Research Paper

Factors Influencing Residents' Place Attachment: Case Study in Tehran

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Abstract
The study intends to explore the factors that lead to an increase in place attachment of apartments in residents' attitudes toward applying for housing. After analyzing previous research on connectivity, five major components that affect place attachment were identified: perceptual-cognitive, social, historic-cultural, physical, and economic factors. Field research involving 73 Tehran mid-rise apartment residents utilized textual-visual questionnaires to investigate these factors, employing open coding and content analysis for data interpretation. Despite subtle contextual changes, the findings support the relevance of the identified components. According to the participants, influencing factors listed as environmental, sociocultural, perceptual-cognitive, economic, and historic emphasize the relevance of the first five; however, the details, order, and synthesis differ somewhat from those in the research reviewed. Furthermore, based on the literature reviewed, the study concluded a three spatial scale named global-urban-property for the home connectivity scope, with varying strengths. Additionally, based on the field study conducted, the paper added two sub-scales to the property scale, specifically within the context of an apartment. These sub-scales are building and unit. City, community, and neighborhood are subscales of the urban scale. The global scale is also related to the country, which was not highlighted in the context of the present study since all participants were Iranian. Thus, the spatial scales of place attachment for apartments include city, community, neighborhood, building, and unit. Analyses highlight the relationship between a sense of belonging, influencing factors, and spatial scales. The study concludes that residents' place attachment is a protracted process that includes building/unit allocation and context-sensitive design considerations. In conclusion, changes in the sociocultural setting impact inhabitants' perceptions of place attachment.

Keywords: Place attachment, Residential environment, Apartment, Connectedness process, Sociocultural.

INTRODUCTION

Several synonymous terms define "place attachment" such as "connectedness" and "belongingness." According to Merriam-Webster's dictionary (2024), attachment in psychology is defined as a strong emotional bond that an infant forms with a caregiver (such as a mother), especially when viewed as a basis for normal emotional and social development; it is also considered a process for forming such bonds. For the word "connectedness," one of the entries addresses this meaning: having social, professional, or commercial relationships.

Belongingness is associated with possession and a close or intimate relationship.

In the 1960s and 1970s, the exploration of the mental and psychological impacts of place attachment gained prominence. Anant (1969) conceptualized belonging as personal engagement in a social system, anticipating positive associations with mental wellness. Economic variables, as suggested by Anant's research, were seen to influence the link between belonging and anxiety. Rapoport (1969) argued that people construct spatial understanding through cultural rules, with national culture providing a foundational framework. Tuan

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(1974) delved into the influence of culture, gender, biology, upbringing, education, employment, and the physical environment on environmental choices, emphasizing topophilia as a specific expression of human love for a location. Relph (1976) underscored the role of connection to a place in shaping experiences and contributing to the identity of individuals and communities. Tuan (1977) highlighted the importance of culture and time in attachment, describing belonging to a place as a function of time, with the place serving as a recollection of times past.

Steele (1981) identified key physical aspects shaping the sensation and perception of a place. Previously, Schulz (1976) supported this idea, emphasizing the contribution of environmental components to the unique qualities of locations and place attachment. Additionally, Steele (1981) suggested that a sense of belonging leads individuals to see themselves as part of a place, influencing their roles based on experiences. Riger and Lavrakas (1981) investigated sociodemographic influences, highlighting the significance of physical components termed physical rootedness. Stokols and Shumaker (1981) posited that individuals evaluate a location based on its responsiveness to functional, bodily, and psychological needs, shaping their sense of belonging to a place. Little (1987) noted that personalities shape how people engage with their surroundings, considering sensory hierarchies and prominent senses in determining unique interaction styles with places.

Shamai (1991) sought to elucidate the nuances of place attachment through a seven-level scale, encompassing factors like not having any sense of place, knowledge of location, belonging, attachment, identification, involvement, and sacrifice for a place. However, Shamai acknowledged the scale's context-specific relevance. Altman and Low (1992) studied attachment across different lifestyles, highlighting psychological, sociocultural, biological, and environmental factors. They emphasized the roles of gender, temporal aspects, history, economic ties, spiritual relationships, and narrative ties in attachment. Jordan (1996) examined German studies on spatial attachment, considering factors like personality, age, residential type, and historical experiences. Teo and Huang (1996) argued that active public and government engagement in public housing planning enhances project success and tenants' sense of belonging. Talen (1999) stressed the role of public spaces and diversified land use in fostering community connection, focusing on the physical variables that influence community attachment.

Hidalgo and Hernandez (2001) studied place attachment in Santa Cruz de Tenerife and revealed gender and age as influencing factors, with women exhibiting stronger attachments to houses, communities, and cities than men. Attachment increases with age, and the most crucial spatial range for individuals changes over time. In a comprehensive exploration of neighborhood dynamics, Brown et al. (2003) investigated the determinants of place attachment in a community experiencing ongoing deterioration, aiming to leverage residents' attachment for neighborhood regeneration. Factors examined include sociodemographic and psychological/physical aspects, revealing their impact on residents' sense of belonging. Simultaneously, Backlund and Williams (2003) highlighted how individuals assess environmental satisfaction based on spatial references formed through experience. Smaldone (2006) emphasized the role of place type and duration of association in attachment, suggesting a shift from physical to social and emotional components with prolonged interactions. Education (Livingston et al., 2008), personality, and individual traits (Desagis, 2006) are identified as key aspects influencing the feeling of place. Manzo and Perkins (2006) delved into the intricate connections between community attachment, engagement, and planning, underscoring the importance of recognizing and enhancing the social and emotional significance of places for individuals. People's optimal locations are consequently shaped by their personalities, past experiences, and sensory hierarchy (Augustin, 2009).

Scannell and Gifford (2010) defined the attachment model as effective communication between individuals and surroundings, resulting in a desired, comfortable, and secure residence. Najafi and Kamal (2012) emphasized positive emotional relationships and psychological well-being as integral components of place attachment. McBeath et al. (2018) highlighted the efficiency of a sense of belonging in fostering collaboration and harmony. Taima and Asami's (2018) model for estimating place attachment emphasized the impact of physical elements, age, duration of residency, family income, marital status, land ownership, household size, population, and road length per area on place attachment. Giardiello and Cuervo (2018) studied rural Australian communities and revealed that a lack of belonging contributes to youth migration to urban areas. Furthermore, length of residency and property ownership play a crucial role in shaping the sense of belonging (Livingston et al., 2008; Hashemnezhad et al., 2013).

Escalera-Reyes (2020) demonstrated the pivotal role of residents' belonging in sparking social mobilization in Pegalajar, Spain. Gokce and Chen (2020) defined seven indicators of place attachment in Ankara, such as place identity, place dependence, nature bonding, social bonding, sense of belonging, familiarity, and social interaction. Manzo and Devine-Wright (2021) stressed the importance of physical and geographical aspects as resources for supporting social and psychological needs. Shin and Yang (2022) affirmed that longer residence amplifies attachment and civic participation, with homeowners exhibiting a pronounced mediating role of place attachment due to stronger community ties and vested interests.

Ji et al. (2023) argued that friendships have a positive influence on place attachment, contrasting with the limited impacts of family ties. This is consistent with Luo et al. (2022), who indicated the reduced significance of familial bonds in urban settings. These insights underscore the intricate interplay of cultural, social, and individual factors in shaping place attachment. Motalebi et al. (2023) proposed a framework highlighting the direct impact of objective physical characteristics and the indirect influence of individual traits on place attachment. Son et al. (2023) studied the Korean housing sector and revealed significant influences of the residential environment on various dimensions of place attachment.

Lee et al. (2024) explored multiple dimensions of place attachment in Hong Kong and incorporated six socio-political variables into the three dimensions of the person-process-place (PPP) framework. They found that political inclination and identity were significantly associated with the sense of place, with native citizens and others showing higher levels of place attachment. Jayakody et al. (2024) studied the drivers and nature of place attachment, emphasizing the importance of surrounding natural settings, particularly protected areas and landscapes, and the recreational, aesthetic, and biological values of these places in their place attachment.

Iversen and Dugstad (2024) found that place attachment is spatially determined and helps explain spatial variations in pro-environmental preferences and distance decay in nonmarket values. They stated that place attachment may provide valuable information on the affected populations through their econometric model when evaluating land-use policies. Banwo and Beraud (2024) emphasized contextual factors in the place attachment nexus of environmental civic actions.

