

Original Research Article

Analysis of the Correlation Between Physical-Spatial Structure and Behavioral Patterns of Residents in Informal Settlements (A Case Study of the Morteza Gerd Neighborhood, District 19, Tehran)*

Reza Fatahi¹, MohamadReza Khatibi^{1**}, Vahid Bigdeli Rad¹

1. Department of Urban Planning, Faculty of Architecture and Urban Planning, Qazvin Branch, Islamic Azad University of Qazvin, Qazvin, Iran

Received: 06/10/2025

Accepted: 22/12/2025

Available online: 23/07/2026

Abstract

Problem statement: Informal settlements, as a growing phenomenon in metropolitan areas, face numerous physical, social, and behavioral challenges. One of the less studied aspects is the role of the physical structure of these settlements in shaping the behavioral patterns of residents. This study examines the role that physical-spatial characteristics play in shaping the daily behavior of residents.

Research objective: The main objective of this research is to analyze the relationship between the physical-spatial structure and behavioral patterns of residents in the Morteza Gerd neighborhood as an example of an informal settlement in District 19 of Tehran. A secondary objective is to identify the types of behavioral spaces formed in response to this structure.

Research method: This study was conducted using a mixed-method (quantitative and qualitative) approach with an applied focus. Data were collected and analyzed using various techniques, including library studies, field observations, the distribution of 378 questionnaires among residents, spatial analysis of the area's physical structure (using the Space Syntax method), and prioritization of the studied zones based on research criteria (using the TOPSIS technique).

Conclusion: The results show that the physical-spatial structure plays a crucial role in shaping residents' behavior. Zones with better access, appropriate land uses, and more open space fostered richer social behaviors and a higher sense of belonging. In contrast, zones adjacent to industrial uses or with poor access were linked to decreased social interactions and a sense of insecurity. Overall, this study concludes that any planning initiative to improve the quality of life in these settlements must start with improving the physical-spatial structure and carefully considering its relationship with resident behavior.

Keywords: *Physical-spatial structure, Informal settlement, Behavioral pattern, District 19 of Tehran.*

Introduction and statement of the problem

Informal settlements are an unstable form of housing for low-income groups, typically characterized by scattered growth and a lack of official permits.

Consequently, they often lack healthy living standards and face multifaceted social, economic, cultural, physical, and environmental challenges. Given widespread poverty and the pursuit of better access

This article is taken from Reza Fatahi's doctoral thesis entitled "Analyzing the impacts of the physical-spatial structure of informal settlements on behavioral patterns (Case study: District 19 of Tehran)" which is being conducted under

the guidance of Dr. "MohamadReza Khatibi" at Islamic Azad University of Qazvin.

**Corresponding author: 09127838527, Mr.khatibi@iau.ac.ir

to urban facilities, the population living in informal settlements—both in Iran and globally—continues to grow. This represents a significant phenomenon in cities, particularly metropolises, and neglecting it only exacerbates the associated problems.

Most studies on informal settlements have focused on explaining their formation, their physical and social characteristics, and the problems they face. Considerable attention has also been paid to the issue of crime within these urban structures due to its impact on surrounding areas.

However, one of the less studied aspects is the role of the physical-spatial structure and its interaction with other factors in shaping residents' behavioral patterns. The relationship between space and behavior, or environment and society, has been explored in both social sciences (e.g., aesthetics, sociology, psychology) and environmental sciences (e.g., architecture, geography, urban planning). This interdisciplinary inquiry has led to theoretical models that provide a useful framework for developing space-based approaches to urban behavior management. One such model is the field of environmental or ecological psychology. Formed as an interdisciplinary specialty, it aims to study behavior psychologically in relation to physical settings. This field has prompted a paradigm shift from a primary emphasis on the individual to a greater emphasis on the environment. This shift, in turn, has led to theories such as behavioral setting theory, which explains human activity patterns based on the immediate physical-social context.

Identifying behavioral patterns and behavioral settings within a context can help us understand how the physical and spatial structure, alongside and in interaction with other social, economic, and cultural factors, can provide a ground that either facilitates or restricts the emergence of specific behaviors. In fact, this investigation seeks to understand how changes in the physical environment, alongside other interventions, may lead to the modification of social behavior. Indeed, by identifying behavioral patterns in informal settlements, it may be possible to largely explain the contexts and processes behind the social

problems of these settlements regarding the formation of various crimes, delinquent groups, addiction, corruption, prostitution, etc. At higher levels, reasons for the lack of social participation, vandalism, etc., which are definable at the level of social activities, can also be explained in these settlements by considering the set of influential factors.

District 19 of Tehran has been selected as the case study for this research. The characteristic of Tehran as the capital, along with the uneven distribution of facilities and infrastructure compared to other cities, leads to the attraction of a large population to this city. A population that, disillusioned with the possibility of residing within the city limits, opts to live on its periphery. So much so that in recent years, many of Tehran's rural and peripheral settlements have turned into cities due to population growth, yet they still lack the characteristics of a complete city with appropriate social, physical, cultural, economic, and infrastructural structures that would allow them to function independently of Tehran. Accordingly, this research seeks to answer the question: what role does the physical-spatial structure of informal settlements play in shaping the behavioral patterns of residents, in interaction with other factors (social, economic, cultural, etc.)? Furthermore, this subsidiary question is also raised: what specific behavioral settings are formed in informal settlements?

Research Background

Theil (1962), by inventing the «method of space measurement and counting,» is considered a pioneer in the objective measurement of motor responses to physical stimuli (Paknejad & Latifi, 2019). Subsequently, Appleyard, Lynch, and Myer (1964), with the publication of the book *The View from the Road*, laid the foundation for visual-behavioral studies at the urban scale and presented methods for measuring spatial experience (Forutan Rad & Zamani, 2022). Following this, Barker and his colleagues, by proposing the ecological-behavior theory and behavior settings, established the foundations of ecological psychology and emphasized the role of environmental settings in shaping behavioral systems at small scales.

Accordingly, environmental psychology, as an interdisciplinary field, examines the reciprocal relationships between an individual's behavior and their surrounding physical environment. Since the 1960s, starting from the realm of urban visual perception and later with the development of ecological-behavioral theory and behavior settings, it has provided a suitable theoretical framework for analyzing the systematic interaction between space and behavior.

In recent years, numerous studies have also been conducted in the field of behavioral patterns. Vidal et al. (2022), by studying human behavior patterns in public urban green spaces in Porto, showed that patterns of space use at different times of the day are related to user profiles and design elements, highlighting for planners the necessity of simultaneously considering users' socio-demographic backgrounds and the physical environment. Jo and Jeon, (2020), investigating the influence of human behavioral characteristics on the perception of the soundscape in urban parks, also found that the primary determinant of park preference is not the type of human activities, but rather the presence or absence of people. Prior to that, Yanlong et al. (2017), in a study on urban green spaces, found that factors such as perceived safety and personal attitudes influence individuals' behavioral intentions more than pure physical features, which underscores the importance of perception and psychological factors alongside the spatial structure.

