

Evaluation of Place Attachment in Residential Complexes: Exploring the Multifaceted Nature of Geographic Concepts in the Philosophy of Geography in Tabriz Metropolis of Iran

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Abstract

Urban development at various scales encounters challenges that are closely linked to the concept of place attachment, which drives more meaningful and effective actions in urban areas. Place attachment and a sense of place attachment, closely linked to a sense of belonging, emerges from personal memories and spatial experiences. This emotional connection promotes community engagement, social development, and investment by giving each place a unique identity that transforms it into a meaningful space for its residents. While urban spaces and architecture have historically facilitated human-environment interactions, many modern residential areas lack distinctiveness and significance. This study investigates place attachment in residential complexes, specifically focusing on Nasr, Asman, and Rushdieh complexes in Tabriz, Iran. Through a descriptive-analytical approach, data was gathered from 200 residents selected using Cochran's formula. Results show that the physical environment is the most significant predictor of place attachment, with a high beta coefficient of 0.742, emphasizing the importance of thoughtful architectural design and functional amenities. Social and cultural factors also play a significant role in attachment, with social factors positively influencing community bonds (beta = 0.425) and cultural factors contributing indirectly (beta = 0.119). These findings underscore the necessity of a comprehensive approach in urban planning that enhances the physical, social, and cultural aspects of residential spaces, fostering a deeper sense of belonging and identity among residents.

Keywords: Residential complex; place attachment; sense of place; path analysis; geographical concepts

Introduction

Place in geography is a fundamental concept that encompasses a variety of meanings and definitions, referring to a specific piece of land or a larger geographical area. It is considered one of the oldest concepts in geography, with geography and place being intertwined from the beginning (Coelho et al., 2023; Saittakari et al., 2023; Chen et al., 2023). Place is a central concept in geography, ranging from a simple space with significance to a complex area with unique physical and human characteristics that are interconnected with other places. The key components of place include location, locale, and a sense of place. Location refers to the position of a point on Earth's surface, while locale is the physical setting where interactions between people occur. A sense of place involves the emotional connection and personal experiences associated with an area. Place can be examined at various scales and is

dynamic, evolving over time and influenced by globalization, which can impact the physical environment and cultural aspects of a place, leading to changes over time. Central-place theory, introduced by Walter Christaller in 1933, explains the size and distribution of settlements within a system. It focuses on the strategic positioning of central places and their market areas, as well as the functions of different types of settlements. Central places vary in size and function, with higher-order places offering a wider range of goods and services. The theory assumes a consistent distribution of central places across a plane with uniform population density and purchasing power. Consumers aim to minimize transportation costs by patronizing the nearest location that offers the desired goods or services. The location of a central place is determined by its threshold, representing the minimum market area required for economic sustainability. August Lösch built upon Christaller's research by beginning with self-sustaining farms and developing different central-place systems. He introduced specialized locations and discussed why certain central places achieve greater prosperity than others. In 1941, Edward Ullman introduced central-place theory to American academics, sparking empirical studies in regions such as Iowa and Wisconsin to assess its accuracy.

Geographical Philosophy of Place

The idea of "place" in geography is extremely important, especially in urban areas where residential buildings have a significant impact on the city's appearance and overall landscape. Urban spaces are more than just physical structures; they are dynamic environments that influence social interactions and affect individuals and communities (Ghalehtemouri & Kojouri, 2020; Kamran et al., 2020; Carmona, 2021; Gheitarani et al., 2024). The poor quality of many contemporary built environments around the world can be attributed to a complex mix of processes and factors. This substandard quality often arises from various socio-economic trends, such as homogenization and standardization that diminish the unique character of places (Tasan-Kok et al., 2014; Churski et al., 2021; Golestani et al., 2024; Ghalehtemouri, 2024). Additionally, the increasing focus on individualism over collectivism weakens community ties. The privatization of life and culture, coupled with the decline of public spaces, further contributes to the deterioration of urban areas. For example, the fountains in Daley Plaza in Chicago provide a peaceful oasis amidst the surrounding traffic noise, highlighting the importance of considering the multi-sensory experience of urban environments. Concepts like mind maps and feeling maps help us understand that the 'environment' is not just physical but also a mental construct, shaped by individual perceptions and values.