Nzimande and Morris-Kolawole (2024) argued that the social environment, stronger community connections, and higher trust among neighbors support social surroundings and increase residential connectedness, particularly in low-rise compared with high-rise housing. They stated that the size of the residential building matters when it comes to individuals feeling attached to their residential environment. Guo et al. (2024) focused on the social and economic environments at a rural household scale and addressed how environmental perceptions that vary with the means of human-place interaction affect place attachment levels, especially for outmigrants.

In summary, the literature underscores various factors shaping place attachment, encompassing perceptual-cognitive, social, historic-cultural, physical, and economic considerations (Table 1). To synthesize the insights from the literature, a conceptual model is proposed in Diagram 1.

This study focuses on the concept of "apartment" within the context of the studies reviewed. Chiara and Crosbie (1995) divided urban housing into two models: single-family and apartment. Apartments can also be divided into two main groups: buildings up to 8 floors and those more than 8 floors, called high-rises. Globally, several categories define apartments based on the number of floors, which are not consistent across regions. According to the statistics announced by the Iranian Statistics Centre in 2015, mid-rise apartments are considered to be between 4-6 floors. Considering the Iranian context, this research employed mid-rise apartments, which are independent in residential areas of the city and are not located in gated communities. Typically, their residents are not related to each other. Depending on the floor area, each floor can have from one to several units, and elevators are primarily used for vertical communication instead of stairs.

The novelty of this study lies in its focus on four dimensions: a connection to the Iranian (Tehran) context, emphasis on the apartment type, exploration of residents' perspectives, and attention to different scales of place attachment relevant to social sustainability.

Table 1. The literature review at a glance

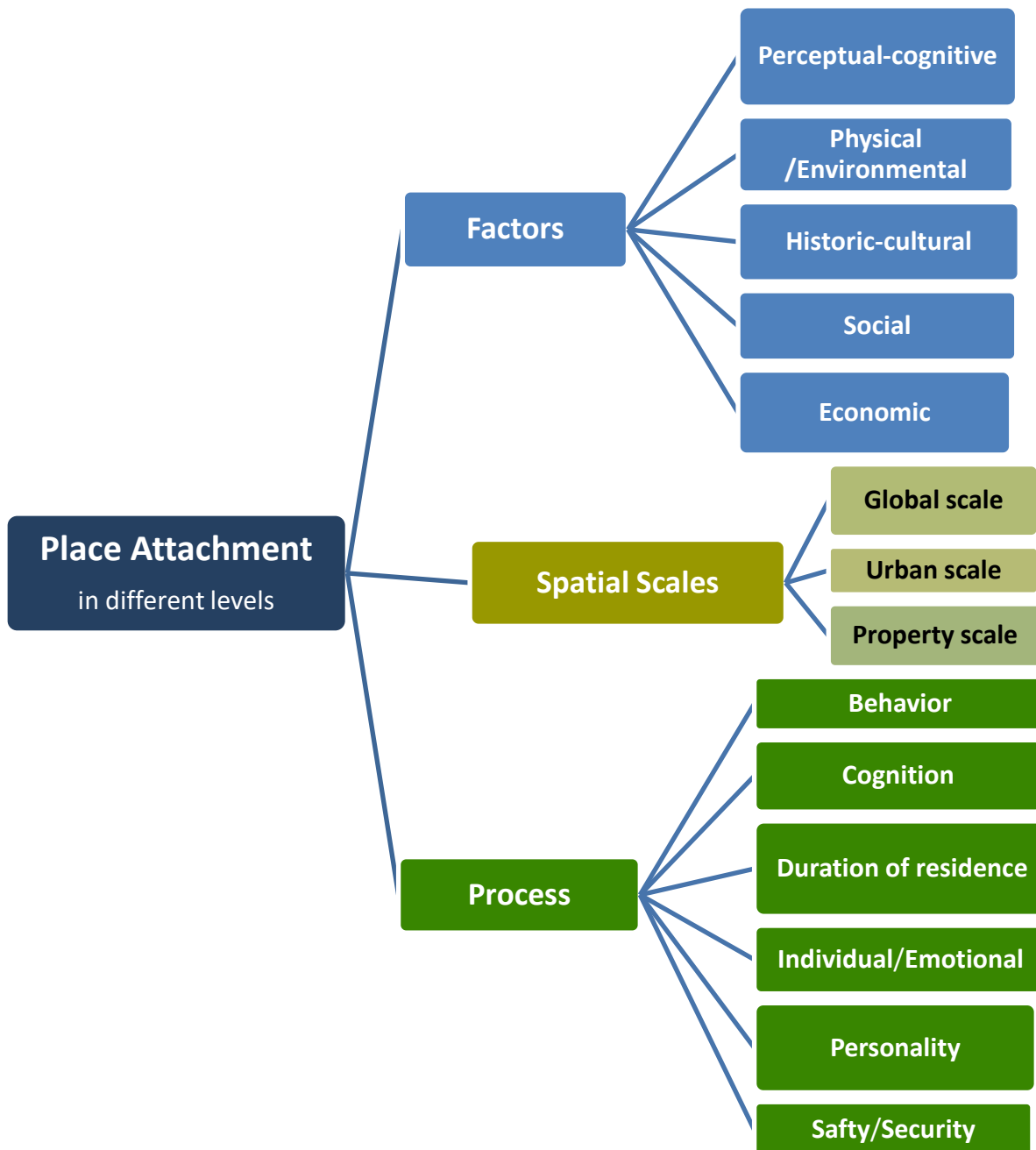|			
Place attachment factors	perceptual-cognitive		(Schulz, 1976; Shamai, 1991; Altman & Low, 1992; Backlund & Williams, 2003; Tuan, 1977; Nzimande & Morris-Kolawole, 2024; Guo et al., 2024)
	Physical /Environmental (natural /Built)		(Tuan, 1974; Schulz,1976; Steele, 1981; Riger & Lavrakas, 1981; Altman & Low, 1992; Talen, 1999; Backlund & Williams, 2003; Brown et al., 2003; Scannell & Gifford, 2010; Taima & Asami, 2018; Gokce & Chen, 2020; Manzo & Devine-Wright, 2021; Motalebi et al., 2023; Son et al., 2023)
	Historic-cultural		(Rapoport, 1969; Tuan, 1974; Tuan, 1977; Altman & Low, 1992; Jordan, 1996; Manzo & Perkins, 2006; Ji et al., 2023)
	Social/Human/Socio-political		(Anant, 1969; Riger & Lavrakas, 1981; Altman & Low, 1992; Smaldone, 2006; Manzo & Perkins, 2006; McBeath et al., 2018; Escalera-Reyes, 2020; Gokce & Chen, 2020; Manzo & Devine-Wright, 2021; Ji et al., 2023; Lee et al., 2024; Nzimande & Morris-Kolawole, 2024; Banwo & Beraud, 2024; Guo et al., 2024)
	Economic		(Anant, 1969; Riger & Lavrakas, 1981; Altman & Low, 1992; Brown et al., 2003; Livingston et al., 2008; Taima & Asami, 2018; Shin & Yang, 2022; Iversen & Dugstad, 2024)
Process components feature	Behavior/ Functions/ needs/ past experiences/ civic participation		(Altman & Low, 1992; Brown et al., 2003; Backlund & Williams, 2003; Escalera-Reyes, 2020; Shin &Yang, 2022; Banwo & Beraud, 2024)
	Cognition		(Stokols & Shumaker, 1981; Altman & Low, 1992; Brown et al., 2003; Backlund & Williams, 2003)
	Duration of residence		(Tuan, 1977; Tuan, 1977; Smaldone, 2006; Livingston et al., 2008; Hashemnezhad et al., 2013; Giardiello & Cuervo, 2018; Shin & Yang, 2022)
	Individual/ Emotional		(Tuan, 1974; Relph, 1976; Steele, 1981; Stokols & Shumaker, 1981; Shamai, 1991; Backlund & Williams, 2003; Desagis, 2006; Livingston et al. (2008), Najafi & Kamal, 2012; Ji et al., 2023; Motalebi et al., 2023)
	Age/Gender/Personality		(Tuan,1974; Altman & Low, 1992; Riger and Lavrakas, 1981; Little, 1987; Altman & Low, 1992; Jordan, 1996; Hidalgo & Hernandez, 2001; Taima & Asami, 2018; Augustin, 2009)
	Safety/ Security		(Altman & Low, 1992; Brown et al., 2003; Scannell & Gifford, 2010)
Spatial Scales	Global scale	Country	Lee et al., 2024
	Urban scale	City	(Altman & Low, 1992; Talen, 1999; Hidalgo & Hernandez, 2001; Brown et al., 2003; Manzo & Perkins (2006), Brown et al., 2003; Gokce & Chen, 2020; Nzimande & Morris-Kolawole, 2024)
		Community	
		Neighborhood	
	Property scale	Size	(Altman and Low, 1992; Jordan, 1996; Smaldone, 2006; Gokce & Chen, 2020; Nzimande & Morris-Kolawole, 2024)
		Residential type	
Levels	context-specific seven-level		
	Psychometric level		(Shamai, 1991; Jayakody et al., 2024; Guo et al., 2024)