In Iran, a study in 2024 examined the reciprocal relationship between the physical characteristics of housing and the territorial behavior of residents in informal settlements in Ilam. This research revealed that perceptual-cognitive concepts (such as privacy and security) as well as socio-economic factors play a decisive role in shaping housing patterns (Mirzabeygi et al., 2024). A comparative study by Rokhsari et al. in 2019, using the mental mapping method and qualitative analyses in GIS software, demonstrated that the elements of the physical space are perceived entirely differently by residents of formal and informal settlements in Rasht. The perception of informal settlement

residents is primarily focused on everyday living and livelihood spaces, whereas the perception of residents in formal areas encompasses modern commercial and recreational spaces. Hosseinzadeh Dalir et al. (2021), in an article titled «Investigating the Impact of Urban Spaces on Citizens' Behavioral Patterns,» also showed a significant correlation between urban landscape components and citizens' behavioral patterns. Paknezhad & Latifi (2021), in an article titled «How Behavioral Patterns are Formed in the Spatial Organization of Neighborhoods,» examined criteria such as degree of control, connectivity value, relative asymmetry, mean depth, and total depth using the two tools «Agraph» and «Depthmap.» The results of this research indicate that the extent of influence and formation of individuals' spatial behavior depends on their unique internal and personality characteristics, in addition to the five senses and mental images of the environmental structure. Furthermore, Alidoost Masouleh and Haghighatbin (2021), in an article titled «Using Space Syntax to Analyze Behavioral Settings,» showed that individuals utilize locations with design openness and proximity to active social settings as mental behavioral settings, based on subjective characteristics and regardless of the physical value of those spaces.

Accordingly, global studies in behavior analysis have primarily focused on urban green spaces, acoustic landscapes, and user behavioral intentions, utilizing methods such as behavioral mapping, questionnaires, and statistical analysis. Iranian studies have also examined behavioral patterns in public spaces (parks, squares, pedestrian walkways) and analyzed the role of physical, visual, social, and environmental components on user behavior. Studies related to informal settlements have largely concentrated on the physical, social, and economic dimensions of these settlements (such as the sustainability of open spaces, crime analysis, housing indicators, resilience, and meanings of dwelling).

Accordingly, despite the substantial volume of studies in the fields of behavioral patterns and informal settlements, no independent research has examined

the relationship between spatial-physical structure and behavioral patterns in informal settlements through the lens of environmental psychology and behavioral settings. Consequently, existing studies in the area of informal settlements have primarily focused on macro-level physical, economic, and social issues, while the analysis of spatial morphology and its influence on the daily behaviors of residents has been overlooked.

Therefore, the innovation of this research can be explained at three levels: At the theoretical level, by integrating the theoretical frameworks of «behavioral settings» and «ecological environmental psychology» and applying them to the study of informal settlements, this research seeks to move from single-factor explanations toward interactive and multi-factor explanations of the space-behavior relationship. The focus is on examining the spatial structure not as a «determinant» but as an «enabling and facilitating factor» alongside other variables. At the subject level, the specific focus on identifying and analyzing «behavioral settings» in the fabric of the informal settlement in Tehran's District 19—as a key and under-studied example of Iranian metropolises—constitutes the thematic innovation of this work. The aim is to discover which locations within this fabric serve as cores for the formation of behavioral patterns (whether desirable or undesirable). At the practical level, the findings of this research can provide a basis for designing targeted socio-environmental interventions. Rather than proposing purely physical or purely social solutions, this study aims to offer an insight into how changes in environmental design, alongside other programs, can regulate and guide collective behaviors toward improving residents' quality of life.

In short, the novelty of this research lies not in studying informal settlements or behavioral patterns in isolation, but in «looking at old issues through a new lens» (environmental psychology and behavioral settings) and deriving «new (space-based) solutions from this perspective.»

Theoretical Foundations

Generally, regarding the relationship between

environment and behavior, four theoretical positions can be distinguished: the voluntaristic approach, the deterministic approach, the possibilistic approach, and the probabilistic approach.

The voluntaristic approach holds that the environment has no effect on human behavior. Given that there are serious constraints on human behavior, such as certain biological characteristics, the voluntaristic approach is indefensible (Lewontin, 2000). From the deterministic approach viewpoint, each stimulus elicits a specific response, and the role of individual awareness and will in generating the response is ignored (Jung, 1987). The doctrines of the Modern Architecture movement were founded on deterministic presuppositions, and it is based on this approach that modern architecture designers expect people to act according to the physical plan and based on their desires and predictions (Faghirnavaz et al., 2021). All the philanthropic social movements of the late 19th century, which culminated in Ebenezer Howard's Garden City movement and the formulation of housing design patterns, were influenced by the belief in architectural and physical determinism.

The belief in architectural determinism was reinforced by designers' simplistic interpretation of studies by individuals such as Leon Festinger, William Whyte, Leo Kuper, Herbert Gans, Burt Adams, and Holohan and Siegart. All these studies indicate a strong relationship between aspects of physical environmental design and patterns of social interaction. Accordingly, designers have often used a simple stimulus-response model to explain the relationship between the built environment and human behavior (Lang, 2009). However, newer studies point to a two-way relationship between humans and their surrounding environment, leading to the formation of possibilistic and probabilistic approaches.

The possibilistic approach considers the physical environment as a setting that creates opportunities and constraints for behavior, but the environment does not determine behavior. Rather, people choose specific behaviors based on other criteria. In other words, the environment merely provides

the possibility for certain behaviors to occur or creates constraints for the occurrence of others, but ultimately, people's choices are made based on cultural criteria, value systems, and people's beliefs and attitudes (Latifi & Sajadzadeh, 2014). From the probabilistic perspective, while people exhibit various behaviors in an environment, design features and factors of the built environment increase the probability of specific behaviors occurring. Thus, the environment supports a particular behavior and increases the likelihood of its occurrence (Sarbandi Farahani et al., 2014). Behaviorism in urban planning is based on the idea that the design of the physical environment can shape, reinforce, or limit human behaviors. This approach is rooted in Skinner's (1938) theory of operant conditioning and Bandura's (2016) social learning theory.

Furthermore, regarding behaviorism in urban planning, theories such as Behavior Settings (Barker, 1968), Environmental Load Theory (Milgram, 1970), Theory of Environmental Psychology (Gibson, 1979), Stress Recovery Theory (Ulrich, 1984), Attention Restoration Theory (Kaplan & Kaplan, 1989), Behavioral Architecture (Zeisel, 2006), Nudge Theory (Thaler & Sunstein, 2008), and Biophilic Design (Kellert, 2008) have also been proposed, which can be summarized in a table such as Table 1.

Accordingly, theories related to behavior can be categorized into three main approaches:

- Behaviorism (Skinner, 1938) emphasizes learning through environmental stimuli and conditioning, focusing on observable behaviors.

