

ORIGINAL RESEARCH PAPER

## Toward behavior-based placemaking: the evolution of place concept in urban design knowledge

A.R. Sadeghi<sup>1,\*</sup>, F. Shahvaran<sup>1</sup>, A.R. Gholami<sup>1</sup>, T. Feyzabi<sup>2</sup>

<sup>1</sup> Department of Urban Planning & Design, Faculty of Art and Architecture, Shiraz University, Shiraz, Iran

<sup>2</sup> School of Planning, Department of Architecture & Planning, Dalhousie University, Halifax, Nova Scotia, Canada

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### ABSTRACT

**BACKGROUND AND OBJECTIVES:** The concept of place as a multidimensional approach in the evolution of urban design concepts has always sought to improve the quality of urban environments and spaces. "Place" results from humans' environmental experiences and cognition of space which is perceived through meaning in people's minds within the interaction of humans and place. Placemaking is considered a participatory process and a practical approach for urban designers, which can be implemented by improving the physical quality of urban spaces. In urban design studies, several perspectives have been proposed regarding the structure of the place model. This paper aimed to examine the evolution of placemaking in urban design theories to propose a place model based on behavior. How and in what way behavior can contribute to the formation of place is the primary question of this research. In other words, what is the role of behaviors analysis and behavioral patterns in the formation of an urban place?

**METHODS:** Descriptive-analytical method is used to review the concept of place and its conceptual evolution to provide placemaking recommendations and suggestions based on the proposed place model. In the case study section, Studies have been done using behavioral observation tools such as place-based graphic maps, movement path tracing of individuals, and recording various behavioral patterns by time intervals at the Hafezieh intersection, Shiraz, Iran.

**FINDINGS:** The results of analyzing behavioral maps of Hafezieh intersection and recommendations from global experiences regarding public life and behavioral studies revealed that the combination of four aspects of form, function, meaning, and ecosystem with emphasis on the specific role of behavioral studies could lead to flourishing placemaking.

**CONCLUSION:** Paying attention to the role of behavior-based placemaking in recent urban thoughts can promote sustainable urban design and determine optimal policies for social interactions, communication, and the importance of human behaviors that define a thriving place and support its constant progress

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\*Corresponding Author:

Email: [arsadeghi@shirazu.ac.ir](mailto:arsadeghi@shirazu.ac.ir)

Phone: + 987136131070

ORCID: [0000-0002-0047-7533](https://orcid.org/0000-0002-0047-7533)

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## INTRODUCTION

As the setting for human interactions, cities not only include buildings; instead, it is the space between the buildings, pathways, filling elements, open spaces, and citizens' active presence which help create urban existence. Serving as a ground where public activities of urban life occur, urban spaces should provide participation, comfort, entertainment, reciprocal communication, and frequency of citizens. Urban space design involves public life, walkability, active, dynamic, and vital settings which need to be focused attention by urban experts, architects, and designers (Carmona et al., 2003). Urban space is a product of historical and socio-cultural forces of the community, which is more characterized by variable space elements such as activities system and more stable space factors, including the civil capacity of the urban community, than technological, geographical, and physical factors. On the other hand, these socio-cultural forces have created these elements through such elements as institution systems and urbanization dynamism mediated by social groups and their activities (Parsi, 2001). Urban space is a product of historical and socio-cultural forces of the community, which is more characterized by variable space elements such as activities system and more stable space factors, including the civil capacity of the urban community, than technological, geographical, and physical factors. On the other hand, these socio-cultural forces have created these elements through such elements as institution systems and urbanization dynamism mediated by social groups and their activities (Parsi, 2001). Urban space is a significant factor involved in the occurrence of activities and behaviors. These spaces provide opportunities that support human activities or create a barrier that prevents activities and behaviors in space (Nassar, 2005). However, many contemporary urban spaces are not based on behavioral-activity patterns of space users; therefore, urban designers' familiarity with behavioral sciences and social dimension studies to design considering users' cultural needs could create desirable conditions for urban space users. This multifaceted concept involves both the physical and social environments. Simply put, the place combines human activities, roles, and relations. People give meaning to place based on their experiences, social ties, emotions, and thoughts within a physical platform (Lak and Jalalian, 2017). Place is a part of the

space personalized by human presence; i.e., when the relation between man and space is based on a previous experience, the space turns into a place. This relation denotes that place is part of the environment experience and convergent cognitions (Pretty et al., 2003). On the other hand, place denotes the same meaningful space, part of the space characterized by social interaction (Harrison and Dourish, 1996). The primary concerns of urban designs are to promote the quality of urban spaces to increase desirable placemaking in cities; thus, to design desirable and high-quality places where citizens deal with life, labor, and daily activities, it is required to examine socio-behavioral dimensions of urban design. Most research conducted in placemaking areas has concentrated on the physical, functional, and environmental aspects of the place; However, place is formed by a combination of an environment and behavior and is rarely seen as a behavioral setting. This study emphasizes behavioral-activity studies related to placemaking. This study aims to answer the following questions by reviewing the concept of place, the evolution of placemaking in urban design theories and perspectives, and investigating global experiences concerning public life and behavioral studies. This study was applied in terms of nature and content. It sought to examine experts' views and provide a place model based on behavior through a descriptive-analytical approach. It also aimed to explain urban design concepts and public urban spaces and placemaking and behavioral studies using documentary and library studies. It also studies case studies and global cases to devise guidelines on placemaking based on the proposed model.

### *Literature Review*

The placemaking approach focuses on people's experience in space and turning it into a place to meet basic human needs (Project for Public Spaces, 2016), which fundamentally is defined as four features of sociability, uses and activities, access and access linkage, and comfort and image. Wyckoff (2014), in the research of "Definition of Placemaking: Four Different Types," has defined placemaking as a people-centred approach to planning, designing and managing public spaces in cities; due to its emphasis on the relationships between individuals, communities and urban spaces. The research also mentions three types of strategic, participatory and tactical places.