Diagram 1. A conceptual model developed from the literature reviewed. (By authors)

METHODOLOGY

This research was conducted through a literature survey and a field study aimed at answering the question: What makes residents feel connected to their homes? The study focused on apartments in Tehran. From the literature review, a conceptual model was derived to prepare a mental map from the perspective of experts regarding the features and dimensions of the place attachment concept. Parallel to this step, the field study section was conducted by the authors.

The field study began with an initial questionnaire featuring open-ended questions to inquire about the components of the sense of belonging from the perspectives of apartment residents in Tehran. The questionnaire was piloted with 12 individuals from the community to gather feedback, which led to adjustments based on the responses. Some questions were edited, while others were removed or added. Consequently, a main questionnaire consisting of open and closed questions was developed, and information was collected from the statistical community.

Eighty-five participants were randomly selected from different areas of the city, all of whom lived in mid-rise apartment types. Team members were present in several neighborhood parks across Tehran

to identify interviewees. After getting to know some of the residents who lived in the apartments, a link to the questionnaire was sent to them via cell phone, resulting in 73 responses over two weeks. The participants' demographic information is shown in Table 2.

The closed questions at the beginning of the questionnaire collected information about the participants and their neighborhood dwelling, listed in Table 2. Additional closed questions at the end of the questionnaire were arranged on a Likert scale to measure the sense of belonging through several intervening factors that may be influenced by the demographic information of the participants. Open-ended questions were placed in the middle of the questionnaire and are shown in Table 3.

In addition, we arranged visual questionnaires (Figures 1–5) to utilize the participants' visual memory in identifying components that increase the sense of belonging. In designing these visual questionnaires, we included different types of examples corresponding to the factors and scales given in Diagram 1 to measure the participants' reactions and feedback. Open-ended questions allowed participants to address new aspects that were not directly questioned.

To select photos for the visual questionnaire, the authors searched several pictures across these categories: a) advertisements and websites for buying, selling, and renting contemporary apartments in Tehran with varying financial capacities, b) residential works published by architects in prestigious architecture magazines, c) visual documents of traditional residences in Tehran, and d) pictures with relevant content from our archives gathered by moving through and walking in the residential apartment areas of Tehran.

Table 2. Demographic information of the participants

Rows	Variables	Category	Number	Percent %
1	Gender	Female	39	53
		Male	34	47
2	Age	17-20	4	6
		21-44	41	56
		45-60	22	30
		>61	6	8
3	Marital Status	Married	41	56
		Single	32	44
4	Number of Children	No children	37	51
		Having children	36	49
5	Duration of Residence in the current dwelling	More than 5 years	19	26
		Between 3 to 4 years	33	45
		1 or 2 years	12	17
		Less than 1 year	9	12
6	Acquisition Status	The owner	43	59
		Tenant	30	41

Table 3. Open-ended Questionnaire

| rows	Questions
1	What are the factors of a residential place that you have belonged to the most?
2	a) Does your neighborhood have a special element or design that makes you feel belonging? b) What factors affect the residents' sense of belonging to the neighborhood? c) Does the presence of certain historical signs or symbols from previous periods in your neighborhood strengthen your belonging?
3	a) Is the green space of your apartment designed in such a way that you can be present in different seasons of the year? b) What about your neighborhood? c) For what activities? d) What times?
4	What are the factors that shape your sense of belonging to your residential unit?
5	a) How much do you interact with your neighbors? b) What kind of communication do you have with them?
6	How do you navigate the neighborhood?
7	What circumstances prevent you from belonging to your residential unit?
8	a) I believe myself to be emotionally bonded to this flat. b) I consider myself to be a resident of this community.
9	a) Do you want to swap your apartment unit for another? Why is this so? b) if yes, c) if no.
10	Which sections of your unit are you attached to?
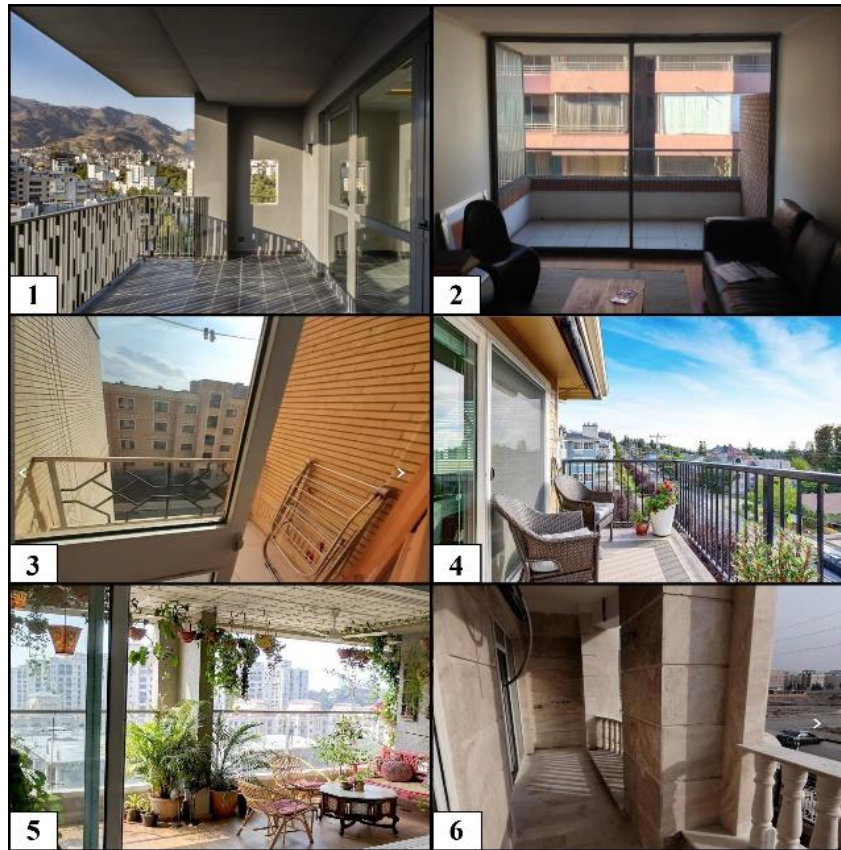
Fig 1. Visual questionnaires, related to semi-open spaces of apartments in apartment/unit scale

Fig 2. Visual questionnaires, related to interior spaces of apartments in unit/apartment scale

Fig 3. Visual questionnaires, related to sharing spaces of apartments on apartment/neighborhood scale

Fig 4. Visual questionnaires, related to urban scale

Fig 5. Visual questionnaires, related to unit scale

From this search, approximately 90 pictures were collected, of which 36 were selected to share with the participants. The criteria for selecting the photos included ensuring a variety of different parts and levels of the inside and outside of the apartments, such as units, buildings, community blocks, and the city, encompassing open spaces, semi-open spaces, closed spaces, green spaces, and other features. Figure 1-4 asked participants to sort pictures by the highest to lowest sense of belonging, while defining their criteria. At the end of the visual questionnaire in Figure 5, participants were asked to sort two pictures by the highest sense of belonging and two by the lowest sense of belonging, defining their criteria as well. Therefore, the research method used in the present study is qualitative, aimed at investigating factors that influence connectedness. The tactics used included visual-textual questionnaires and sorting photos during open coding and content analysis. Both tactics revealed similar user opinions, suggesting they effectively capture user preferences.