Psychological Dimensions of Place Attachment

The physical and visual distinctiveness of urban environments greatly influence the creation of place images and identities. These attributes play a crucial role in how individuals perceive and connect with their surroundings (Kavaratzis and Hatch, 2013; Shamaei and Jafarpour Ghalehtemouri, 2024). However, it is essential to acknowledge that aggregating environmental images across individuals with diverse backgrounds and experiences can be a contentious issue. The physical characteristics of a city, such as its architecture, landscape, streetscapes, and landmarks, significantly shape how people perceive and identify a place, contributing to its unique image and identity in the minds of residents and visitors (Shamsuddin and Ujang, 2008; Dai and Zheng, 2021; Belanche et al., 2021). The visual elements of a city, including the architectural style, street layout, and prominent landmarks, serve as powerful visual cues that contribute to a place's identity (Ziyadeh, 2018; Ghalehtemouri et al., 2020; Ghalehtemouri et al., 2023; Hoseinpour et al., 2024). Urban environments, often described as 'landscapes,' are rich in symbols, meanings, and values. They are intricate constructions where the concept of "place" influences individual experiences, community dynamics, and the overall

character of cities. Recognizing and highlighting the significance of "place" in geography is essential for fostering sustainable, vibrant, and inclusive urban environments (Calvard, 2015; Movahed & Ghalehtemouri, 2019).

Residential Complexes in Urban Geography

Residential complexes are more than just buildings; they represent the concept of "place" in urban areas. These complexes typically consist of apartment blocks with shared spaces and amenities, as well as centralized heating and ventilation systems (Erell et al., 2012; Happle et al., 2018). Each unit within these complexes serves as a unique living space for households, accessible through public or designated streets. In response to urban population growth, high-rise residential complexes have become a prominent feature of Iranian cities, emphasizing the importance of localizing these structures (Rahimzadeh & Ghalehtemouri 2024; Barrie et al., 2023; Manshour, 2025). This effort in localization goes beyond architecture, aiming to enhance the quality of the environment and foster a sense of belonging among residents. The role of "place" within residential complexes highlights the significance of researchers and designers in shaping these spaces to create a strong connection between inhabitants and their surroundings (Akbar and Edelenbos, 2021; Nursanty et al., 2024; Zangabadi et al., 2024). Urban tall buildings, including residential complexes, play a crucial role in shaping citizens' perceptions of their cities, serving as landmarks that contribute to the legibility of urban environments. Designers and architects are tasked with not only creating physical spaces but also nurturing a harmonious relationship between individuals and their built surroundings (Zielinska-Dabkowska and Bobkowska, 2022; Jalilisadrabad et al., 2024). To achieve this goal, space creators must have a deep understanding of human behavior in various contexts to strengthen the bond between people and their environments.

After analyzing the urban planning landscape of the country and the extensive research conducted in this field in recent decades, it is clear that many urban plans have not met the quality standards required for urban environments (McCormick et al., 2013; Kaplan & Holloway, 2024; Goerzen et al., 2024). A crucial measure of the success of any urban plan is the satisfaction of residents with their living spaces. Apartment living, with its limited and compact spaces, often leads residents to seek solace in public areas (Phillips, 2005; Khaliji & Ghalehtemouri, 2024). The design of residential complexes should find a balance between spaciousness and intimacy, catering to contemporary lifestyles. Despite the conveniences of modern houses, they often do not fully meet the diverse needs of traditional Iranian society, leading to a disconnect from values rooted in a deep connection with nature and vibrant social interactions. (Arnold et al., 2012; Al-Mohannadi et al., 2023; Javdan et al., 2024). One effective approach to designing high-quality residential environments entails the evaluation of such spaces post-occupancy, analyzing users' feedback and experiences, and translating these insights into practical solutions. In this manner, we can strive to create urban spaces that not only meet the physical needs of their inhabitants but also resonate with their emotional and social dimensions, fostering a genuine sense of place and belonging (Boarin et al., 2018; Jafarpour, 2022; Dessouky et al., 2023; Al-Mohannadi et al., 2023). The mass production of housing has often led to a decline in quality and the social status of an area. Despite advancements in housing design, it remains uncertain whether these developments have successfully cultivated a profound sense of attachment to residential spaces and environments (van Veelen & Knuth, 2024). Research indicates that the quality and attributes of the physical environment can indeed align with people's expectations and needs. Within the realm of residential complex design, it becomes evident that the physical layout of these complexes plays a pivotal role in measuring residents' attachment to their place of residence (Ghalehtemouri et al., 2021; Depari & Lindell, 2023). A positive correlation exists between

the physical plan of a residential complex and the residents' sense of place, influencing their perceptions and fostering an inclination to meet their needs and expectations.