- Environmental Psychology (Gibson, 1979) investigates the influence of the physical and cultural environment on human behavior and subjective experiences, analyzing deeper dimensions of emotion and perception.

- Behavior Settings (Barker, 1968) is a practical concept in designing living environments, referring to the correlation between behavioral patterns and the physical characteristics of the environment.

The alignment of these theories can be summarized as follows.

- Emphasis on the Role of Environment: All three approaches believe that the environment—both physical and social—plays a significant role in shaping behavior. In behaviorism, behaviors are formed in response to environmental stimuli; in environmental psychology, environmental design and features affect individual emotions and perceptions; and in behavior settings, the physical environment aligns with behavioral patterns to form a meaningful unit.

- Learning and Repetition: Behaviorism explains behavior through learning via conditioning; environmental psychology also examines how environmental experiences influence behaviors; and behavior settings are those recurring patterns within a specific space.

- Application in Design: All three domains are applied in practical fields such as urban design, architecture, and environmental planning.

These theories also have differences.

- Traditional Behaviorism (Skinner, 1938) neglects the role of cognition, whereas Bandura (2016) incorporates indirect learning and self-efficacy into the framework.

- Environmental Psychology may address unintended environmental effects (such as stress), whereas Behavior Settings primarily emphasize purposeful design for specific behaviors (Zeisel, 2006).

- Environmental Psychology attends to cognitive processes (e.g., perceiving environmental aesthetics), whereas Classical Behaviorism focuses solely on observable responses.

Regarding informal settlements, the most comprehensive definition belongs to the United Nations, which describes informal settlements as urban areas that have developed outside the legal framework and formal planning. These settlements typically emerge due to large-scale migration from rural to urban areas, a shortage of affordable housing, and the inability of governments to meet the housing needs of low-income populations (UN-Habitat, 2015). Characteristics for this type of urban fabric have been described across physical, functional, economic, environmental, and socio-cultural dimensions.

Given that the physical dimension is more visibly

Table 1. Theories regarding Behaviorism, Environmental Psychology, and Behavior Settings. Source: Authors.

Group	General Concept	Theory	Theorist	Year	Key Concepts	Application in Urban Planning
Conditioning Theories	Emphasize the influence of the environment on behavior through stimuli and consequences.	Classical Conditioning	Ivan Pavlov	1927	Creating involuntary responses by pairing a neutral stimulus with an unconditioned stimulus.	Foundation for understanding associative learning and the effect of the environment on behavior.
		Operant Conditioning	B.F. Skinner	1938	Shaping voluntary behaviors through consequences (reinforcement or punishment).	Designing spaces that encourage desired behaviors (e.g., walking) through environmental rewards.
Social Learning Theory	Highlights the role of observation and imitation in shaping behaviors.	Social Learning	Albert Bandura	1977	Learning through observing and imitating the behavior of others.	Designing public spaces that facilitate interaction and observation of positive behaviors.
Environmental Theories	Focus on the reciprocal relationship between the physical environment and human behavior.	Behavior Settings	Roger Barker	1968	Physical environments automatically generate patterns of behavior.	Designing environments that enhance social interactions (e.g., urban squares).
		Environmental Load Theory	Stanley Milgram	1970	Crowded or complex environments cause sensory overload and stress.	Designing low-stress, tranquil urban spaces.
		Environmental Psychology (Affordances)	James J. Gibson	1979	The urban environment provides affordances for action (e.g., stairs afford climbing).	Designing multi-functional spaces that offer diverse affordances for action.
		Environmental Stress	Roger S. Ulrich	1984	Busy and fast-paced urban environments can lead to stress and aggressive behaviors.	Designing therapeutic parks and urban restorative spaces.
		Attention Restoration Theory	Kaplan & Kaplan	1989	Natural environments (e.g., parks) help restore focused attention.	Increasing access to urban green spaces to improve cognitive functioning and reduce mental fatigue.
Behavioral Design Theories	Emphasize using environmental design to guide desirable behaviors.	Behavioral Architecture	John Zeisel	2006	Architecture can be used to reinforce desired behaviors (e.g., productivity or relaxation).	Utilizing natural light and plants in the design of work and residential spaces.
		Nudge Theory	Thaler & Sunstein	2008	Small changes in the environment can alter behaviors without coercion.	Using pedestrian or cycling path markers to encourage desired behaviors.
		Biophilic Design	Stephen R. Kellert	2008	Integrating nature into urban design to improve mental well-being and reduce anxiety.	Designing buildings with green walls and natural spaces to reduce residents' anxiety.

manifested in the urban fabric and data related to it are quantitative, it is usually considered one of the main indicators of fabric inefficiency. The set of physical characteristics of inefficient fabrics mentioned in the literature includes low physical quality, high construction age without historical value in architecture and morphology (Ghanei et al., 2017), lack of proper infrastructure, vulnerability to earthquakes,

and low-density, non-durable building construction (Salimi Rad et al., 2021). Other criteria mentioned are inadequate vehicular access (Rahman et al., 2005), as well as factors such as fine-grained fragmentation, non-compliance with urban planning regulations, visual clutter, and others.

Another dimension addressed is the decline in the functional quality of inefficient fabrics. In the

literature, its characteristics include stagnation and abandonment (Jacobs, 2007), quantitative and qualitative shortage of urban service per capita (Maroofnezhad, 2021), and lack of leisure facilities (Salimi Rad et al., 2021). Economic inefficiency is another dimension often emphasized in other countries. Characteristics include housing for low-income urban groups (Kamanroodi Kajverdi et al., 2021), high unemployment rates (Muriuki et al., 2011), low land value, and lack of incentives for investor entry (Shafiei Sabet et al., 2019).

The socio-cultural dimension is one of the important aspects of inefficient urban fabrics. Due to the general unavailability of required data, it is often not considered in identifying these areas, yet the socio-cultural characteristics of these fabrics are consistently emphasized as one of their defining features. These include the decline of civic life (Wesnawa et al., 2022), erosion of collective memories, decline of event-based urban life and the formation of everyday urban life (Habibi, 2007), poverty and deprivation, insecurity, and other social problems (Salimi Rad et al., 2021), loss of social sense or connections, transactions, and rules related to social capital (Guillermo & Santos, 2011), residence of immigrants and vulnerable social groups (Maroofnezhad, 2021), high population density (Alitajer et al., 2018), residence of ethnic and racial minorities (Kamanroodi Kajverdi et al., 2021), high rates of crime and vandalism, social deprivation and poor housing, poor educational conditions (Pablo & Diego, 2020), degradation of the place's prestige in citizens' minds, and reluctance of individuals to reside in the fabric (Jamini & Dehghani, 2023).

Environmental aspects are usually given little attention in the literature. The set of environmental characteristics mentioned for these fabrics includes high levels of air and water pollution (Salimi Rad et al., 2021) and the presence of workshop and industrial lands (Pablo & Diego, 2020).