RESULTS

Based on the field study in the open-ended textual and visual questionnaire answers, the higher frequency codes mentioned by the participants were counted. Referring to Table 4, each question highlights the first five codes in order of their frequency, from highest to lowest.

According to Q1 (abbreviation of question 1), environmental or physical factors are a priority in the participants' viewpoints as these factors most

frequently affect their connectedness. Depending on whether people prefer living in an apartment or a house, their sense of belonging varies. This variation is influenced by the area of the residence. Having a private yard (open space), a view, efficient natural light, and the existence of green space are other determining factors. This result suggests that the qualities of respondents' living units have more impact on their home connectedness compared to larger scale characteristics such as the neighborhood and city.

Based on Q2, the study found that proximity to shopping zones, green spaces, parks, public transportation accessibility, and neighborhood history were key items in fostering community connection. Participants also considered the social and environmental context, recreational facilities, and quality of neighborhood paths. However, 90% of participants felt that historical signs in their neighborhood did not enhance their sense of belonging. Historical Tehran districts have a lower residential use prevalence compared to newer areas like District 22, which significantly affects respondents' responses. Further research is needed to understand the role of historical landmarks and elements in fostering place attachment.

According to Q3, the study reveals that 41% of participants find their apartment's green spaces unsuitable for all seasons, while 30% believe they can partially use them. Sixty-five percent of participants find their neighborhood's green spaces suitable for all seasons. Among these, 35% use them for exercise and running, while 18% use them for walking and spending time. Gathering with friends and sitting

alone also ranks high in usage, followed by children's playgrounds. Green spaces are most utilized in the evening, followed by mornings and nights. These results underscore the importance of private, semi-private, and public green spaces in meeting residents' needs and highlight deficiencies in suitable green spaces within respondents' neighborhoods and apartments. Moreover, the predominant use of green spaces in the evening emphasizes the need for ensuring safety and security in these environments during that time.

In Q4, residents' sense of belonging to their unit was influenced by variables such as having a view of trees from the window, engaging in personal activities, enjoying good views of the sky, cherishing good memories, finding relaxation, experiencing spaciousness, and having opportunities for family gatherings. These factors significantly contribute to a sense of belonging and satisfaction among residents. This finding underscores the importance of the relationship between the indoor and outdoor aspects of the unit, particularly how connection to nature, such as views of trees and the sky, influences place attachment. Additionally, the ability to engage in personal activities, relax, and gather with family members further enhances home connectedness at the unit scale.

According to Q5, 40% of participants never interact with their neighbors, while 32% do so seldomly, and 48% do not engage in any participatory activities. A significant portion (16%) only interacts for greetings, and surprisingly, 14% do not even know their neighbors. These results highlight a notable lack of social interaction and collective life on a neighborhood scale, which is a critical factor hindering the formation of a sense of belonging to the community.

Based on Q6, 48% of respondents navigate their community on foot, while 22% use cars. The fact that nearly half of the respondents favor walking in their neighborhood, and some even use bicycles, suggests that significant parts of the neighborhoods surrounding the apartments under study are pedestrian-friendly. This pedestrian accessibility provides residents with more opportunities to engage with their living environment, which can significantly contribute to their sense of belonging to the neighborhood.

According to Q7, the factors that decrease participants' sense of connectedness are ranked as follows: crowding and chaos, obsolescence of the unit, and delinquency in the neighborhood. These factors play significant roles in detracting from place attachment on both the unit and neighborhood scales.

In Q8, over 57% of participants strongly agree with their connection to their flat and neighborhood, while 17% disagree. However, In Q9 despite this strong connection, 62% express a desire to switch units for larger, better-equipped, or more modern ones, whereas 38% love their current unit and feel calm there. This indicates that while over half of the residents feel a sense of belonging to their flat and neighborhood, their attachment does not preclude them from seeking better amenities or more spacious accommodations.

In Q10, respondents identified various living space categories they are attached to, with 56% mentioning bedrooms, 34% living rooms, 27% kitchens, 20% terraces, and 19% windows. Interestingly, the bedroom emerges as the most commonly mentioned space individuals are attached to, possibly due to its potential for personal activities and solitude, highlighting a nuanced aspect of place attachment.

In closed questions designed on a Likert scale to assess participants' sense of belonging, demographic variables such as age, gender, length of residence in the unit, marital status, presence of children, and tenure status (owner or tenant) were used to segment responses. Table 5 presents the findings derived from this analysis. According to the A1-A2 chart, there was no significant difference in the sense of belonging between male and female participants at the unit scale. However, women exhibited a slightly greater sense of belonging at the apartment and community scales.

In the B1-B2 chart, tenants reported feeling more connected to their units compared to owners, while owners felt stronger attachment to their apartments. Interestingly, the sense of belonging to the community was nearly identical for both owners and renters.

The C1-C4 charts showed that the sense of belonging to the apartment peaked among participants aged above 61 years. In contrast, the highest sense of community belonging was found among those aged 45-60 years.

According to the D1-D2 charts, married individuals had a stronger sense of belonging across all three scales (unit, apartment, community) compared to singles.

In the E1-E2 charts, having children was associated with higher levels of belonging across all scales, reflecting similar outcomes in both charts.

The F1-F4 charts indicated that an increase in the length of residency generally correlated with higher levels of belonging at the unit scale, except for those residing for 3-4 years. The apartment scale showed fluctuations without a clear trend, while at the community level, there was a slight decline in sense of belonging with longer residency, especially among those aged over 61 years.

Table 4. Responses to open-ended questions (The numbers on the horizontal axis of the graphs indicate the number of respondents to each issue.)

Rows	Quotes
Q1	Security — 2; Family presence — 2; people culture in the neighborhood — 2; Access to shopping zones — 2; Terrace and semi-open space — 2; Accessability — 3; Number of floors — 3; The privacy of the neighborhood — 3; Newly made — 3; Welfare amenities — 4; familiarity with neighbors — 4; Feeling relaxed — 5; Efficient natural light — 7; Possession — 8; Green space — 8; Having a perivate yard — 8; View — 8; Area — 10; Being a house or apartment — 13
Q2 a)	Famous neighborhood — 2; Cultural and social context — 2; Security — 2; Sloping ground — 3; historicl backgroundof the neighborhood — 4; Public transport — 4; Park — 8; Green space and trees — 8; Proximity to shopping zone — 11
Q2 b)	Being away from traffic — 2; Climate — 2; Have a slope — 2; Access and public transport — 2; Park — 2; Neighborhood green space — 5; Paths within the neighborhood — 17; Neighborhood cultural spaces — 18; Recreational-commercial spaces of the neighborhood — 23; Buildings around my apartment — 24; The social context of the people — 25
Q2 c)	Yes — 7; No — 66
Q3 a)	Yes — 21; Partly — 22; No — 30
Q3 b)	Yes — 11; Partly — 15; No — 47
Q3 c)	Fruit picking — 2; Afternoon tea — 2; Good neighborhood green space — 3; to use our good yard as events — 4; Using park — 6; Party — 7; For children to play — 7; sitting alone — 9; Gathering friends — 9; Walking and spending time — 13; Exercise and running — 26
Q3 d)	Spring — 2; All seasons — 2; Summer — 4; When the weather is nice — 2; everyday — 3; holidays — 4; Late night — 2; Morning — 5; Night — 5; Evening — 13
Q4	Archaism of the unit — 2; Taking care of pets — 6; Possibility of interfering and changing the unit — 13; Observing the vibrancy and activity of people — 14; Duration of residency — 16; affordability of Staying at home for a long... — 23; Satisfying façade of the apartment — 23; Changing the furniture — 24; Taking care of flowers and plants — 26; Having Privacy — 28; Newness of the unit — 29; Family presence — 29; Useable terrace — 33; Possibility of Family gathering in the unit — 36; The spaciousness of the unit — 37; Feeling relaxed — 37; Having good memories — 37; Seeing the sky from the window — 37; Having good view — 38; Doing personal stuff at home — 42; Seeing trees from the window — 44