In [Nouri and Costa's \(2017\)](#) study of "Placemaking and climate change adaptation: new qualitative and quantitative considerations for the Place Diagram," placemaking is considered ecologically relevant in terms of adaptation to climate change. In addition, [Gulsrud et al., \(2018\)](#) used the term "green placemaking" concerning place and nature in the study "Innovative urban forestry governance in Melbourne, investigating green placemaking as a nature-based solution." This shows that placemaking must recognize the value of ecological systems and consider the ecological aspect and other physical, functional and semantic aspects. Furthermore, [Ellery and Ellery \(2019\)](#) laid emphasis on the importance of physical, cultural and social aspects in creating a place; including; promoting public interaction, mass communication, community health and safety, social justice, economic development and environmental sustainability, in the study "Strengthening Community Sense of Place through Placemaking." According to the study "Placemaking in action: factors that support or obstruct the development of urban community gardens," [Wesener et al., \(2020\)](#) also describe four semantic dimensions (individual and collective), social exchange, social action (participatory), and empowerment in the formation of a prosperous place. [Ghavampour and Brenda Vale \(2019\)](#), in the study "Revisiting the Model of Place: A Comparative Study of Placemaking and Sustainability," believes that placemaking is the evolution and combination of visual-artistic and social traditions. Visual-artistic focuses on visual forms, and the social function emphasizes the use and experience of individuals in a place. Regarding the socio-behavioral aspect, [Hamzeieha and Tabibiban \(2017\)](#), in the study "Redesign of urban spaces with an emphasis on the relationship between the physical environment of the city and the behavior of citizens," illustrated that the potential of urban places is used to meet the needs of citizens and improve their behavioral pattern. In the study "Engaging youth in placemaking: modified behavior mapping," [Little \(2020\)](#), by examining the behaviors and using the modified behavior mapping technique, showed that individual and collective participation in the design of inclusive places is crucial. According to the reviewed literature, it is noteworthy that placemaking is a process with the aim of improving the quality of urban spaces along with the active participation of citizens in the

creation of the place. Therefore, by emphasizing the components of place structure (form, activity, meaning, and ecosystem), considering the socio-behavioral aspect is essential.

#### *Urban design and public urban space*

Urban design is the art of making places for people. It includes the way places work and matters such as community safety and how they look. It concerns the connections between people and places, movement and urban form, nature and the built fabric, and the processes for ensuring prosperous villages, towns, and cities. Good design can help create lively places with distinctive character; streets and public spaces that are safe, accessible, pleasant to use, and human in scale; and places that inspire because of the imagination and sensitivity of their designers ([The Regions et al., 2000](#)). Public space or place is referred to a part of the physical environment related to public functions. On the other hand, the public realm has a broader concept involving all places, people, activities, and social life aspects. Thus, public space and public realm are not synonymous, as the former refers to a part of the public realm ([Madanipour, 2007](#)). An open public space provides motivation and free selection of behaviors, movements, and visual explorations for many people in the city. In other words, it is a flexible space that easily adapts to a variety of behaviors and lays a neutral, albeit inducing, the groundwork for human actions ([Lynch, 1972](#)). In the meantime, one would say that public realms are the essential parts of the cities and urban environments. In such realms, most contacts are characterized by human interaction. These realms involve all urban parts where people interact physically and visually ([Tibbalds, 1992](#)). This environment serves as a place to get the social life moving as it lays the groundwork for citizens' interactions. [Rapaport \(1988\)](#) argues that urban space as a public realm involves collective behaviors that significantly regulate peoples' lives and give meaning to the urban spaces as a whole. One would say that an urban space does not have a spatial and physical dimension; instead, it is the community and people who link together in various levels of the space. Urban spaces refer to a scene where public activities occur. The streets, squares, and parks of a city form human activities. These dynamic spaces form the main parts of a city as they stand against fixed and immobile spaces ([Bahrainy, 2013](#)). Therefore, Urban spaces are

part of cities’ open and public spaces, demonstrating public life’s nature, where citizens are present. It is a space that allows people to access it and engage in activities there. A public institution should administer this space to meet the public needs (Pakzad, 2013). In other words, these spaces serve as places where most actions and communications occur and are the primary elements that create social links between citizens and collective memories (Lotfi et al., 2013). Thus, as the groundwork of social interactions and main urban elements, urban spaces turn into places by meaning.

*Placemaking and its structure*

Nurberg Schulz (1980) considers space to be different from place and believes that spaces derive their existence from places, not space per se. It is also believed that the spiritual condition of man helps to understand the environment in which he is present. Places are based on directly experienced phenomena rich in meanings with natural objects and continual activities serving as a significant individual and social identity sources (Relph, 1976). On the other hand, Tuan believes that the concept of place relates to the mind, arguing that the emotional attachment process and meaning and value determination are critical to changing the space to the place; in other words, better cognition and giving value to space helps to make a place (Tuan, 1977). The concept of place refers to social structures which involve experiences of sociability, physical forms, and mixed processes. Since the 70s, theorists have been developing various perspectives on the structure of places. Most views involve three main aspects of the environment form, function, and meaning, which construct the place structure (Scannell and Gifford, 2010). Table 1 shows the place structure based on theorists’ views.

