Results indicated that urban emotions corresponded to cultural emotions since the participants preferred places with deep roots in Iranian culture. Other main findings were revealed as follows:

- Emotional mapping is more important than cultural mapping for collective memory.
- Emotional parameters were significant to female participants as cultural factors were for male respondents.
- Level of education and age were two factors that affect cultural mapping or emotional mapping choices same as gender.

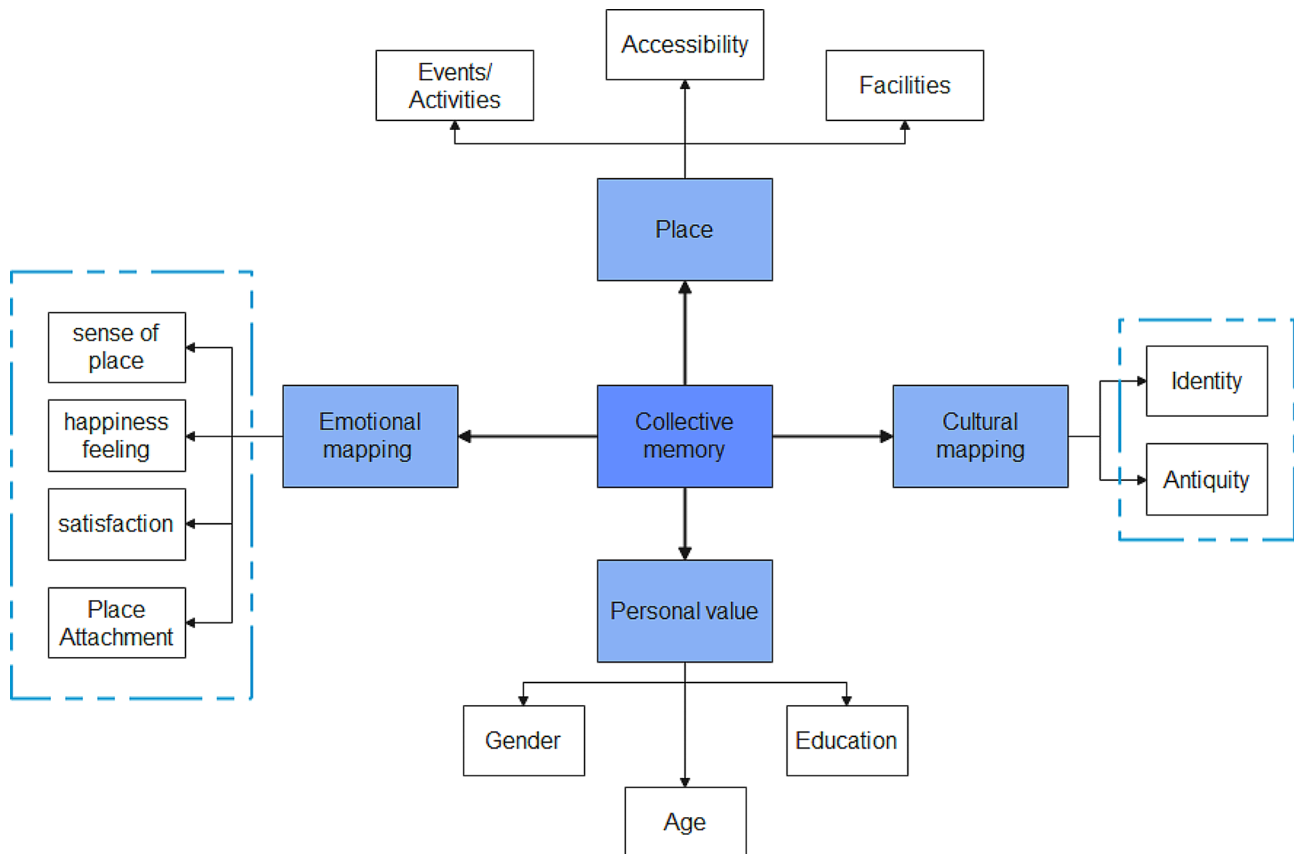


**Fig. 8** Means plot of parameters based on education

- Sense of place has a significant relation to Identity, Antiquity, feel of space, satisfaction, events, and culture.
- Identity and Satisfaction were recognized as the two most impressive factors in sense of place.
- Positive emotions of citizens influenced the collective memory of places they had been to.
- Having transportation, accessibility, the existence of bazaars and mall centers, and green places were the main factors in making places memorable and valuable.
- A place that provided facilities for people from all walks of life was a criterion for cultural mapping and collective memory.
- Cultural parameters were connected to the collective memory of the places.
- Pride, sense of power, meditative depth, pleasure, excitement, nostalgia, peace, compassion, vitality,

and happiness were important emotions in this study.

The findings emphasized the importance of engendering emotions for citizens in every urban space. Moreover, designing urban places based on the cultural status of each society had a significant role in stimulating the emotions and drawing the interest of the citizens. Besides, providing required facilities such as accessibility, business potentiality, and needed places around the edges of the design map was another essential argument. The future study should pursue extracting the mind map of citizens about these three places. Similar research about negative emotions and collective memory can be done as well.



**Fig. 9** effective parameters on collective memory

### Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s40410-024-00234-8>.

Supplementary Material 1

### Acknowledgements

We thank all participants for their assistance with the interviewing and questionnaire.

### Author contributions

The first and the second author contributed equally.

### Funding

Not applicable.

### Data availability

Not applicable.

### Declarations

### Competing interests

Not applicable.

Received: 18 September 2022 / Accepted: 31 May 2024

Published online: 08 June 2024

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