Rows	Quotes
Q5 a)	Almost always — 3; Often — 4; Sometimes — 13; Seldom — 24; Never — 29
Q5 b)	Mourning — 2; Building committee meetings — 2; We are Relatives — 2; Helping each other — 3; We are close to each other — 3; Birthday parties, social gatherings — 4; I don't know my neighbors — 10; only for Greetings — 12; We do not have participatory activities — 35
Q6	Taxi — 4; Bike — 6; slope is steep and unsuitable for cycling and walking — 7; My car — 16; on foot — 35
Q7	Obligation to use artificial light — 2; Dark colors in interior design — 3; I don't like old houses — 3; Having bad memories in house — 4; Crowded interior — 4; Undesirable interior decoration — 4; I don't like luxurious houses — 4; I don't like it too much Simplicity — 5; Insufficient natural light — 5; Delinquency in the neighborhood — 7; Obsolescence of the unit — 7; Crowd and chaos — 12
Q8 a)	Neutral — 9; Strongly disagree — 10; Disagree — 12; Strongly agree — 19; Moderately agree — 23
Q8 b)	Neutral — 7; Strongly disagree — 8; Moderately disagree — 15; Moderately agree — 20; Strongly agree — 23
Q9 a)	No — 28; Yes — 45
Q9 b)	to have a house with a yard — 2; to more peace — 2; to better location — 3; Because I am tenant — 3; For a quiet neighborhood — 4; For better natural light — 4; For a better view — 4; I like diversity — 6; to have a modern unit — 6; Better facilities — 7; to have a bigger unit — 13
Q9 c)	Good view — 2; My unit is big — 2; I got used to it — 4; I feel calm here — 4; I love my unit — 5
Q10	Workspace — 4; Bathroom — 5; Window — 14; Terrace — 15; Kitchen — 20; Living room — 25; Bedroom — 41

Table 5. The results of the quotes about the sense of belonging through Likert scale for different variables like gender, age, and etc.

In Table 6, Chart A illustrated that individuals over 61 years old reported the highest sense of belonging to their units. Chart B highlighted that compared to women, men exhibited higher levels of attachment to their units. Additionally, individuals aged 45-60 years reported a stronger sense of belonging compared to other age groups. Married individuals, those with children, and tenants also expressed higher levels of desire to change units compared to singles, those without children, and owners, respectively.

According to Table 7, Figure 1 revealed that approximately 50% of participants chose picture No. 5 as their top choice, followed closely by about 45% selecting picture No. 1. The primary criteria influencing these choices were the spaciousness of the terrace, a good view, the presence of flowers and plants, panoramic views, and the ability to see trees and the sky. This suggests that a spacious and usable terrace, serving as a small outdoor and green space attached to apartment units, is highly valued and enhances residents' connection to nature.

Figure 2 showed that 39% of participants preferred picture No. 6, while 26% chose No. 1. The most important criteria influencing these selections were natural light, the view, spaciousness, spatial qualities, and an interest in traditional houses. Picture No. 1 and No. 6 depict two types of windows seen in Iranian traditional houses, which older respondents may have experienced during their childhood and youth. Although these types of windows are less common in modern Tehran apartments, their spatial qualities contribute to the attachment to housing.

Table 6. a) The sense of belonging to the residential unit of the participants, and b) Intention to exchange the unit
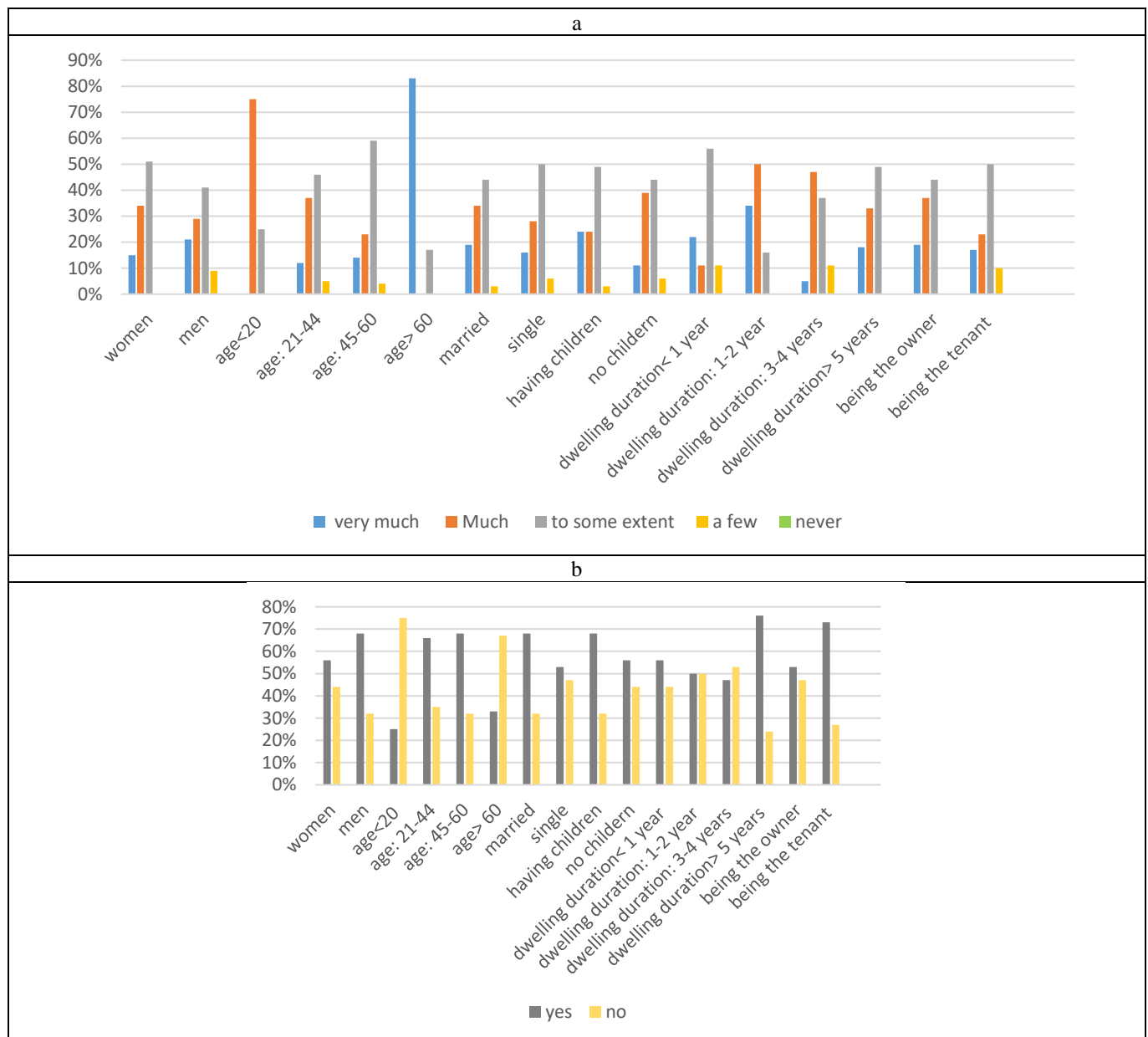
In Figure 3, 66% of participants selected picture No. 1 as their preferred option, followed by 35% choosing picture No. 3. The criteria for these choices included natural light in the staircase, green spaces in the surroundings, and the spaciousness of parking areas.

Figure 4 indicated that 55% of participants chose picture No. 1, while 32% selected No. 4. Picture No. 3 was also closely selected by 31% of participants. This outcome underscores the significance of green spaces and neighborhood amenities in fostering a sense of belonging among residents.

According to Table 8, Picture No. 10 received 47% of the votes indicating the least feeling of belonging, followed by Picture No. 2 with 32% of the votes in the same category. Conversely, Picture No. 3 garnered 47% of the votes as having the second highest feelings of belonging, with Picture No. 11 closely behind at 32%. Participants identified three primary reasons for the lack of attachment in these images: crowd and chaos, the oldness of houses, and delinquency in the neighborhood. Conversely, participants highlighted five key factors that increase feelings of connectedness: simplicity in design, interior decoration, luxuriousness, efficient natural light, and a sense of calmness.