Furthermore, the quality of the living environment has a significant impact on residents' attachment to their surroundings, shaping their personal and social identities and influencing their engagement in place-related activities. Neglecting these aspects can present various challenges in urban settings. The physical design of residential complexes plays a crucial role in developing attachment to the place by evoking mental imagery, enhancing aesthetics, facilitating social interactions, enabling activities, and ultimately fostering satisfaction among residents (Shamai & Ghalehtemouri, 2024; Golestani et al., 2024). Recent research on the assessment of residential environments has highlighted the importance of measuring attachment to one's place of residence, underscoring its significance in evaluating the overall quality of residential settings (Kojuri et al., 2020; Amini et al., 2022; Martinez-Soto et al., 2024; Marvi et al., 2024; Meetiayagoda et al., 2024; Shamai & Ghalehtemouri, 2024). Exploring the literature on attachment to place reveals that it is a multifaceted concept with interconnected components. Recognizing attachment as a distinct issue can greatly impact efforts to improve the quality of residential environments (Wójcik et al., 2024; Kajosaari et al., 2024; Li et al., 2024). The concept of the quality of the living environment emerged following the first United Nations Habitat Summit in 1976, in response to the increasing crises in urban life across various dimensions—environmental, social, physical, and economic (Hardoy et al., 2013; Eizenberg & Jabareen, 2017; Marvi et al., 2024; Ebbini & Bleibleh, 2024). Place and space are two crucial concepts in geography, with geography being the first science to mention their roles. Subsequently, they have played significant roles in other fields of science such as physics, sociology, philosophy, and astrology. However, geographical research has primarily focused on space. The aim of this research is to evaluate attachment to residential complexes by implementing a path-finding model that incorporates social, physical, and cultural variables. By examining the interaction of these elements, the study seeks to address the existing gap in understanding attachment dynamics within residential environments, ultimately contributing to the improvement of the quality of these spaces.

Theoretical foundations

Place and space in architecture and urban planning

In the field of architecture and urban planning, the interaction between place and space is a key concept that shapes how individuals and communities engage with their surroundings. Man-made space is more than just a physical structure; it is a complex network of relationships involving interactions among people and between people and the places they occupy (Chen et al., 2018). Central to this idea is the understanding that a place is essentially a space that holds significance for an individual or a group. This idea is captured in the equation "place = space + meaning" (Tian and Wise, 2022). A place is created when individuals form a personal connection with their environment, reflecting their experiences and knowledge (Baum et al., 2024).

In essence, place is a unique space enriched with the significance and values attributed to it by its users. In direct contrast to mere space, place denotes a profound, impactful connection between an individual and a specific location (Raymond et al., 2017). The sense of place is profoundly influenced by both individual and collective values. At the same time, it shapes these values, attitudes, and, notably, the behavior of individuals and communities within that place. People often engage in social activities in accordance with their sense of place (Strzelecka et al., 2017). Understanding the dynamics of place and space is integral to the fields of architecture and urban planning, as it informs the design and development of environments that resonate with the people who inhabit them. It underscores the importance of not only

physical aspects but also the meanings, values, and experiences that individuals attach to the spaces they call "place." Attachment to a place is a complex and multi-dimensional concept, and researchers have proposed various perspectives to define its dimensions and understand the factors that contribute to it. There are two predominant views regarding the dimensions of attachment to a place:

A - The First Point of View: In this perspective, attachment to a place arises when it satisfies both the practical needs and expectations of individuals, constituting the performance dimension of attachment (Scannell and Gifford, 2010). This dimension pertains to the fulfillment of individual requirements and objectives. Simultaneously, attachment involves aligning with one's mental constructs, which encompass the emotional dimension. The emotional dimension is intricately linked to sensory interactions between individuals and their environment and plays a role in shaping individual identity. A sense of attachment, coupled with the imbuing of meaning into one's life, engenders responsive behaviors towards that place (Lewicka, 2011).