Accordingly, the theoretical framework of the research has been developed with the aim of examining the interrelationships between the environmental characteristics of informal settlements, the behavioral

patterns of residents, and the influence of behavioral and environmental psychology theories on improving urban quality of life. This theoretical framework, by expanding existing criteria and components, encompasses multiple dimensions, comprehensively covering physical-spatial, behavioral-psychological, socio-economic, environmental, and governance-policy dimensions, as presented in Table 2.

Research Method

The research method of this study, in terms of its application, is an applied research type. Furthermore, regarding its level and degree of engagement with theoretical and concrete dimensions, this research is of a middle-range type. Additionally, in this study, a combination of quantitative and qualitative methods is used according to the progression of the studies. In fact, part of the phenomena that can be measured numerically are evaluated quantitatively, while others, independent of numerical documentation and reliant on observation and field surveys, are assessed qualitatively. Accordingly, in this study, methods such as descriptive analysis, content analysis, etc., are used as appropriate for each stage of the research.

The case study of this research was conducted in two main sections. First, an analysis based on the research indicators was performed, in which the area was divided into four parts and examined in terms of various criteria such as land use, per capita services, accessibility, spatial quality, and demographic and economic characteristics. Then, using the TOPSIS method, the prioritization of the areas was carried out based on the research indicators and their importance coefficient concerning the establishment of behavioral settlements. In the second part, a spatial configuration analysis was conducted using two methods, Visibility and Axial Map, to evaluate the structural characteristics of the area in terms of spatial integration, connectivity, and natural movement.

The case study of this research is the Mortezagard area on the outskirts of District 19 in Tehran, which was historically a village and has now transformed into an informal settlement. Accordingly, the statistical

Table 2. Theoretical Framework of the Research. Source: Authors.

Component	Criterion	Indicators
Physical-Spatial	Existing Functions	Existing Land Use Per Capita Service Provision Vacant Lands
	Quality of place	Building Quality Age & Historical Value Residents' Satisfaction Level
	Accessibility	Access to Shopping Centers Access to Public Services
Behavioral-Psychological	Urban Landscape	Visual Harmony Presence of Identity-Forming Elements
	Environmental Perception	Legibility Sense of Security Behavioral Compatibility
Socio-Economic	Demographic Characteristics	Population Size Sex Ratio Migration
	Social Capital	Existence of Social Relations & Institutions
	Economic Characteristics	Unemployment Rate Income Level
	Land Economics	Land Value
Environmental	Environmental Health	Air & Water Pollution Waste Management
Governance-Policy	Attention to Regulations	Urban Regulations Community Participation in Decision-Making

population of this study consists of the residents of this area, whose population is approximately 22,273 people based on the latest estimates. Therefore, 378 questionnaires were distributed for sample selection based on Cochran's formula. The questionnaire included questions related to 15 indicators and was distributed in a balanced manner across the four sectors of the area. The responses were collected using a 5-point Likert scale and were loaded into the study's database in Microsoft Excel.

Discussion

As mentioned, in the first phase of the study, Mortezaqard was divided into four areas (Fig. 1), and the evaluation results for these four areas were presented as scores ranging from 1 to 5. The results of this phase indicate that the physical structure and land use in each area have directly impacted the quality and quantity of the residents' essential, optional, and social behavioral patterns. Figs. 2 and 3 illustrate the overall status of land uses and behavioral settings in this area.



Fig. 1. Division of the Mortezaqard Area. Source: Google Earth.

• Area 1 (northwest)

The unique physical composition of this area—comprising dense residential fabric, a diversity of service-oriented land uses along main thoroughfares, and relatively high permeability—has provided an ideal platform for the formation of social interactions and behavioral settings. This is evident in this area's highest scores for the indicators "Frequency and Diversity of Activities" (4.3), "Social Interactions" (4.6), and



Fig. 2. Location of Behavioral Settings in the Area. Source: Authors.

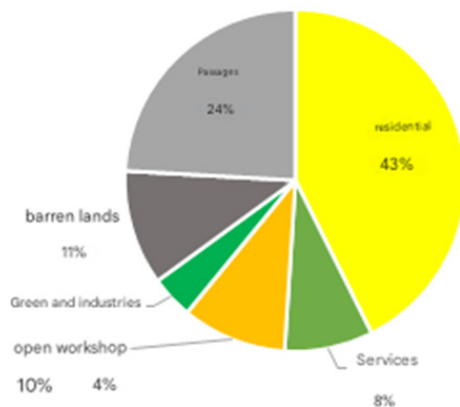


Fig. 3. Existing Land Uses in the Area. Source: Authors.

“Behavioral Compatibility” (4.5). The semi-grid street structure facilitates pedestrian access and enables the formation of dynamic social life at the neighborhood scale. However, a shortage of public open spaces (score 3.4) acts as a physical constraint, reducing the area’s capacity for leisure-oriented behaviors.

• Area 2 (southwest)

The presence of industrial and warehouse land uses on the periphery of this area, coupled with lower residential density, has directly negatively impacted behavioral patterns. A sense of insecurity stemming from proximity to these spaces (score 2.5 for Sense of Security) and poorer access to services has led to a significant decrease in “Sense of Belonging” (score 2) and “Support Networks” (score 1.7). This area demonstrates how inappropriate

land-use mixing (residential-industrial) can weaken social capital and neighborhood bonds. However, this area does contain large-scale open and vacant spaces.

• Area 3 (northeast)

The complete dominance of industrial and warehouse land uses in this area has rendered it a virtually uninhabitable realm for common social behaviors. The lowest scores for “Residents’ Satisfaction” (1.8) and “Access to Services” (1) clearly illustrate this condition. The physical structure of this area, characterized by blocked pathways and functional segregation of spaces, has not only eliminated the possibility for social behaviors but has also restricted behavioral patterns to merely “essential commuting.” This area is a clear example of the destructive impact of industrial activities on spatial structure.

• Area 4 (southeast)

Although this area features high residential density, its irregular street structure with dead-end alleys has challenged both “Permeability” (score 2) and “Legibility” (score 4.4). This has led to heavy reliance on a single main artery. While this has facilitated “Social Interactions” (score 4.3) along this corridor, it has prevented the formation of such interactions deep within the fabric. This finding indicates that high population density alone does not lead to the formation of social behaviors, and the spatial organization of pathways plays a decisive role.

In this section, the reciprocal relationship between physical form and residents’ perception was also examined through questionnaire data, revealing how physical characteristics influence residents’ perceptions and emotions. The results of this questionnaire are presented in Table 3.

The lack of quality public spaces in all areas (with a maximum score of 4 in Area 2, which is due to vacant lands, not designed spaces) is directly correlated with low scores for “sense of place belonging” and “resident satisfaction.” Residents lack places where they can gather, interact, and imbue the place with meaning.

The feeling of insecurity is strongly influenced by the quality of the physical environment. The presence of vacant lands, intrusive industrial land uses, and dead-

Table 3. Questionnaire Results. Source Authors.