DISCUSSION

The paper aimed to explore factors influencing residents' sense of belonging in apartments in Tehran, utilizing a conceptual model derived from scholarly literature and validated through field study data from textual-visual questionnaires. Several key findings and discussions emerge from the analysis, detailed below based on the tables provided:

Residents' place attachment factors primarily fall under physical or environmental categories, identified as the most influential aspects affecting attachment to their residences. Participants highlighted the importance of having private open spaces, especially yards, good views, sufficient natural light, access to green spaces, visibility of the sky, and spaciousness within their units. These environmental variables were consistently cited as crucial for fostering a sense of attachment. The emphasis on connecting with nature through these elements aligns with findings from Hur et al. (2010), who similarly identified the positive impact of vegetation, open spaces, and lower building density on satisfaction and place attachment.

Interestingly, 18% of participants noted that dwelling in houses versus apartments significantly influences their sense of attachment. This perspective underscores the distinction between housing types,

echoing findings by Gokce & Chen (2020), who discussed how the type of housing can indeed shape place attachment dynamics.

In addition, this finding aligns with the results of Lu et al. (2022), which suggest that residents with different migration patterns and diverse housing experiences exhibit varying degrees of place attachment. Second, socioeconomic factors play a pivotal role at the neighborhood scale. Proximity to recreational and commercial facilities within the community, as well as the quality of pedestrian paths especially in the evening, emerged as significant sub-factors positively correlated with increased sense of belonging among participants. Moreover, tenure status emerged as an important economic sub-factor influencing attachment, with half of the participants who were tenants acknowledging its impact (Table 4, Q1). This study's findings on ownership echo those of Molana and Adams (2019), Shin and Yang (2022), and Anton and Lawrence (2014).

Perceptual-cognitive aspects rank fourth in importance. For instance, the presence of slopes in certain areas of Tehran provides panoramic views from apartment windows or during neighborhood walks, enhancing a sense of connection to the landscape. Similar to findings by Hur et al. (2010), open views and spatial openness were highlighted as critical factors in place attachment. However, the hilly terrain may pose challenges for residents who enjoy cycling. Nevertheless, the topography of the city and its neighborhoods stands out as a factor influencing residents' sense of belonging. Interestingly, historical landmarks received little mention among participants regarding their sense of attachment to their apartments. This could be attributed to Tehran's relatively recent urban development compared to older Iranian cities, resulting in fewer visible historical elements. Additionally, the influx of immigrants to Tehran may limit historical ties, compounded by the construction of new residential areas lacking historical character.

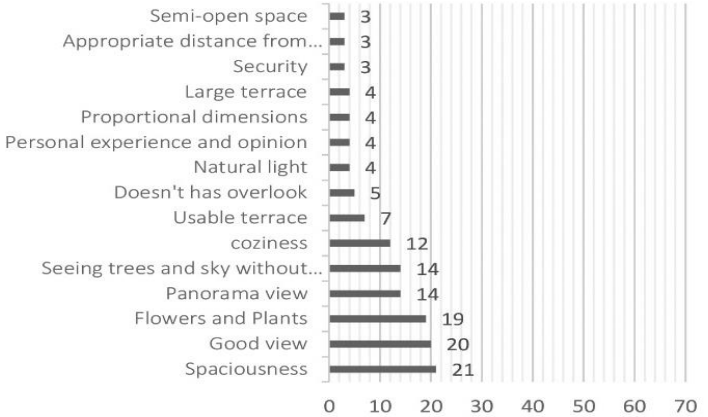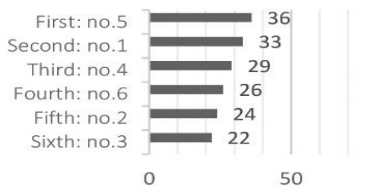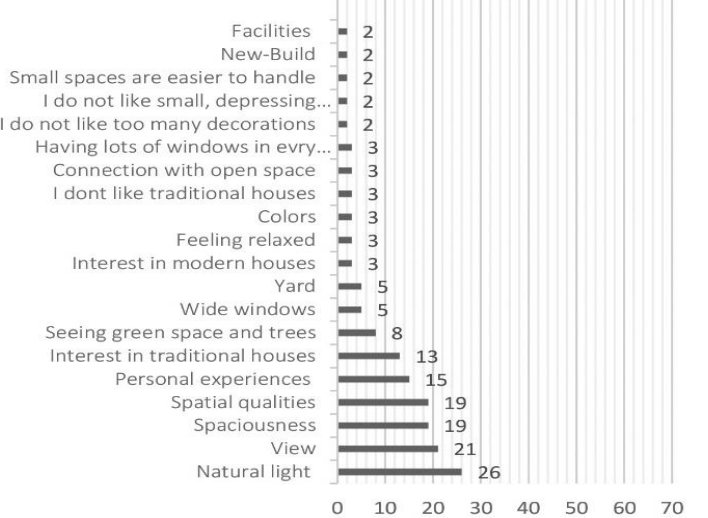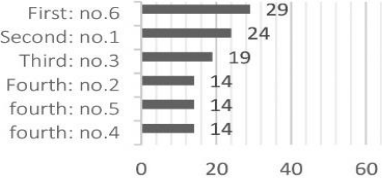**Table 7.** The results of the visual questionnaire (Figure 1-4)
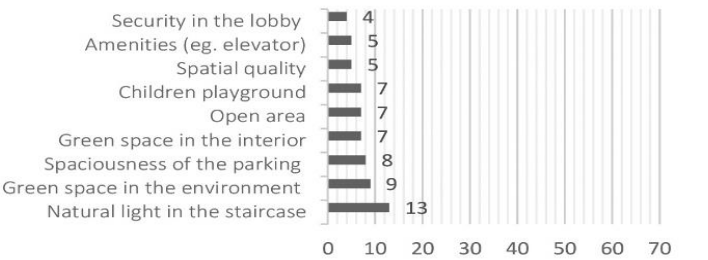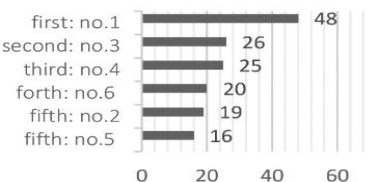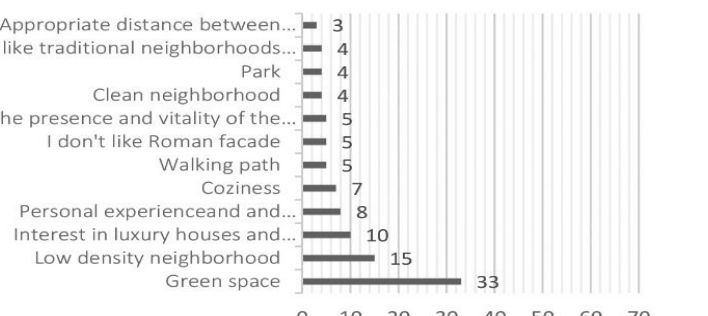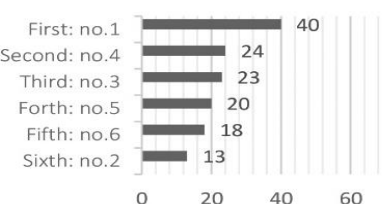
	Criteria for sorting photos	Priorities graphs
1	Semi-open space: 3; Appropriate distance from…: 3; Security: 3; Large terrace: 4; Proportional dimensions: 4; Personal experience and opinion: 4; Natural light: 4; Doesn't has overlook: 5; Usable terrace: 7; coziness: 12; Seeing trees and sky without…: 14; Panorama view: 14; Flowers and Plants: 19; Good view: 20; Spaciousness: 21	First: no.5: 36; Second: no.1: 33; Third: no.4: 29; Fourth: no.6: 26; Fifth: no.2: 24; Sixth: no.3: 22
2	Facilities: 2; New-Build: 2; Small spaces are easier to handle: 2; I do not like small, depressing…: 2; I do not like too many decorations: 2; Having lots of windows in evry…: 3; Connection with open space: 3; I dont like traditional houses: 3; Colors: 3; Feeling relaxed: 3; Interest in modern houses: 3; Yard: 5; Wide windows: 5; Seeing green space and trees: 8; Interest in traditional houses: 13; Personal experiences: 15; Spatial qualities: 19; Spaciousness: 19; View: 21; Natural light: 26	First: no.6: 29; Second: no.1: 24; Third: no.3: 19; Fourth: no.2: 14; fourth: no.5: 14; fourth: no.4: 14
3	Security in the lobby: 4; Amenities (eg. elevator): 5; Spatial quality: 5; Children playground: 7; Open area: 7; Green space in the interior: 7; Spaciousness of the parking: 8; Green space in the environment: 9; Natural light in the staircase: 13	first: no.1: 48; second: no.3: 26; third: no.4: 25; forth: no.6: 20; fifth: no.2: 19; fifth: no.5: 16
4	Appropriate distance between…: 3; I like traditional neighborhoods…: 4; Park: 4; Clean neighborhood: 4; The presence and vitality of the…: 5; I don't like Roman facade: 5; Walking path: 5; Coziness: 7; Personal experienceand and…: 8; Interest in luxury houses and…: 10; Low density neighborhood: 15; Green space: 33	First: no.1: 40; Second: no.4: 24; Third: no.3: 23; Forth: no.5: 20; Fifth: no.6: 18; Sixth: no.2: 13