The placemaking approach is a permanent participatory process whose users define its identity

and meaning (Horgan, 2020). This idea was raised in the 1960s and 1970s, aiming to focus on visual and audio elements to meet the needs of people in urban environments in terms of urban planning and design (Placemaking-booklet, 2016). Placemaking has practically been founded on ideas proposed by experts since the 60s. From the beginning of the 60s, the concept of the place appeared in theories proposed by Lynch (1960) and Jacobs (1961). In the 70s (when urban designers put their interest in the relation between people and place concepts), such theorists as Relph (1976), Norberg-Schulz (1980), and Canter (1977) proposed concepts regarding the place and spatial models, while in the 80s, Proshansky et al. (1983), Jacobs and Appleyard (1987) and Buchanan (1988), eventually in the 90s, Tibbalds (1992), Montgomery (1998), Gustafson (2001), Carmona et al. (2003) and Gehl (2011) stated various views concerning placemaking. In this regard, as a non-profit organization, the Project for Public Spaces has been working to encourage placemaking since 1975. The fundamental goal of this organization was to encourage people to participate in public spaces and strengthen their links with these spaces. With the purpose of placemaking following the citizen’s views, Project for Public Spaces (PPS) studies and implements projects in their living environments. Table 2 summarizes the history of placemaking.

People are place makers; nevertheless, designers create this occurrence and its spatial structure. Accordingly, regarding design quality and placemaking, one should point out that places are designed and built concerning their function and activities. In this vein, place features make place components meaningful. Urban design aims at placemaking. Thus, physical, functional, and meaningful qualities are interrelated and urban designers can succeed in making places by taking advantage of these three types of qualities (Carmona et al., 2003).

Table 1: Theorists perspectives in terms of multidimensional structure of the place

Theorist	Place: Multidimensional concept		
	Physical Dimension	Functional Dimension	Perceptual Dimension
(Gustafson, 2001)	Form	Function	Meaning
(Montgomery, 1998)	Form	Activity	Imagination
(Trancik, 1986)	Physical Space	Environmental Features	Meaning
(Norberg-Schulz, 1980)	Perceived Space	Character	Meaning and Memory
(Canter, 1977)	Form	Activity	Imagination
(Relph, 1976)	Form	Activity	Meaning

*Placemaking in terms of behavior*

Although scholars and theorists have referred to place in their theories, aesthetic aspects of the place concept, along with the behavioral conditions of space users, had remarkable effects on the diversity of activities as the main factors in making thriving urban spaces and places were introduced as unique urban spaces with distinctive identities. The way an activity is done is called behavior. Human behavior is the outcome of his motives and needs, environmental capabilities, the individual’s image of the world outside originating from his perception, and the meaning of this image. Thus, any activity affected by the above conditions can take on many forms and result in different behaviors. For instance, sitting on a bench, squatting, and lying down are sitting-related behaviors. Behavior is not a follower of activity alone; instead, it is a combination of activity, time, and place, involving such requirements as various doable activities, a particular part of the environment commensurate with the behavior, the establishment of proper relation about the above case in a specific period (Pakzad, 2014). Consequently, behavior is directed through an individual’s views of the social environment and built environment (Hamzeiha and Tabibian, 2017). Users of urban spaces attend to the spaces based on their needs and expose different behavioral patterns. Thereupon, behavior is directed through an individual’s views of the social

environment and built environment (Hamzeiha and Tabibian, 2017). Nowadays, urban spaces have already lost their vitality and attractiveness, and citizens attend less to such spaces. Furthermore, to design consciously in a better way, one should be informed of urban space users’ differences. These groups can vary depending on their age, gender, and the goals set for their activities. Thus, they demonstrate an activity pattern that is also different. Another thing to note regarding attaching value to behavioral-activity patterns is paying attention to equipment and amenities in urban space provided for space users. Urban spaces can create conditions that attract citizens or, conversely, reduce people’s participation. Hence, urban designers need to promote the quality of urban spaces by being aware of the situation of these spaces and effective criteria for enhancing them (Sadeghi et al., 2021). Table 3 summarizes theorists’ views on the occurrence of activities and behavioral studies in urban spaces.

*Global experiences of behavioral studies*

Over time, attention to the social dimension in urban design has gained much consideration, and behavioral studies in urban design have assumed more importance. Gehl’s architectural group and design team have conducted studies on behavioral patterns by emphasizing public life and focused on several cities across the world, including Wellington (New

Table 2: Placemaking Background

Theorist	Decade	Point of View
PPS (1975-present)	2000	Emphasis on the role of comfort and image, accesses and linkages, activities and uses, and sociability with determining quantitative and qualitative criteria
Gehl (2011)		Behavioral and public life studies and their roles in place attractiveness
Carmona et al. (2003)		Understanding six-fold components affecting the quality of urban places
Montgomery (1998)	1990	Place success depends on the type of space activity simultaneously with form and meaning
Tibbalds (1992)		Attention to the principle of totality in urban placemaking
Buchanan (1988)		Urban design is based on making places emphasizing the occurrence of events
Jacobs and Appleyard (1987)	1980	Significance of public places in proportion to human needs
Proshansky et al. (1983)		The significance of a balanced relationship between an individual’s identity and place features
Norberg-Schulz (1980)		“Place” is a qualitative concept; space is the three-dimensional structure of the place, and character is the public feature of the place
Canter (1977)	1970	Place structure is a mixture of activities, value-related concepts, and physical environment that affects human experiences.
Relph (1976)		Place concept as three characteristics of the form, activity, and meaning; Components of human experience
Jacobs (1961)		1960
Lynch (1960)	“Place” is unique with identity	

Table 3: Behavioral observation methodology

	Activity patterns		Technique
	Behavior-based placemaking	Dynamic activity	Tracing
	Static activity	Activity diversity	Record behavioral setting Use intervals of 5 to 15 minutes Activity type notes



Fig. 1: Projects Study Areas from left to right (Wellington, London, Adelaide, Seattle, and Christchurch), (Gehl,2002;2004; 2009)

Zealand, Australia), London (England, UK), Adelaide (South Australia, Australia), Seattle (Washington, US) and Christ Church (New Zealand, Australia) (Fig. 1). In this vein, the researchers have examined global experiences and provided solutions to behavior-based placemaking. As pioneers of behavioral studies, Gehl’s design team emphasized public life in the mentioned five projects and initially described the project structure briefly. Then, to describe the studies in each project, they explained the macro-objectives, the procedure, and a brief introduction of the area under study. In the second section, the project analysis has included an analytical examination of studies related to activities and behaviors, including the pedestrian flow (density and people flow rate), networks and transportation modes (such as walkability and cycling), urban spaces (sitting places, urban furniture, behavioral settings, types of activities by time and place, social interactions of space users) and urban space users (gender and age groups). The analysis and understanding section for each subject stated included mapping and diagrams. In the end, each project proposed recommendations in various physical, functional, meaningful, and environmental dimensions (Gehl, 2002, 2004, 2009).