Criterion	Score per Area			
	Area 1	Area 2	Area 3	Area 4
Frequency & Diversity of Essential, Optional, and Social Activities	4.3	3.6	4.1	4
Residents' Satisfaction Level	2.3	2	1.8	2.1
Safety & Vulnerability	3.6	3.5	3.3	3.4
Visual Harmony	2.3	2.1	2	2.1
Presence of Identity-Forming Elements	1.8	1	1.2	1
Public Open Spaces	3.4	4	3.5	3.8
Legibility	4.2	3.8	3.5	4.4
Sense of Security	3.8	2.5	3.2	3.9
Behavioral Compatibility	4.5	3.9	3.3	4
Social Interactions	4.6	3.5	4.5	4.3
Sense of Belonging & Place Identity	3.1	2	3.3	1.8
Support Networks	3.2	1.7	3.5	3.3
Urban Regulations	2.5	1.2	2	1.5
Community Participation in Decision-Making	1	1	1	1
Resource Allocation	1.8	1	1.5	1.3

end, dark alleys (particularly in Areas 2 and 4) has contributed to a reduced sense of security, especially at night.

The severe weakness in governance-policy indicators suggests that residents perceive themselves as powerless in shaping the physical structure of their living environment. This sense of powerlessness, in turn, reinforces a behavioral pattern based on passivity and distrust in institutions, which perpetuates the persistence of physical problems.

Therefore, the northwestern area (Area 1), with its dense residential land use and diversity of public services, has the best conditions, while the northeastern area (Area 3), dominated by industrial land use and lacking services, experiences the least favorable conditions. Finally, using the TOPSIS method, the areas were prioritized based on the research indicators and their importance coefficient regarding the establishment of behavioral settlements. Using the TOPSIS technique, the areas were prioritized for the likelihood of forming behavioral settlements as follows: First Priority: Area 2 (highest closeness coefficient to the ideal), Second Priority: Area 1, Third Priority: Area 4, and Fourth Priority: Area 3 (least favorable).

In the second part, the role of the physical-spatial structure was examined with the help of spatial configuration analysis, the results of which are presented in Fig. 4.

Accordingly, the higher integration in the eastern section (10.96 compared to 9.61 in the west) indicates that the spaces in this section have better access to the overall network. This physical characteristic explains why Areas 1 and 4 have better conditions in terms of activity and accessibility indicators. These spaces are naturally located along movement paths and have greater potential to become hubs of activity and interaction.

The significantly higher connectivity in the eastern section (567.6 compared to 246.9) means citizens have more route choices. This finding confirms that the more regular street network in the eastern section provides residents with the opportunity for spatial choice and exploration, which itself fosters the emergence of optional and social behaviors. In contrast, low connectivity in the western section restricts movement to specific routes and reduces the range of spatial behaviors.

After determining the spatial configuration parameters, locations deemed suitable for establishing behavioral settlements based on spatial openness were selected to examine the desired parameters in these urban spaces. This helps identify which spaces hold greater value in terms of integration and generate more movement within the area. The paradoxical and key point of this analysis is that although the eastern section has better macro-scale spatial configuration parameters, a more micro-scale analysis (Axial Map) on specific nodes (Fig. 5) revealed

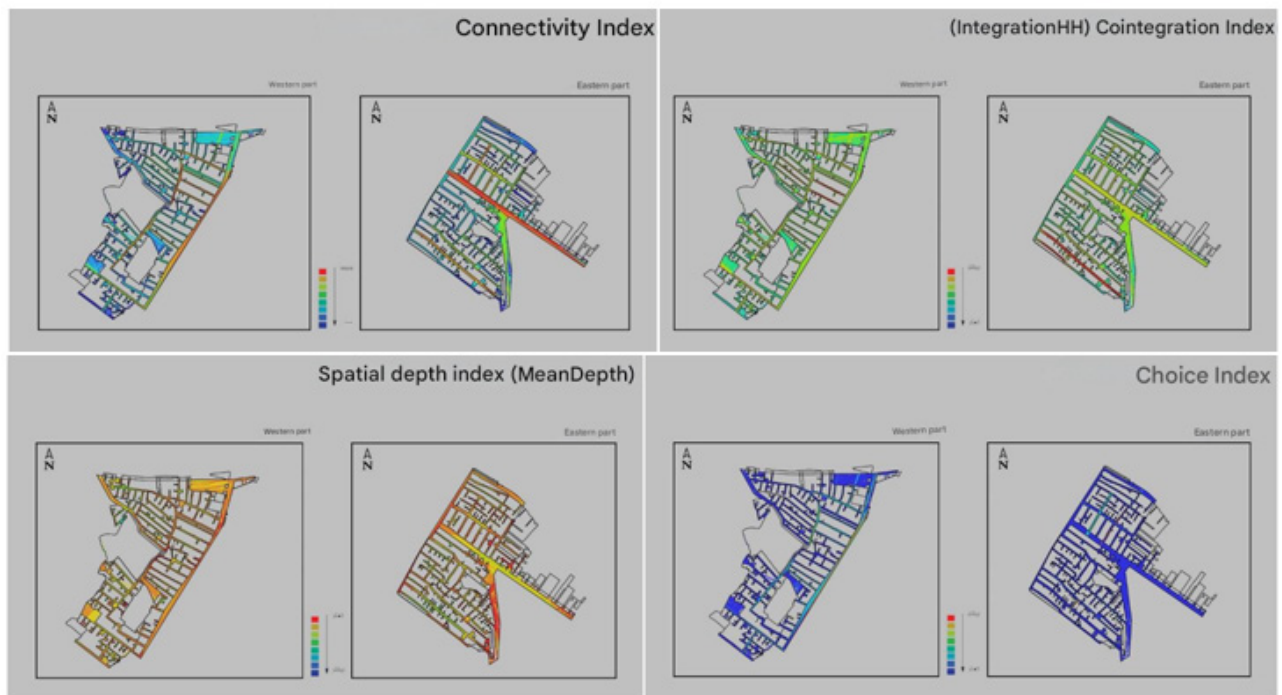


Fig. 4. Results of the Spatial Configuration Analysis. Source: Authors.



Fig. 5. Suitable Locations for Establishing Behavioral Settlements. Source: Authors.

that Space D in the western section is more suitable for establishing a behavioral settlement due to its optimal combination of integration and connectivity. This result warns us that data interpretation should not only occur at the macro level, but finding exceptional points and hidden potentials within a seemingly unfavorable structure is of great importance.