B - The Second Point of View: This viewpoint defines place attachment through two dimensions: place dependence and place identity. Place dependence, in turn, encompasses three dimensions: 1- The ability of a place to meet individual needs. 2- Sensory experiences related to the place. 3- The extent of an individual's prior experiences in that place (Rollero, 2010).

Factors Influencing the Formation of Attachment to a Place:

Studies conducted in the field of attachment to a place have identified various influencing factors, with cultural, social, and individual factors playing significant roles (Chen, 2018). These factors can be categorized as follows:

Cultural, Social, and Individual Factors: A) Individual characteristics, including demographic factors, the nature of an individual's relationship with a place, place selection criteria, duration of stay, and lifestyle. B) Cultural characteristics, such as the extent of engagement in social networks and cultural interactions, rooted in an individual's participation in the place. C) Social characteristics reflect how an individual interacts with others in a place. Positive social relationships strongly influence a person's decision to stay in a place, creating a sense of belonging and unease when severed (Fried, 2000).

Physical Factors: The physical dimension of a place directly impacts attachment, encompassing factors like the presence of amenities and services, organizational structure, accessibility, architectural layout, and aesthetics. These elements ultimately contribute to the satisfaction derived from the place.

Contextual Factors: The location of a place within the urban environment, its connectivity with the surroundings, historical and contextual background, all significantly influence attachment to the place.

Time Factor: Time is a factor in the development of attachment to a place. The duration of familiarity with a place, the frequency of use, and the length of residence can instigate attachment in individuals and groups, sometimes independently of other dimensions (Toit, 2013).

The diversity of definitions related to attachment to a place presents a challenge for researchers in this field. Attachment to place can be explored from two main approaches, which may be analyzed in phenomenological and psychological forms (Dowell, 2003). Understanding attachment to place involves considering its intricate dimensions and the myriad factors that contribute to the formation of this complex bond between individuals and their environments.

Table 1- The most important theories of phenomenologists regarding attachment to place

Sholars	Criteria
(Tuan, 1977)	A profound attachment to a place is forged through simple yet significant elements, like your familiarity with the location, the assurance of growth and security it offers, and the cherished memories of scents and sounds associated with shared activities and the friendships that evolve over time.
(Relph, 1976)	The experience of a place can be categorized into seven distinct levels based on varying degrees of being within or outside that place. These levels give rise to distinct identities in relation to different places for different individuals. Human experiences attain varying qualities of meaning and emotion as a result. Consequently, a profound attachment to a place is cultivated in the innermost levels of the place experience.
(Seamon, 1979)	He regarded attachment to place as one of the dimensions within a comprehensive living structure known as "place and the experience of place." In a productive perspective, attachment to place is intricately linked to six place-related processes: Place Interaction Place Identity Place Creation Enrichment of Place Understanding of Place Release of Place In an ideal setting, all these six processes coexist and interconnect in a dynamic and intricate interplay that often defies predictability.

Table 2- The definition of place attachment from the point of view of psychologists

Scholars	Definition of attachment to place from the point of view of psychologists	Importance in the history of the study of attachment to place
(Stokols and Shumak, 1981)	The term "place attachment" refers to a positive emotional bond between individuals and their living environment.	The first definitions of place attachment
(Williams and Roggenbuck, 1989)	Attachment to a place encompasses a positive emotional connection between an individual and their living environment. It consists of two key dimensions: satisfaction with the place and attachment to it.	The first multifaceted definition of place attachment