Regarding form and physical aspects, all the projects were mainly focused on permeability, physical accessibility, entry type into the spaces, and transportation moods. In this connection, proposed

suggestions and recommendations have frequently concentrated the entry types into the space, designing the entries, paths types, and connection networks. The following tables explain these recommendations. Earlier, the interaction of function-activity and meaning-imagination in an urban place was discussed. The behaviors and activities of people in space were considered the focal point of the interaction of function-activity and meaning-imagination. The understanding and analysis section considered behavioral discussions, pedestrian volume and traffic, types of activities, behavioral setting, and other related topics (sometimes by time). In this connection, maps have been provided for each case. From an ecosystem perspective, which has recently received more attention in urban design, projects have sought to deal with humans’ climatic and biological well-being. The proposed recommendations concentrate on urban furniture and its type, canopies and shading, weather conditions, and green spaces. Due to the proposed models of place, it became apparent that combining three aspects of form, function, and meaning can lead to placemaking. Recently, much consideration has been given to environmental and ecological subjects in urban design. On the one hand, physical-environmental factors such as permeability, accessibility, enclosure, formal and physical symmetry; socio-functional factors such as sociability, flexibility,

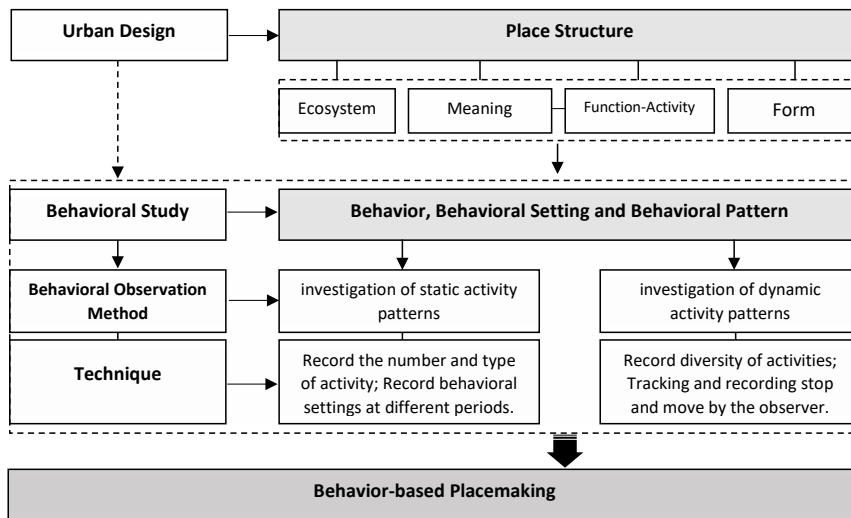


Fig. 2: Proposed Behavior-based Placemaking Model

inclusiveness, vitality, being participative, diversity of land use and activities, and meaningful factors such as legibility, visual attractiveness, imageability, sense of place, and identity also contribute to a successful placemaking (Jacobs, 1961; Lynch, 1981; Montgomery, 2003; Carmona *et al.*, 2003; The Regions *et al.*, 2000; Bentley *et al.*, 2013). Meanwhile, the authors reviewed relevant behavioral studies. They found that various environmental, functional, physical-environmental, perceptual-behavioral, and socio-cultural factors could affect citizens' behavior and behavioral pattern. Such indicators as mobility, permeability, accessibility, climatic comfort, natural elements and landscapes, vitality, diversity of land use and activity, visual attractiveness, inclusiveness, timing, social interaction, and flexibility were also defined concerning these factors (Shole *et al.*, 2017; Alighanbari and Nasr, 2016; Gehl and Svarre, 2015; Baqbeh *et al.*, 2014; Tavassoli and Fathi, 2013; ZolfiGol and KarimiMoshaver, 2019; Lotfi *et al.*, 2014; Paknejad and Latifi, 2019; Sadeghi *et al.*, 2021). The authors used dimensions and indicators affecting successful urban placemaking. They discussed the main factors affecting the behavioral patterns of users of urban spaces to propose a place model by emphasizing behavioral-environmental components. In this model, form, function, activity, meaning, and ecosystem were considered based on the structural aspects of the proposed place model (Fig. 2). It is noteworthy that all aspects of place, affect behavior and behavioral patterns. Furthermore,

the environmental-behavioral components of related studies can affect the behavioral patterns of users who use the places, including the urban spaces. Table 3 describes behavioral observation method based on the proposed place model.

The primary concern of urban design is to improve the quality of urban environments and public realms. Meanwhile, as the essential component of the city's structure, urban spaces, and public realms should boost the presence of citizens and meet their demands. Furthermore, as the users of such spaces, citizens behave differently in urban spaces while meeting their needs. Hence, designing urban spaces that fulfill the needs of citizens based on their behaviors and behavior patterns might be helpful in urban studies from a social-psychological perspective. The current study have been carried out in Shiraz/ Iran in 2022.