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Table 8. The results of the quotes about Figure 5

Two pictures with the least feeling of belonging.	Two pictures with the most feeling of belonging.
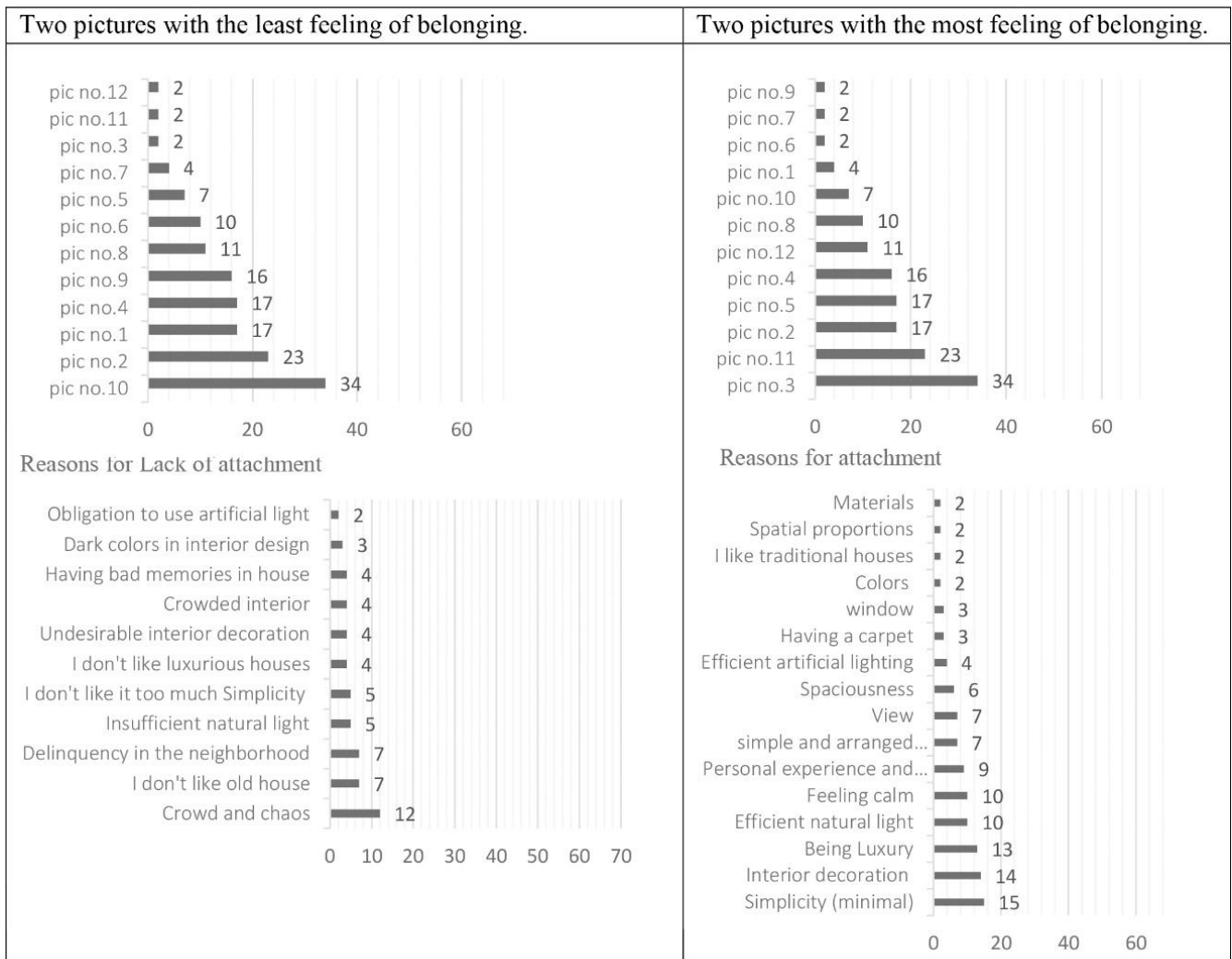
Another noteworthy finding is the nuanced sensitivity of place attachment across different scales observed in this case study. As evidenced by the result charts, particularly Table 4-Q1, participants expressed varying degrees of attachment across different dimensions, emphasizing the neighborhood scale while also distinguishing between the apartment and unit scales. Implicitly, the city scale was also referenced as a default comparison. This finding aligns with the framework proposed by Hidalgo & Hernandez (2001), which delineates three levels of attachment: house, neighborhood, and city, although some extensions beyond these scales were evident. The distinction between "house" and "apartment" is particularly pertinent in the Iranian context, where a house typically denotes a single-family dwelling connected to its neighborhood unit, whereas apartments are multi-unit buildings where residents often have less direct interaction. Apartments connect to the neighborhood unit through the building scale, introducing a hierarchical layer between the unit and

neighborhood scales. Thus, rather than a single house scale, this study identifies two distinct scales within apartments: unit scale and building scale. This observation resonates with Lewicka's (2010) framework, which recognizes five spatial scales of place attachment: apartment, building, neighborhood, city district, and city. In our context, the scales of "unit" and "building" correspond closely to the apartment and building scales identified in the study.

The attachment of Tehran apartments to their overall environmental design has been previously studied by Kamalipour et al. (2012), who focused on two scales of dwelling: neighborhood and city. They found that the neighborhood scale played a predominant role in shaping participants' sense of place attachment. Conversely, Saadati (2019) highlighted the significance of outdoor environmental features in fostering place attachment. Saadati's findings underscore that deficiencies in any scale can negatively impact residents' overall sense of belonging and connectedness to their living environment.

In contrast, Aksel & Imamoglu (2020) argued that the location of a neighborhood does not significantly influence levels of place attachment. They suggest that place attachment is primarily an affective-cognitive process shaped more by emotional ties, memories, and personal experiences than by physical attributes like neighborhood location or proximity to urban centers.

A third significant finding is the developmental process of place attachment across five interconnected scales, each influencing residents' sense of belonging. Individuals may develop varying degrees of attachment across these scales, with some feeling strongly attached in one scale while others across multiple scales. Participants in this study emphasized emotional and cognitive processes as crucial factors influencing their attachment. Emotional processes were often linked to family presence and spaces for gatherings, consistent with findings by Lewicka (2010) regarding family size as a socio-demographic factor influencing attachment. Cognitive processes were evident in participants' routines and interactions within their units and neighborhoods, indicating a cognitive dimension to their attachment. Eskandari et al. (2019), in their study on Tabriz apartment residents, similarly highlighted the impact of emotional indicators such as positive feelings about place, interest in staying, and pride, which contribute significantly to residents' sense of belonging. These findings align with Tester et al. (2011), who also identified positive neighborhood features as pivotal emotional processes contributing to place attachment on a neighborhood scale.

Another crucial parameter influencing the process of place attachment is functionality, a newer consideration from residents' perspectives. This factor relates to the adaptability of living spaces and units to contemporary lifestyles, which enhances residents' suitability and satisfaction with their living environments. Functionality thus plays a pivotal role in fostering a sense of belonging. Safety and security emerged as another significant parameter highlighted by participants across various scales—unit, apartment, and neighborhood—as essential factors contributing to their attachment.