(Low & Altman, 1992).	Altman and Love posit that place attachment is a multifaceted concept encompassing various facets of the emotional connection between an individual and a place. It contributes to the formation of individual and collective identities and is deeply intertwined with one's sense of self and culture. This perspective sees place attachment as a holistic concept consistent with viewpoints such as phenomenology, and it includes the following components: 1. Process of Attachment (Cognition, Feeling, Behavior): Place attachment involves a dynamic process that encompasses cognitive, emotional, and behavioral dimensions. These processes together form the intricate relationship between a person and a place. 2. Diverse Types of Place: Places can vary widely in terms of scale, characteristics, and tangibility. They can be real, mythical, virtual, or purely imaginary, each with its own unique attributes that influence attachment. 3. Multiple Actors (Individuals, Groups, Cultures): Place attachment extends beyond the individual level. It involves various actors, including individuals, groups, and entire cultures, each contributing to the collective attachment to a place. 4. Various Forms of Social Communication: Place attachment is shaped and expressed through diverse forms of social communication. These include individual expressions of attachment, group dynamics, and cultural narratives and practices. In summary, place attachment is a comprehensive and intricate concept that encompasses cognitive, emotional, and behavioral processes. It can manifest across different types of places, involve multiple actors, and be expressed through various forms of social communication. This holistic perspective highlights the richness and complexity of the bond between people and the places they inhabit.		The first book about place attachment. Various definitions about place attachment
	Hidalgo and Hernandez (2001)	Place attachment is a positive emotional connection between an individual and a specific	

	location, characterized by a strong desire to remain in proximity to that place.	
(Scannell and Gifford, 2010).	Place attachment is an emotion that occurs between people and their meaningful environment.	Presenting a comprehensive model of place attachment
(Giuliani, 2003)	Attachment to a place refers to feelings towards a place, including a sense of belonging, a desire to be close to a place, and a desire to return to a place when one is far away from it.	Presenting a comprehensive review article about attachment to place and stating the weaknesses of research related to it

This study introduces a theoretical framework on place attachment, specifically focusing on a residential complex. Attachment to a residential complex involves positive internal feelings that individuals have towards the open spaces in the complex. These feelings stem from emotional, cognitive, and behavioral interactions with the residential environment, leading to a sense of dedication to the place and a desire to maintain the relationship with it. The process of attachment progresses through different phases, highlighting the importance of emotional, cognitive, and behavioral factors in shaping individuals' attachment to their residential complex and influencing their long-term commitment to and connection with the place.

Scope of Study

The study is centered on the city of Tabriz in East Azerbaijan, Iran, which has historical significance and was a key city along the Silk Road. Tabriz has undergone changes over time, shaping its physical appearance and influencing the perceptions of its residents. While some parts of the city have evolved with urban growth, others have maintained their original characteristics. The central areas of Tabriz, often seen as old and run-down, have been undergoing renovation. This continuous transformation may affect the emotional connection of residents to these areas. In recent years, Tabriz has seen significant development, especially in the eastern and northeastern parts as it expands towards Tehran. This expansion has led to the growth of suburban areas like Nasr, Rushdieh, Baghmisheh, Valiasr, Vilashahr, and Zafaranieh. The research focuses on residential complexes in these expanding areas, such as Asman Tower, Negin Tower and Negin Complex, Rushdieh Complex, and Tarlan Complex, to explore the attachment of residents to these complexes in the changing urban landscape of Tabriz.

Research method

This research employed a structured methodology to investigate attachment to place and the influencing factors. The process is outlined as follows:

1. Initial Data Collection:

- Interviews were conducted with residents to identify their perspectives on open spaces within their residential complexes.
- Preliminary insights from these interviews were used to create an initial questionnaire.

2. Questionnaire Development and Validation:

- The questionnaire was developed based on the initial insights gathered from interviews.
- Residents reviewed and provided feedback on the questionnaire's questions, leading to initial modifications.
- A total of 200 questionnaires were distributed to residents in Rushdieh, Nasr, and Baghmisheh to assess attachment to place and its influencing factors.
- Morgan's sample size table was utilized to determine the sample size of 200 residents for these areas.
- Random and stratified sampling methods were employed to ensure diversity in the sample, considering factors such as age, education, and gender.

3. Data Collection:

- Data on attachment to place and related factors were collected through the administered questionnaires.
- The questionnaire employed a Likert scale with four response options ranging from "very low" (score 1) to "very high" (score 4).

4. Reliability and Validity Assessment:

- The reliability of the questionnaire was assessed using Cronbach's alpha coefficient, with values above 0.7 indicating instrument reliability.
- To validate the questionnaire, multiple methods were employed:
 - Face validity was ensured through review and input from professors and experts.
 - Pearson's correlation test, t-tests, and path analysis were used for data analysis within the SPSS software environment.

Table 3 - General Characteristics of Elite Respondents and Experts:

This comprehensive research methodology was implemented to gather and analyze data related to attachment to place and its determinants, ensuring the reliability and validity of the study's findings (Table 3).