## MATERIALS AND METHODS

### Research Process

In terms of nature and content, this study is among the applied researches in exploring theorists' views, describing the model of behavior-based place derived from the available literature, and examining global experiences with a descriptive-analytical method. In this study, the concepts of urban design, urban public space, placemaking, and behavioral studies are explained in the literature review. The case study has also been evaluated and analyzed utilizing the

behavioral observation technique. Finally, based on the case study recommendations and suggestions for behavior-based placemaking are expressed. Fig. 3 shows the research process.

In the case study section, studies have been done using behavioral observation tools such as place-based graphic maps, tracking the movement path of individuals, and recording various behavioral patterns by time intervals. Hafeziyeh intersection space is located in zone three according to the Municipality of Shiraz County, Iran (Fig. 4).

This area hosts several historic and valuable places, such as the Fars Department of Culture and Islamic Guidance, Hafez Auditorium, Hafeziyeh (Tomb of Hafez), Shiraz Art University, Hafeziyeh Stadium entrance, Shiraz National Garden. Hafeziyeh walkway consists of a pedestrian pathway (the Northern section) and a vehicular pathway (the Southern section). In addition, the National Library and Archives of Iran, and Military zone are located in the street, interrupting the Hafeziyeh Walkway. Therefore, the case study area is

located on an important historical site (Fig. 5). Over time, attention to the social dimension in urban design has gained much consideration, and behavioral studies in urban design have assumed more importance. Gehl's architectural group and design team have conducted studies on behavioral patterns by emphasizing public life and focused on several cities across the world, including Wellington (New Zealand, Australia), London (England, UK), Adelaide (South Australia, Australia), Seattle (Washington, US) and Christ Church (New Zealand, Australia). In this vein, they have examined global experiences and provided solutions to behavior-based placemaking.

## RESULTS AND DISCUSSION

### Behavioral maps analysis

In the urban space analysis section using behavioral maps, the behavioral maps were prepared as static and dynamic activity patterns (derived from the proposed location model) in three-time intervals within a workday: morning, noon, and night.

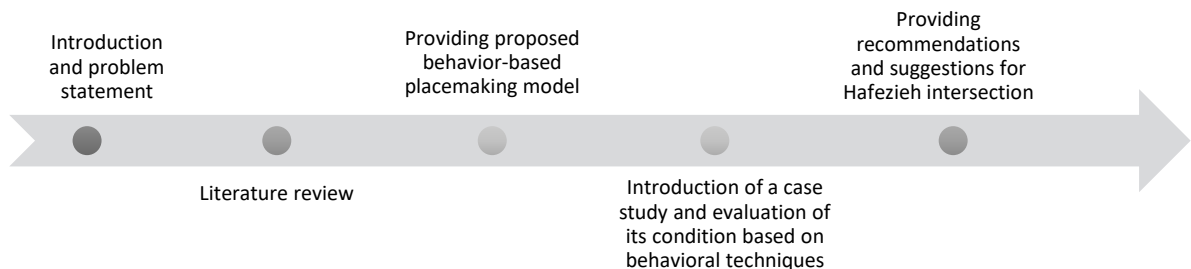


Fig. 3: Research Process

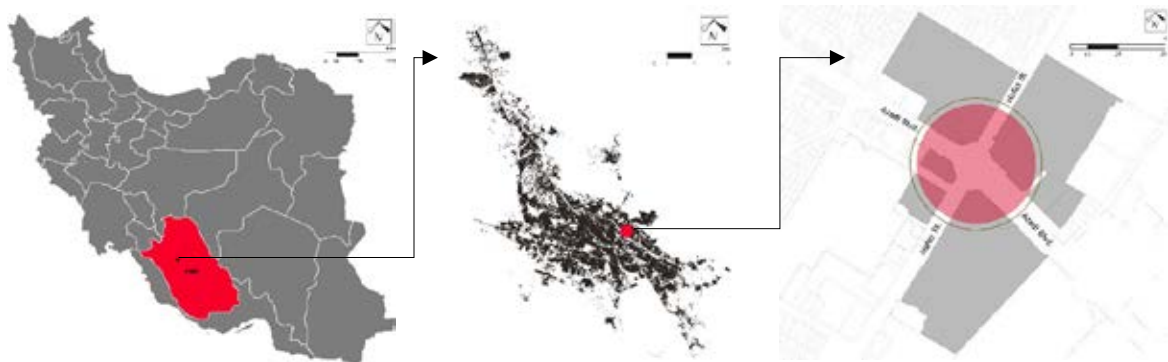


Fig. 4: Hafeziyeh intersection location within Shiraz; source: authors: a) Iran map, b) Shiraz city in Fars, Iran and c) Case study location