Accordingly, the analyses revealed that objective physical components (such as street network permeability and land-use mix) directly impact functional indicators like movement and access patterns. These physical effects are mediated through the filter of residents' perception

and feelings (such as sense of security, belonging, and satisfaction) and ultimately shape behavioral patterns and the quality of collective life. For instance, the lack of quality public spaces and the presence of intrusive industrial land uses have fueled perceptions of insecurity and powerlessness, limiting the scope of social interactions. The shortage of quality public spaces in all areas (with a maximum score of 4 in Area 2, which stems from vacant lands) is directly correlated with low scores for "sense of place belonging" and "resident satisfaction." Residents lack places where they can gather, interact, and imbue the place with meaning. Simultaneously, the spatial configuration analysis, while confirming the decisive role of macro parameters (such as integration and connectivity) in accessibility and livability, revealed a paradoxical and key finding: identifying points with high behavioral potential within seemingly unfavorable fabrics (like Space D in the western section). This highlights the importance of adopting a perspective beyond macro-data and focusing on "key enabling points." It demonstrates how intelligent, evidence-based interventions at these points can break the vicious cycle of "unfavorable physical environment - negative behavior" and, even in the most unfavorable fabrics, initiate a virtuous cycle by creating spatial capital. Therefore, the research data indicate that the physical-spatial structure is not only a foundation but also

the main determinant of behavioral patterns in the informal settlement of Mortezagard. A coherent, permeable structure with an appropriate land-use mix (like Area 1) provides the necessary platform for the formation of complex social behaviors, rich interactions, and a sense of place belonging. In contrast, a fragmented structure, contaminated with intrusive industries and poor accessibility (like Area 3), reduces behavioral patterns to merely essential, survival-oriented actions and erodes the residents' social capital. This research proves that any intervention aimed at improving behavioral patterns and enhancing the quality of life in such settlements must consider changing and improving the physical-spatial structure as a primary and unavoidable principle.

Therefore, in response to the question of how the physical-spatial structure of informal settlements affects the behavioral patterns of their residents, the findings of this research show that the physical-spatial structure has a determining influence on the behavioral patterns of residents in informal settlements, and this influence operates at both macro and micro levels.

At the macro level, the overall neighborhood structure (street network, land-use mix, dispersion of industries) defines the scope and possibilities for behavior. For example, the presence of industrial land uses adjacent to residential areas (Areas 2 and 3) not only eliminates the possibility for leisure and social behaviors but also imposes avoidance patterns on residents' behavior by creating a sense of insecurity. In contrast, a permeable structure with dispersed services (Area 1) provides the necessary physical foundation for the formation of social interactions, the performance of essential and optional activities, and consequently, the strengthening of social capital.

At the micro level, more fine-grained characteristics such as the presence of open spaces, legibility of paths, and building quality influence the perception, feeling, and quality of these behaviors. The lack of quality public spaces in all areas has led to a weak "sense of place belonging" and reduced "resident satisfaction." In other words, the physical-spatial structure does not merely provide the possibility for a behavior; it also determines the manner and quality of that behavior.

In summary, the answer to the main research question can be stated as follows.

The physical-spatial structure of an informal settlement is the most important factor shaping the behavioral patterns of its residents; such that an unsuitable structure (fragmented, contaminated, inaccessible) reduces behavioral patterns to essential minimums, while a relatively coherent structure (permeable, service-providing, safe) creates the context for the emergence of more complex social behaviors and an enhanced quality of life.

Furthermore, in response to the question of what specific behavioral settings emerge in informal settlements as a result of their physical-spatial structure, the findings indicate that the behavioral settings formed in Mortezagard are largely adaptive responses to the deficiencies of its physical-spatial structure. These specific settings are:

Street-based Settings (Main Thoroughfares):

Due to a severe shortage of concentrated public spaces (such as parks and squares), main streets function as the primary behavioral settings. These streets (mainly in Areas 1 and 4), because of their high accessibility and the presence of retail shops, have become hubs for essential activities (shopping), transient social interactions (informal encounters), and even standing and chatting. These are imposed settings stemming from the lack of dedicated spaces for the congregation.

Spontaneous Settings in Vacant and Marginal Lands:

Vacant and abandoned lands (especially in Areas 2 and 3), which are a product of unplanned structure, are informally appropriated by residents and transformed into settings for activities such as children's play, waste dumping by waste pickers, or even informal gatherings. These settings are generally insecure and detrimental, reflecting a crisis in space management.

In-alley and Dead-end Settings (in Area 4):

The irregular street structure with dead-end alleys, while reducing overall permeability, provides a semi-private, safer space at the micro scale for residents of the same alley. This leads to the formation of stronger neighborhood interactions on a very small scale. These settings often host neighborly chats and children's play in a relatively safe space away from through traffic.

Conclusion

This research was conducted with the aim of investigating the relationship between physical-spatial structure and behavioral patterns in informal settlements. The findings revealed that spatial structure is not a neutral backdrop but an active and driving factor in shaping the social destiny of residents. An inefficient structure, defined by intrusive land uses, poor accessibility, and a lack of public spaces, reduces behavioral patterns to essential actions and reinforces the cycle of spatial-social poverty. In contrast, a relatively coherent structure that incorporates permeability, accessibility, and land-use diversity provides the necessary foundation for the formation of social interactions and the strengthening of social capital.

The innovation of this research lies in integrating quantitative (spatial configuration and TOPSIS) and qualitative methods to provide a deep understanding of the behavior-environment relationship and to offer operational, location-specific strategies. The core doctrine of this research is founded on the principle that “the physical-spatial structure is the most important factor in determining the behavioral and social habits of informal settlements. An inefficient structure reduces behavioral patterns to their minimal and most essential state and reinforces the vicious cycle of poverty, isolation, and despair. Conversely, any improvement in this structure – even on a micro and focused scale – can act as a powerful agent to break this cycle, create the groundwork for the emergence of positive social behaviors, social investment, and increased resident resilience, and steer the path of upgrading these settlements from forced and costly renewal towards gradual, participatory, and human-centric improvement.” Accordingly, the management and upgrading of informal settlements must focus on structural treatment, not merely on treating symptoms. Investing in the improvement of the physical-spatial structure – from street networks and land uses to the quality of public spaces – is a fundamental and essential investment for achieving higher goals such as social justice, urban cohesion, and resilience.

Therefore, intelligent intervention in the physical structure is the most powerful factor for breaking the vicious cycle in informal settlements and guiding them toward sustainability and enhanced quality of life. This intervention must be based on precise intra-neighborhood understanding, respect for the adaptive intelligence of residents, and prioritizing low-cost, high-impact projects.

The finding of this research regarding the positive impact of street network permeability and higher spatial integration on the formation of social interactions is fully aligned with the results of studies such as those by Bill Hillier and his colleagues in Space Syntax theory. These studies also emphasize that spaces located on high-traffic and accessible routes have much greater potential to become social hubs.

Furthermore, the findings of this study regarding the detrimental impact of industrial and warehousing land uses on the sense of security, resident satisfaction, and social cohesion align with those of earlier research. For instance, the study by Paknejad and Latifi (2019) on Tajrish Square demonstrated that behavioral patterns are strongly influenced by land uses, with the type of land use playing a decisive role in shaping social behaviors. Likewise, the research by Rezaei et al. (2016) on the marginalized neighborhoods of Shiraz pointed to an inverse relationship between the expansion of informal settlements and social security. These studies have unequivocally shown that residential proximity to disruptive and incompatible land uses is a primary factor contributing to the decline in quality of life.