Key findings are summarized in Diagram 2. Comparing Diagrams 1 and 2, regarding factors, the study confirms five aspects noted by scholars in case studies, but their prioritization, details, and interrelationships differ from those identified in the literature review. Regarding scales, Diagram 1 outlines three scales: global (country), urban (city, community, neighborhood), and property (house). In contrast, Diagram 2, focusing on Iranian participants, omits the global scale. Both diagrams maintain the urban scale, but Diagram 2 expands the property scale

from house to include apartment, further subdivided into building and unit. Regarding processes, all items in both diagrams align, emphasizing the emotional, cognitive, and functional dimensions that shape place attachment.

Based on the research findings compared to past studies, several insights have emerged. Unlike Hidalgo and Hernandez (2001), this study found no significant difference in the sense of belonging between men and women in their apartments. While ownership can enhance attachment to a specific unit, the study highlights that merely living in a unit contributes more to a sense of belonging than ownership alone. Interestingly, both renters and owners place high value on the surrounding community for fostering a sense of belonging at the community scale.

Regarding age, the study suggests that residents tend to feel a growing sense of attachment to their apartments as they age. Married couples and residents with children reported stronger feelings of belonging across all scales—global, urban, and property—compared to single residents, indicating that family or companionship strengthens attachment.

However, despite these stronger feelings of belonging among married couples and residents with children, a notable finding is that many still expressed a desire to move to more suitable dwellings. This suggests that factors such as apartment features and space requirements also play significant roles in relocation decisions, alongside feelings of attachment.

The research delves into inconclusive findings regarding the length of residency and its impact on the sense of belonging, offering nuanced insights:

Exception in the 3-4 Year Group: A notable observation is that a significant portion (40%) of residents in the 3–4-year residency group reported a lukewarm response ("not really") on the belonging scale across all three categories (global, urban, and property scales). This suggests that the duration of stay alone might not be the sole determinant of place attachment. Rather, intentions to move or other transitional factors could crucially influence their sense of belonging during this period.

Comparison with Other Groups: Interestingly, residents with shorter stays—less than a year or 1-2 years—exhibited similar belonging scores, ranking second highest. This implies that developing a connection to an apartment can happen relatively quickly.
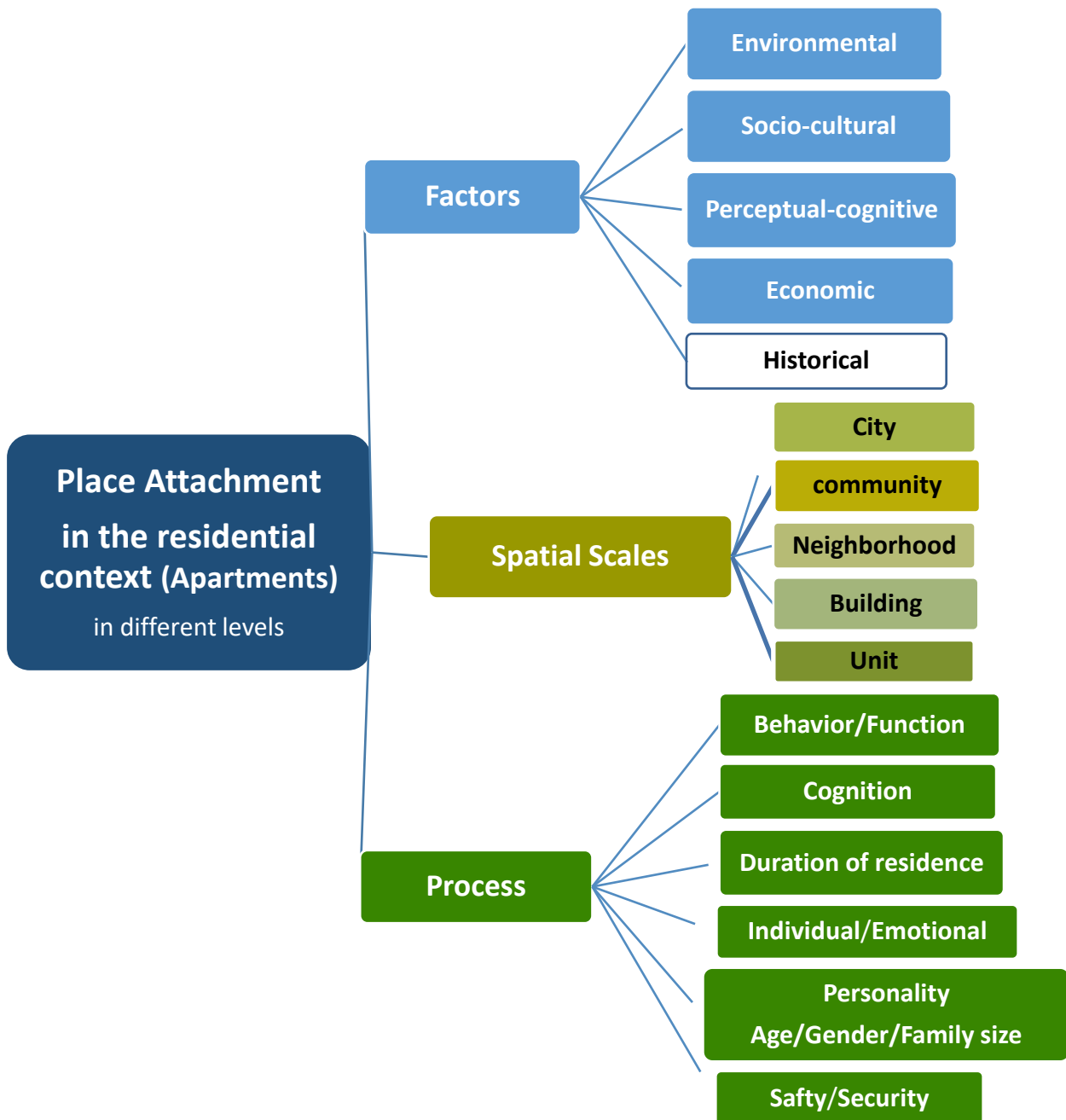
Diagram 2. Key findings in the field study

Scales of Belonging: The community scale consistently scored higher than both the unit and building scales across various residency durations. This pattern suggests that the social dynamics within the community, including interactions with neighbors and communal activities, play a pivotal role in shaping an overall sense of belonging. This finding warrants deeper exploration into how social factors influence attachment to place.

By incorporating these insights into the discussion section, the research underscores the complexity of factors influencing the sense of belonging. It highlights the importance of using a combination of visual and textual questionnaires in user research to capture diverse perspectives effectively. This methodological approach acknowledges the strengths of each tactic and accounts for user diversity in residential contexts. However, as a limitation, the research acknowledges that user preferences can vary significantly. For instance, while some residents may prioritize luxurious apartment features for a sense of belonging, others may value simplicity and functionality, as indicated in the findings from Table 8. Understanding these varied preferences is essential for developing tailored strategies to enhance place attachment in residential settings.

CONCLUSION

The current study investigates factors influencing residents' attachment to their apartments in Tehran, focusing on five key factors: environmental, social-cultural, perceptual-cognitive, economic, and historical. Environmental factors include both natural elements and physical characteristics of the built environment. Among these factors, the study found the historical factor to be less significant compared to the others in shaping residents' sense of place attachment. Overall, changes in the socio-cultural context were identified as influential in shaping residents' perspectives on attachment to their living spaces.

Furthermore, the study reveals that the sense of belonging to an apartment extends beyond the unit itself and is interconnected with larger scales such as the apartment building, neighborhood, community, and city. Emphasizing the indoor-outdoor connection, particularly the relationship with nature, significantly influences residents' attachment to their living environment. Residents perceive and value their sense of belonging across these various scales, recognizing the importance of each level in their overall attachment to their place of residence.

The study identifies a hierarchical structure of spatial scales: unit, apartment building, neighborhood, community, and city. It underscores that experiencing a sense of belonging at one scale can positively influence feelings of attachment at subsequent scales. However, the study also finds that if residents do not feel a sense of belonging at any of these scales, compensatory effects from other scales are unlikely to fully mitigate this deficiency. Thus, comprehensive place attachment requires fostering attachment across all levels of this hierarchical chain.

In conclusion, developing a sense of belonging to apartments is a gradual process influenced by multiple factors and features. Housing decisions, including policy-making and design, should integrate considerations of these factors across the "neighborhood-apartment-unit" hierarchy. The study recommends conducting post-occupancy evaluations in specific case studies to deepen understanding of the factors influencing residents' sense of belonging.

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