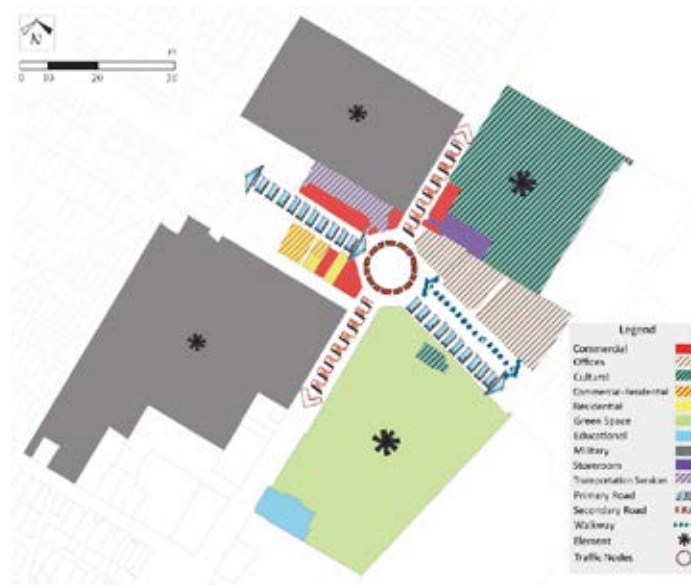


Fig. 5: Cognitive map of Hafeziyeh intersection; source: authors

#### *Static activity pattern (activity diversity)*

The location of various occurred activities was examined during the rush hours of the day in the morning, noon, and night (Figs. 6 to 8). Activities were categorized based on the concepts derived from the reviewed literature. The main activities of walking, standing and sitting fall into three categories depending on the goal of each activity. The analyzed data shows that walking activity in the Hafeziyeh Walkway and close-by sidewalks mainly occurred during the daytime (morning and noon), and the maximum was at noon. These results indicated the importance of providing shades for walking in warm and moderate climates. Activities of standing and sitting more frequently have happened in front of commercial and cultural uses and places provided with urban furniture. The analysis implies that the behavioral settings are forming more intensely in the active frontages with the commercial, cultural, and green space uses. Hence, the results show the importance of creating active frontages in designing urban spaces and avoiding dead or lazy frontages, especially at night.

#### *Dynamic activity pattern (tracing)*

The movement patterns of users have been studied using tracing over time, which studies the

users' movement patterns over time. The tracing study was carried out by being present in the space within a week and recording the users' movements three times per day in 15-minutes increments every hour, as shown in Figs. 9 to 11. The resulting drawn routes indicate that the pedestrian traffic does not follow any specific pattern. Due to the increase in the number of users during the night, pedestrian walking patterns are more diverse and busier. Pedestrians have preferred to commute through Hafeziyeh Walkway more frequently than the other sidewalks. Thus, designing sidewalks as safe and attractive paths could convert a space into a place.

Studies on urban design knowledge show that most urban design theories have been initially limited to formal and aesthetic aspects. Then it focuses on social dimensions and public perception, and finally, place and placemaking. Placemaking is achieved by designing a meaningful urban space combined with the continuous presence of space users and their social interactions. The presence of humans in urban spaces and their social interactions could pave the way for various activities in urban spaces. Ultimately, after reviewing the recommendations of the global experience and findings and analyses of behavioral studies in the case study, the authors have proposed recommendations regarding behavior-