In addition, the finding concerning the shortage of high-quality public spaces and its correlation with low levels of “sense of belonging” and “resident satisfaction” is a recurrent theme in most research on informal settlements in Iran. This is similarly reflected in the study by Rezaei et al. (2016), which emphasized the disruption of public presence in urban spaces due to the insecurity resulting from marginalization. This issue constitutes a common structural challenge inherent to such settlements.

As mentioned, many previous studies have either only

analyzed the macro-structure (using space syntax) or focused solely on residents' perception (using questionnaires). The methodological innovation of this research lies in integrating these two methods and applying them on a micro scale. This integration has enabled deeper interpretation and the provision of location-specific solutions. For example, while the macro analysis shows the eastern section has higher integration, the micro-scale analysis identifies point D in the western section as the optimal point for intervention. This "finding the exception within the rule" is a strength of this study.

Also, although the lack of public spaces is a recognized issue, this research specifically explains how residents adaptively respond to this shortage and how they transform main streets into the dominant behavioral setting. This finding provides a more dynamic understanding of the environment-behavior relationship and shows that residents' behavior is not passive but actively adapts to inefficient conditions.

Finally, most existing research provides qualitative descriptions of problems. However, this study, by employing the TOPSIS technique, offers an operational, quantitative output and has ranked the four areas based on a comprehensive set of criteria. This ranking shows where and based on what principles resources should be allocated.

Accordingly, considering that the study was conducted on a case study in Tehran, which is similar to informal settlements around metropolises, it is suggested that the analytical framework of this research (combining space syntax analysis and behavioral mapping) be used as a standard method for accurately diagnosing strengths, weaknesses, and intervention priorities in other informal settlements in Tehran's metropolis and other cities.

Declaration of Competing Interests

The authors declare that they have no conflicts of interest regarding the conduct of this research.

References List

- Alidoost Masouleh, S., & Haghighatbin, M. (2021).

Application of space syntax for the analysis of behavioral settings; case study: neighborhood parks of District 5 of Tehran Municipality. *Naqshejahan - Theoretical Studies and New Technologies in Architecture and Urban Planning*, 11(4), 1-24.

- Alitajer, S., Saadativaghar, P., Robati, M. B., & Heydari, A. (2018). The effect of Spatial Configuration on the Sociability of Informal Settlements: (Case study of Hesar and Dizaj Neighborhoods in Hamedan). *Motaleate Shahri*, 7(26), 57-72. <https://doi.org/10.34785/J011.2018.032>

- Bandura, A. (2016). *Social Learning Theory*. Prentice Hall.

- Barker, R.G (1968). *Ecological Psychology: Concepts and methods for studying the environment of human behavior*. Standfor University Press.

- Faghimavaz, J., Abizadeh, S., Parvizi, R., & Daneshshakib, M. (2021). Designing a liveliness Urban Space with the Approach of Behavioral Setting Improvement (Case Study: Mirabolghasemi St., Rasht). *Urban Planning Knowledge*, 5(1), 47-65. <https://doi.org/10.22124/upk.2020.13801.1243>

- Foroutanrad, F., & Zamani, B. (2022). Evaluation of Behavioral Sites in Urban Squares: A Comparative Study of Naghsh Jahan and Imam Ali Squares in Isfahan. *Geography and Urban Space Development*, 9(1), 127-152. <https://doi.org/20.1001.1.25383531.1401.9.1.8.9>

- Ghanei, M., Esmailpoor, N., & Saraci, M. H. (2017). Evaluating quality of life in neighborhoods in order to improve quality of life (case study: Ghale neighborhood, Bafgh). *Research and Urban Planning*, 8(28), 21-44. https://jupm.marvdasht.iau.ir/article_2333.html?lang=en

- Gibson, J.J. (1979). *The Ecological Approach to Visual Perception*. Psychology Press, Taylor & Francis Group.

- Guillermo, A., & Santos, C. (2011). "Informal settlements need and environmental conservation in Mexico City: An unsolved challenge for land use policy". *Land Use Policy*, 24(8), 662-649.

- Hosseinzadeh Dalir, K., Moosavi, M. S., Bayramzadeh, N., & Pashachini, H. (2021). Investigating the Effect of Urban Space on Citizens' Behavioral Patterns (Case Study: Imam Street, Urmia). *Geography and Urban Space Development*, 9(2), 37-53. <https://doi.org/20.1001.1.25383531.1401.9.2.3.6>

- Habibi, S. M. (2007). *From Shahr to City: An analysis on the concept of the city and its physical form, with an emphasis on the Islamic city*. University of Tehran.

- Jacobs, J. (2007). *The death and life of great American cities* (H. R. Parsa & A. Aflatooni, Trans.). University of Tehran. (Original work published in 2002)

- Jamini, D., & Dehghani, A. (2023). Identifying the most important factors affecting on Population Attraction in peri-urban spaces in Sanandaj city (Case study: Naysar). *Journal*

of Urban Peripheral Development, 5(2), 143-160. <https://doi.org/10.22034/jpusd.2023.386277.1264>

- Jo, H. I., & Jeon, J. Y. (2020). The influence of human behavioral characteristics on soundscape perception in urban parks: Subjective and observational approaches. *Landscape and Urban Planning*, 203, 103890. <https://doi.org/10.1016/j.landurbplan.2020.103890>
- Kamanroodi Kajverdi, M., Karami, T., Zanganeh, A., Hossein Nejad, M. R. (2021). Spatial implications for the development of informal settlements In the metropolitan area of Mashhad. *Research Political Geography Quarterly*, 5(4), 72-90. <https://doi.org/10.22067/pg.v5i4.88152>
- Kaplan, S., & Kaplan, R. (1989). *The Experience of Nature: A Psychological Perspective*. Cambridge University Press.
- Kellert, S. R. (2008). Dimensions, elements, and attributes of biophilic design. In S. R. Kellert, J. Heerwagen, & M. Mador (Eds.), *Biophilic design: The theory, science, and practice of bringing buildings to life* (pp. 3–19). John Wiley & Sons.
- Lang, J. (2009). *Creating architectural theory: The role of the behavioral sciences in environmental design* (A. Einifar, Trans.). University of Tehran Press. (Original work published in 1987)
- Latifi, A., & Sajadzadeh, H. (2014). The evaluation of environmental quality factors on the Behavioral patterns in urban parks- Case study: Mardom park of Hamadan City. *Motaleate Shahri*, 3(11), 3-18. https://urbstudies.uok.ac.ir/article_9563.html?lang=en
- Lewontin, R. C. (2000). *The triple helix: Gene, organism, and environment*. Harvard University Press.
- Lynch, K. & Myer, J.R. (1964). *The View from the Road*. The MIT Press.
- Maroofnezhad, A. (2021). The Performance Evaluation of Quality of Life Indicators(Case Studey: urban Region Two, Mahshahr Port). *Geography and Regional Planning*, 10(41), 922-942. https://www.jgeoqeshm.ir/article_166004.html
- Milgram, S. (1970). The Experience of Living in Cities. *Science*, 167(3924), 1461-1468.
- Mirzabeygi, M., Jalalian, S., Dejdar, O., & Zakerhaghighi, K. (2024). Territorial Behavior of Residents in Marginalized Areas: Analyzing Its Impact on Housing Patterns (Case Study: Banbor, Ban Barz, Sabzi Abad Neighborhoods in Ilam Province). *Preipheral Urban Spaces Development*, 6(1), 41-64. <https://doi.org/10.22034/jpusd.2023.407635.1279>
- Muriuki, G., Seabrook, L., McAlpine, C., Jacobson, C. (2011). Land cover change under unplanned human settlements: A study of the Chyulu Hills squatters, Kenya. *Kenya, Landscape and Urban Planning*, 99(2), 154–165. <https://doi.org/10.1016/j.landurbplan.2010.10.002>
- Pablo A., Diego, G. (2020). The function and credibility of