Table 3- General characteristics of elite respondents and experts

General information	General profile factors	Total average	Total frequency
Mean age (year)		37.5	200
Education	Bachelor	28.6	48
	Master	36	59
	PhD	35.4	93

Research findings

Table 4 reveals that the highest average score is associated with the "Mixing of Uses" component, with an average score of 4.15. Conversely, the lowest average score is attributed to the "Social Surveillance of Public Spaces" component, which has an average score of 2.17. These findings indicate variations in residents' perceptions of these specific components in relation to attachment to place. In this research, a total of 15 components were examined within three distinct variables: physical, social, and cultural. The following table provides descriptive statistics of these variables:

Table 4 - Descriptive Statistics of Variables

Variable	Mean	Standard deviation	Mean standard error
Identity and belonging	4.07	0.94	0.088
The centrality of public areas	3.71	1.28	0.119
Realization of citizens' participation in affairs	3.59	19.1	0.111
Local community formation	4.02	1.05	0.141
Social surveillance of public spaces	2.17	1.15	0.107
Fair access to opportunities	3.41	1.0	0.101
Readability of the environment	3.71	0.99	0.092
Adequacy of local services	4.25	0.73	0.069
Mixing of uses	4.41	1.18	0.114
Compatibility and usefulness of users.	3.82	0.88	0.083
Visual frequency	4	0.99	0.093
The use of native and symbolic elements	4.8	0.84	0.079
Visual diversity	3.9	1.45	0.136
Visual compatibility	3.98	0.96	0.089
Unity of components	4.15	0.79	0.074
Chi-square test	502.526		
Degrees of freedom	15		
level of significance	0.000		

Table 5 displays the significance levels for the correlation between the components and the variables, with a confidence interval of 95%. The table indicates that all components used in this research exhibit a significance level of less than 0.05 for their correlation with the variables. This suggests that there is no significant difference between the components and the variables, signifying a high correlation between them.

Table 5- The level of attachment in the studied residential complexes

Variables	t statistic	Degree of Freedom	Significance level	95%confidence interval	
				upper limit	lower limit
Identity and belonging	1.46	17.0	199	0.000	1.43
The centrality of public areas	0.67	7.85	199	0.000	1.16
Realization of citizens' participation in affairs	1.11	14.13	199	0.000	1.29
Local community formation	0.63	8.45	199	0.000	0.91
Social surveillance of public spaces	0.71	14.72	199	0.000	1.18
Fair access to opportunities	0.93	13.07	199	0.000	1.24
Readability of the environment	0.21	3.08	199	0.000	0.61
Adequacy of local services	0.16	3.24	199	0.000	0.67

Mixing of uses	1.03	8.68	199	0.000	0.71
Compatibility and usefulness of users	0.74	1.29	199	0.000	1.3
Visual frequency	0.63	6.54	199	0.000	1.17
The use of native and symbolic elements	0.80	10.26	199	0.000	1.16
Visual diversity	0.29	4.26	199	0.000	0.71
Visual compatibility	1.11	15.25	199	0.000	1.3
Unity of components	0.31	4.26	199	0.000	0.56

Therefore, the statistical analysis presented in Table 5 underscores the strong correlation between the components examined in this research and the variables related to attachment to place in the studied residential complexes.

Assessing the correlation between attachment components

One of the tools suitable for analyzing variables in this research is Pearson's correlation coefficient. It is widely used to measure the relationship between two variables, as shown in Table 6. The correlation between the attachment components is positive, indicating that as one component increases, the other also increases, and vice versa.

Table 6- Correlation of research components				
Variables		Cultural	Social	Physical
Physical	Correlation Coefficient	0.238	0.428	1
	Sig. (2-tailed)	0.1	0.00	0.00
Social	Correlation Coefficient	0.471	1	0.428
	Sig. (2-tailed)	0.00	0.00	0.00
Cultural	Correlation Coefficient	1	0.471	0.238
	Sig. (2-tailed)	0.00	0.00	0.00
	Sig. (2-tailed)	0.00	0.00	0.172

According to Table 6, it can be seen that there is a relationship between cultural and social components with a higher score of 0.471, and the lowest relationship is related to cultural and physical components.