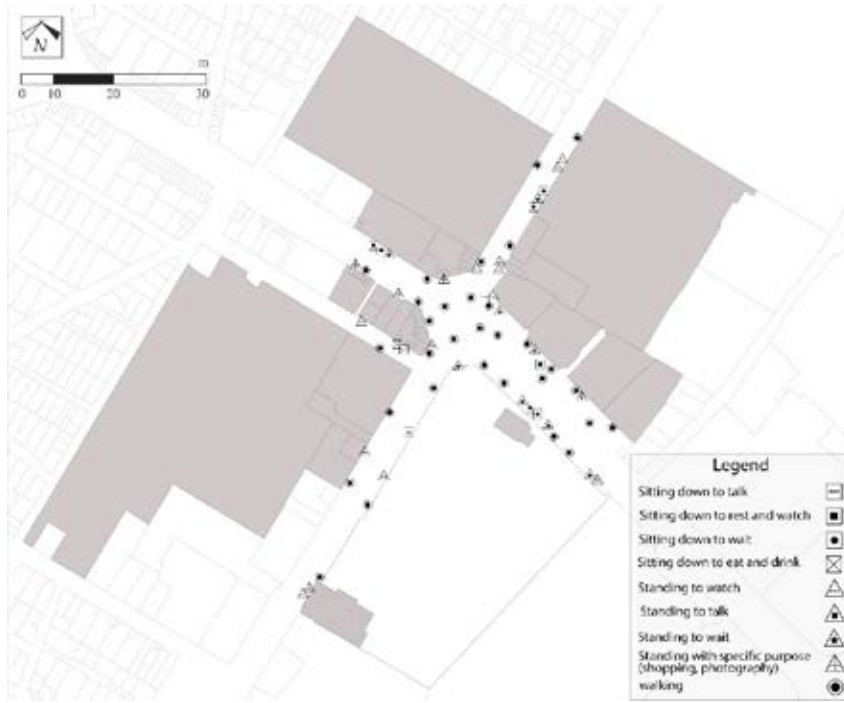


Fig. 6: Locations and types of activities (morning); source: authors

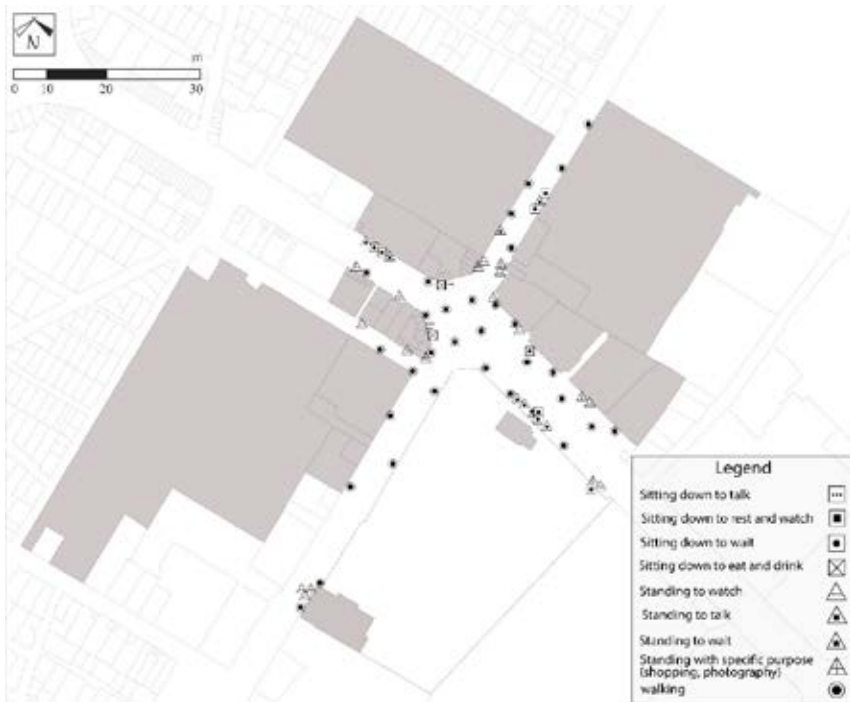


Fig. 7: Locations and types of activities (noon); source: authors

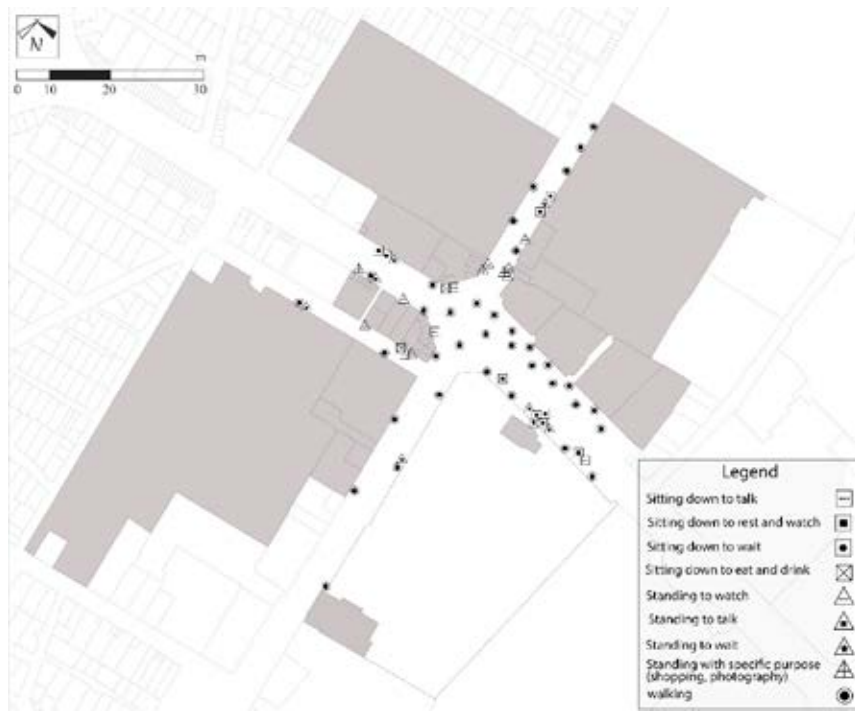


Fig. 8: Locations and types of activities (night); source: authors

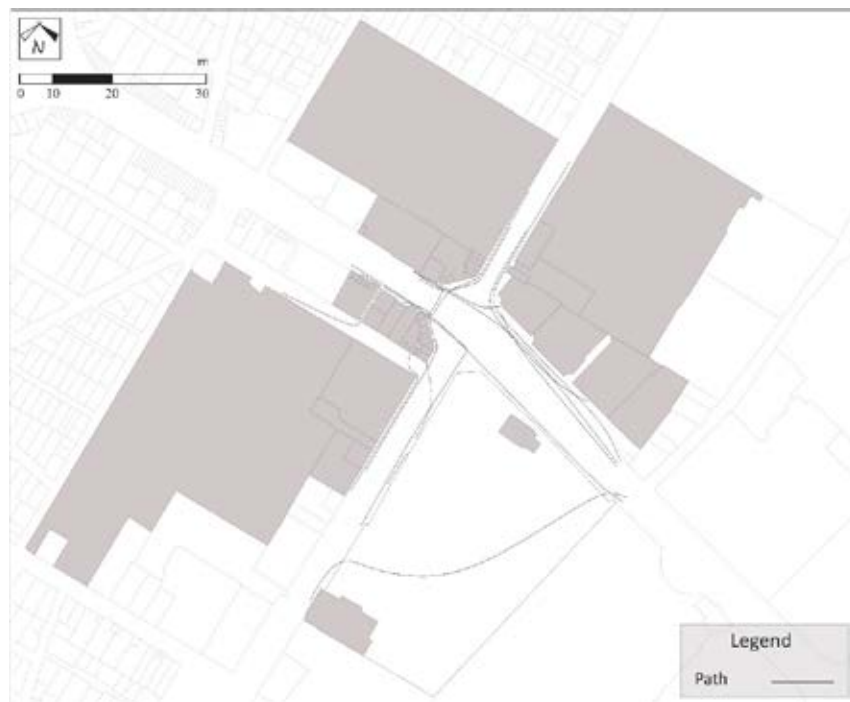


Fig. 9: Tracking the path (morning); source: authors



Fig. 10: Tracking the path (noon); source: authors



Fig. 11: Tracking the path (night); source: authors

based placemaking at the Hafezieh intersection in the following table (Table. 4). The recommendations are compiled based on the dimensions of the research's proposed behavior-based placemaking model.

Previous research in the field of placemaking with emphasis on the existence of types of placemaking (Wyckoff, 2014), has often focused on the ecological (Nouri and Costa, 2017; Gulsrud et al., 2018) and physical dimensions (Ellery and Ellery, 2019). They believe that attention to nature, green spaces and climate change play a role in shaping urban place. It is also important to pay attention to the physical

dimension in designing an urban place. Other categories of research have focused on the social dimensions (Ellery and Ellery, 2019; Wesener et al., 2020) and aesthetic issues of place (Ghavampour and Brenda Vale, 2019) On the one hand, these studies believe that social interactions and mass communication, and visual forms and aesthetic aspects, on the other contribute to successful spatial planning. However, research has rarely considered the place as a behavioral setting and the present study emphasizes behavioral-activity studies related to placemaking.