urban slums: Evidence on informal settlements and affordable housing in Chile, *Cities*, 99. <https://www.sciencedirect.com/science/article/abs/pii/S0264275119303919>

- Paknezhad, N., & Latifi, G. (2019). Explanation and Evaluation the Impact of Environmental Factors on the Formation of Behavioral Patterns in Urban Spaces (From Theory to Practice: Study of Tajrish Square). *The Monthly Scientific Journal of Bagh-e Nazar*, 15(69), 51-66. <https://doi.org/10.22034/bagh.2019.82313>
- Paknezhad, N., Latifi, G. (2019). Explanation and Evaluation the Impact of Environmental Factors on the Formation of Behavioral Patterns in Urban Spaces (From Theory to Practice: Study of Tajrish Square). *The Monthly Scientific Journal of Bagh-e Nazar*, 15(69), 51-66. <https://doi.org/10.22034/bagh.2019.82313>
- Rahman, T. & Mittelhammer, R. C. & Wandschneider, P. (2005). Measuring the Quality of Life across Countries: A Sensitivity Analysis of Well-being Indice” s. Wider Internasional Conference on Inequality. *Poverty and Human wellbeing*. May 30-31, Helsinki, Finland
- Rezaei, M., Balaghi, R., Shamsoddini, A., Shaer, F., & Mandani, S. (2016). Evaluation and analysis of social dimensions of marginalization in metropolises (Case study: Marginalized neighborhoods of Shiraz city). *Territory Geography Quarterly*, 13(52), 57–75.
- Rokhsari, H., Jafari Mehrabadi, M., & Hataminejad, H. (2019). Mental Mapping of the First-material Urban Space, A Comparative Study of the Residents of Formal and Informal Settlements in the City of Rasht. *Research in the Geography of Urban Planning*, 7(1), 83-110. <https://doi.org/10.22059/jurbangeo.2019.263072.950>
- Salimi Rad, S., Karimiyan Bostany, M., & Anvari, M. R. (2021). Evaluation and analysis of quality of life Dimension in urban Region (Case study: Zahedan city). *Geography and Regional Planning*, 11(45), 255-267. <https://doi.org/10.22034/jgeoq.2021.141786>
- Sarbandi Farahani, M., Bahzadfar, M., Abbaszadegan, M., & Alvandipour, N. (2014). Environmental qualities on behavior settings in local green and open Spaces. *Urban Structure and Function Studies*, 2(5), 101-115. https://shahr.journals.umz.ac.ir/article_897.html?lang=en
- Shafiei Sabet, N., Ayoubi, M., & Fadaei Bashi, A. (2019). Studying the Consequences of Urban Sprawl in Rural Peripheral Settlements (Case study: Southern villages of Tehran metropolis). *Ranian Journal of Remote Sensing and GIS*, 11(2), 1-20. <https://doi.org/10.52547/gisj.11.2.1>
- Skinner, B. F. (1938). *The behavior of organisms: An experimental analysis*. Appleton-Century-Crofts.

- Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: Improving decisions about health, wealth, and happiness*. Yale University Press.
- Theil, H. (1962). Three-Stage Least Squares: Simultaneous Estimation of Simultaneous Equations. *Econometrica*, 30(1), 54-78. <https://doi.org/10.2307/1911287>
- Ulrich, R. S. (1984). View through a window may influence recovery from surgery. *Science*, 224(4647), 420-421. <https://doi.org/10.1126/science.6143402>
- United Nations Human Settlements Programme. (2015). UN-Habitat global activities report 2015. <https://unhabitat.org/fr/taxonomy/term/719?page=0>
- Vidal, D. G., Teixeira, C. P., Fernandes, C. O., Olszewska-Guizzo, A., Dias, R. C., Vilaça, H., & Barros, N. (2022). The impact of the COVID-19 pandemic on the use and perception of urban green spaces in Porto, Portugal. *Wellbeing, Space and Society*, 3, 100105. <https://doi.org/10.1016/j.wss.2022.100105>
- Esnawa, I. G. A., Sarmita, I. M., & Christiawan, P. I. (2023). Migrant livelihood challenges in peri-urban area. In *Proceedings of the 4th International Conference on Law, Social Sciences, and Education (ICLSSE 2022)*, 28 October 2022, Singaraja, Bali, Indonesia. EAI. <https://doi.org/10.4108/eai.28-10-2022.2326346>
- Yanlong, G., Xuemei J., Linfu, Z., Han, Z., & Zuoqing J. (2022). Effects of Sound Source Landscape in Urban Forest Park on Alleviating Mental Stress of Visitors: Evidence from Huolu Mountain Forest Park, Guangzhou. *Sustainability*, 14(22), 1-22. <https://doi.org/10.3390/su142215125>
- Yen, Y., Wang, Z., Shi, Y., Xu, F., Soeung, B., Sohail, M. T., Rubakula, G., & Juma, S. A. (2017). The predictors of the behavioral intention to the use of urban green spaces: The perspectives of young residents in Phnom Penh, Cambodia. *Habitat International*, 64, 98–108. <https://doi.org/10.1016/j.habitatint.2017.04.009>
- Zeisel, J. (2006). *Inquiry by Design*. WW Norton & Company.

COPYRIGHTS

Copyright for this article is retained by the author(s), with publication rights granted to the Bagh-e Nazar Journal. This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/>).



HOW TO CITE THIS ARTICLE

Fatahi, R., Khatibi, M. R., & Bigdeli Rad, V. (2026). Analysis of the Correlation Between Physical-Spatial Structure and Behavioral Patterns of Residents in Informal Settlements (A Case Study of the Morteza Gerd Neighborhood, District 19, Tehran). *Bagh-e Nazar*, 23(158), 29-44.

DOI: [10.22034/bagh.2026.549875.5909](https://doi.org/10.22034/bagh.2026.549875.5909)

URL: https://www.bagh-sj.com/article_243690.html?lang=en