Path analysis for attachment components

The path analysis technique relies on multiple regression analysis and assumes relationships between independent and dependent variables. It utilizes a path diagram to visually represent these relationships, emphasizing the connections between variables. Directional arrows in the diagram indicate the relationships and effects between variables in the path analysis.

The main assumptions in path analysis

1. The relationships between the variables in the linear model are additive and causal, and curvilinear and interactive relationships are not taken into account.
2. The remaining variables are not correlated with each other and with the variables that were included in the model before.
3. The flow of causality in the device is one-way and mutual causality between variables is not considered.

In this method, we examine four variables, physical, social, cultural, and the sum of these three variables, which is attachment. In the first stage, attachment is considered as dependent variable and other three variables as independent variables. According to the results, the variable with a beta of 0.742 has the greatest effect on the attachment variable. Based on this result, one standard deviation in the physical variable increases the amount of attachment by 0.742 standard deviations, on the contrary, reducing one standard deviation in the physical variable causes a decrease in the standard deviation in the attachment variable. Also, beta related to social and cultural variables is 0.425 and 0.119 respectively (Table 7).

Table 7- Examining the relationship of attachment with physical, social and cultural components

Sig	T	Standardized Coefficients	Unstandardized Coefficients		Model
		Beta	Std. Error	B	
0.0106	1,626		0.107	0.173	(Constant)
0.00	4,705	0.742	0.043	0.091	Physical
0.00	6,996	0.425	0.022	0.134	Social
0.00	7,726	0.119	0.018	0.138	Cultural

Conclusion:

This study delves into the complex nature of place attachment in residential complexes in Tabriz, highlighting how physical, social, and cultural factors collectively influence residents' emotional ties to their living spaces. The research indicates that physical aspects, such as architectural design, spatial layout, and accessibility, have the most significant impact on place attachment, as indicated by the highest beta coefficient (0.742). This emphasizes the importance of creating functional and visually appealing environments to enhance resident satisfaction and emotional connections. Social factors, with a beta coefficient of 0.425, also play a crucial role in fostering attachment through community engagement, shared activities, and neighborhood cohesion. The strong correlation (0.471) between social and cultural elements suggests that cultural traditions and collective identity strengthen social bonds, contributing to residents' sense of belonging. While cultural components (beta = 0.119) have a more indirect influence, their integration with social factors underscores their role in maintaining community resilience and place identity.

Practical Implications and Recommendations

To enhance place attachment in urban residential settings, policymakers and planners should adopt a **holistic strategy**:

1. **Physical Design Interventions:** Prioritize mixed-use developments, pedestrian-friendly layouts, and adequate local services (e.g., the "Mixing of Uses" component, which scored highest at 4.15) to improve functionality and aesthetic appeal.

2. **Social Infrastructure Development:** Strengthen communal spaces and participatory governance (e.g., addressing the low score of 2.17 for "Social Surveillance of Public Spaces") to encourage interaction and collective ownership.
3. **Cultural Preservation:** Incorporate native symbolic elements (scoring 4.8) and visual diversity into urban design to reflect local heritage and foster cultural continuity.

Aligning these dimensions can transform urban environments into vibrant, inclusive communities that meet practical needs and foster lasting emotional connections. Future research should investigate long-term effects and contextual adjustments to enhance these strategies for various urban landscapes.

Limitations

1. **Context-Specific Findings:**

The study's emphasis on residential complexes in Tabriz may restrict the applicability of the findings to different urban or cultural settings. Regional economic conditions, housing regulations, and local customs may impact place attachment in varying ways in other environments, highlighting the need for additional validation across a range of geographic and demographic contexts.

2. **Subjective Perceptions and Self-Reporting Bias:**

Relying on residents' self-reported data may introduce biases like social desirability or recall inaccuracies. For example, the low score of 2.17 for "Social Surveillance of Public Spaces" could be more about perceived safety than actual conditions. To address this, future studies could combine surveys with observational data or behavioral metrics to minimize subjectivity.

3. **Static Analysis Amid Dynamic Urban Change:**

The research captures a snapshot of place attachment components without accounting for temporal shifts, such as urban expansion, gentrification, or evolving social dynamics. For example, the high importance of "Mixing of Uses" (4.15) might shift as neighborhoods densify or land-use policies change. Longitudinal studies would better reveal how attachment evolves over time.

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