Table. 4: Behavior-based Placemaking Recommendations at the

Dimension	Suggestions and Recommendation
Form	<ul style="list-style-type: none"> <li>Defining entrances using a variety of flooring</li> <li>Using durable materials on sidewalks</li> <li>Encouraging pedestrians to cross the street using the zebra crossing</li> <li>Using specific memorable elements in the definition of entrances</li> <li>Installing tactile paving and ramps for the presence of all people(inclusiveness), especially on the Hafezieh sidewalk</li> <li>Designing cycle path along Hafezieh walkway toward Hafez avenue</li> <li>Designing appropriate passageways, high-quality levels, and lighting along the way</li> <li>Designing a cycling path with the parking lot</li> <li>Designing pavements using high-quality materials</li> <li>Providing all-out access for all people</li> </ul>
Function-Activity	<ul style="list-style-type: none"> <li>Allocating mixed-uses with activity overflows to the western and northern edges of the intersection</li> <li>Allocating mixed uses to the upper stories of buildings on the northern and western edges of the intersection</li> <li>Creating pause spaces to make behavioral settlements at the entrance of Melli Garden</li> <li>Laying the groundwork for increasing the citizen's participation in social activities occurrence</li> <li>Considering night activities in order to dynamize the space at night</li> <li>Creating multi-purpose pause spaces with various applications at the Hafezieh walkway</li> <li>Providing facilities and activities for pause and relaxation and inviting visitors to move and stay in urban space</li> <li>Improving space conditions for children to play and entertain</li> <li>Supporting street and spontaneous entertainment</li> <li>Exhibiting critical annual festivals in urban public space</li> <li>Formation of street markets with various topics</li> <li>Creating happy and dynamic spaces for children and teenagers to play</li> <li>Designing attractive frontages and soft edges, especially on the ground floor</li> <li>Designing attractive and appealing facades along with the urban space area</li> <li>Refraining from facades uniformity and stretched building facades</li> </ul>
Meaning	<ul style="list-style-type: none"> <li>Considering specific spaces for holding temporary events on the eastern and southern edges of the intersection</li> <li>Using urban elements matching the identity of the area</li> <li>Paying attention to collective memories by considering specific behavioral settlements and diversity of activities</li> <li>Improving the perfect vision of landmarks through diverse flooring</li> <li>Using participation in holding street events and exhibitions</li> <li>Using graphics and illustrations matching the identity of the area on the walls and floor</li> </ul>
Ecosystem	<ul style="list-style-type: none"> <li>Increasing livability by using soft frontages on both sides of Azadi and Hafez street</li> <li>Using tall trees to provide desirable shading</li> <li>Defining semi-transparent frontages utilizing ivy and ornamental plants on the facade of the Melli Garden</li> <li>Improving the condition of urban furniture and installing lighting</li> <li>Implementing movable and light furniture that fits the identity of the area</li> <li>Placing a musical fountain on the Hafezieh walkway</li> <li>Eliminating available gaps in the pedestrian network by installing small pockets of greenery</li> <li>Use of green connections at night</li> <li>Setting public furniture commensurate with shelters against the wind</li> <li>Promoting resting amenities by making places next to water fountains</li> </ul>

## CONCLUSION

In behavior-based placemaking, urban designers should also be acquainted with the evaluation methods of urban spaces based on behavioral studies. As a practical method in behavioral studies, Behavioral observation is based on how people interact with the surrounding environment. In this method, the observer observes the type, time, and place of users' activities, realizes how the environment influences and supports people's behaviors, and which people or groups interact with the space. Observation of behaviors and people's interactions with location helps produce data that can be used to examine people's activities and create a desirable urban place. Thus, attention to behavioral studies, mainly focusing on space users' behavior and behavioral patterns could significantly contribute to successful urban placemaking. This paper aimed to examine the evolution of placemaking in urban design theories to propose a place model based on behavior. First, by examining the importance of the subject and the literature review (Table. 1 and Table. 2), a model of behavior-based placemaking was proposed (Fig. 2). Then in response to the research's main challenge, the authors evaluated the case of the Hafezieh intersection (located in Shiraz County, Iran) (Fig. 4) in terms of static and dynamic activities (Figs. 6 to 11) by using the behavioral observation method (Table. 3). Then, recommendations and suggestions based on the dimensions of the proposed model for for Hafezieh intersection were presented (Table. 4). Behavior-based placemaking emphasizes the behavior aspect as an interaction focal point of functional and meaningful aspects. Humans have an influential role in urban places' desirability by attending to urban spaces and exhibiting diverse behaviors as environmental reactions. Therefore, this type of Placemaking has significant importance in the evolution of urban design knowledge in the contemporary period. Moreover, behavior-based placemaking can be caused to promote sustainable urban design. The most important limitation of this research lies in the prevalence of Covid-19 and the conditions caused by the pandemic that affected the behavior of citizens in urban spaces, which is different from pre-pandemic regular days. This situation also has affected citizens' presence, and most citizens were reluctant to interview and talk to researchers.

Ultimately, The authors recommend that further research on behavioral studies and placemaking

should be undertaken in the following areas:

- The impact of the behavior of different social groups (women, the elderly, children, and the disabled) on place and placemaking
- Determining place improvement behaviors
- How the behavior process is created (from feeling to behavior) in an urban place

## AUTHOR CONTRIBUTIONS

A.R. Sadeghi: Supervision, Funding acquisition, Conceptualization, Methodology, Validation, Writing - Review & Editing.

F. Shahvaran: Project administration, Software, Formal analysis, Investigation, Resources, Data Curation, Writing - Original Draft, Writing - Review & Editing, Visualization.

A.R. Gholami: Project administration, Software, Formal analysis, Investigation, Writing - Original Draft, Writing - Review & Editing.

T. Feyzabi: Project administration, Writing - Original Draft, Writing - Review & Editing.

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## CONFLICT OF INTEREST

The authors declare no potential conflict of interest regarding the publication of this work. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy, have been completely witnessed by the authors.

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