



Explanation of a Model to Predict Place-Based Affordance of Mosques in Tehran, Iran*

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ABSTRACT: This study aimed to investigate the spatial perception and evaluation of the place-based affordance of mosques in Tehran. Reviewing the literature and applying Gibson's affordance and Canter's place theory, the new model called place-based affordance is proposed. In this model, each location contains two potential types of symbolic and behavioural affordance. Accordingly, throughout history, behavioural affordance of mosques including the holding of worship and civic-social activities and their symbolic affordance, including identity, sense of place and community. In this research, to identify the factors that affect the perception and evaluation of behavioral and symbolic affordance of mosques, correlation method or multiple regressions was used. On this basis, four contemporary mosques in Tehran were randomly selected with regional performance and worshipers' responses to the questionnaires were analysed. Research findings indicate that the perception of place-based affordance of mosques, respectively, is influenced by three factors: the physical characteristics, characteristics of perceiving person's perception and context features. Using the proposed model, the place-based affordance of mosque can be identified and particularly the efficacy of affordance for each place, in general, based on cognitive processes and interactions with the environment can be analyzed.

Keywords: The Theory of Affordance, Place Theory, Place-Based Affordance, Behavioural Affordance, Symbolic Affordance.

INTRODUCTION

In the design of new mosques, architectural quality and selection of traditional or innovative architectural designs are always one of the challenges architects confront with. The success rate of innovations and trends occurred in recent years, in the design of mosques to meet the demands of worshipers answer, are not clear. It seems in spite of avoiding the debate about the origins of the shapes and forms in the design and construction

of the mosque, their effects on perception and behavior can be studied. Referring to the opinions and attitudes of the public users of the mosques, through the study of their perceptions and evaluations, we can get a deeper understanding of the quality of design helpful for architects and designers.

In recent years, various models and theories have been developed to explain users' perceptions and evaluations of the built places. The theory of affordance by James Gibson (1979) is one of these theories which has found high acceptance among environmental researchers. In literature on environmental psychology, this theory is used to examine the relationship between environmental performances and explain how to use it. The theory of affordances enables researchers to test the performance characteristics of the environment and the interaction of psychological and behavioral characteristics of the users towards it, simultaneously. The purpose of this study is

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to examine, by employing the theory of affordance by Gibson (1979) and the theory of place by Canter (1977), perception and evaluation of users in a variety of places in general, and four mosques of Tehran in particular. For this purpose, a new concept that combines the functionality of the potential environmental and spatial location features is proposed under the title of place-based affordance.

PLACE-BASED AFFOEDANCE

According to Gibson (1979), affordance of a physical environment, whether good or bad, is what the environment offers with configuration properties, materials and its products. In the theory of environmental design, the concept of affordance, yet simple, is a basic and fundamental concept. The environment affordance can be classified into two categories: direct and indirect. Providing activities by the environment is of the direct type, while the symbolic meanings associated with a reference pattern and usefulness of a model is the indirect type (Lang, 1987).

Gibson (1979) argues that the affordance can have a physical form, such as a piece of fire which produces light and heat. There is another type of affordance that arises in the presence of other people. For example, if in the presence of other people, the amount of social interaction in an environment increases, an environment affordance for collaborative activities will increase. In fact, Gibson believes that the most important and complex types of environment affordance, are such types which are provided in users attendance in the environment. These types of affordance, with their social component, are distinguished from physical affordance. The ambiguity in Gibson's definition presents lack of clear and accurate distinction between physical affordance and affordance provided by other present people in the environment. In other words, it is not clear if people are considered as objects in the environment, which process can be defined as their affordance? If other users attendance in an environment in the presence or absence of others, it will be changed. In other words, understanding the environment affordance is according to the needs, abilities and competencies, during the time, is up to a user, and the presence or absence of other people in the environment does not change the environment affordance.

Considering the ambiguity in the theory of environment affordance in accumulation of physical affordance and users' presence in the environment, this study tries to use Gibson's theory of affordance and Canter's theory of the place (1977), to offer a new concept, called place-based affordance (Fig. 1). This concept explains the potential

affordance of each place. Place-based affordance proves complete understanding the features of places such as neighbourhood, mosque, and school. In this research, we present a general model of place-based affordance and then test four mosques as specific places. To do so, we first review the functions of mosque and its history (Fig. 2). Therefore, the place-based affordance in this research is a combination of environment affordance and place features.



Fig. 1. Basic Theories for the Modeling of General Model of Place-Based Affordance

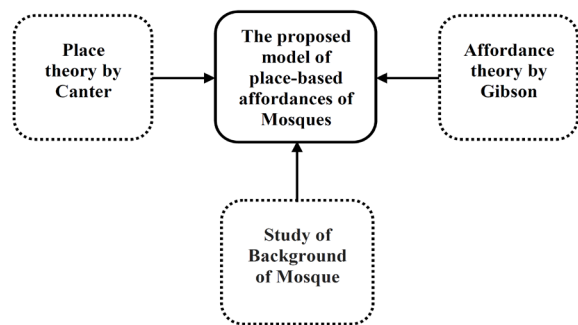


Fig. 2. Study for Develop of Place-Based Affordances of Mosque

Basic Theories for Defining Place-Based Affordance

Canter (1977) in Psychology of Place, seeks to explain the interaction between man and environment with the concept of place and its extension into the realm of the physical environment. Throughout his book, he seeks to describe and explain how places link activities to the physical environment. Hence, Canter regards the place as a unit for analysis of the environment in which people experience their daily life. According to him, every place has three elements: physical features, activities and meanings (concepts) (Fig. 3).

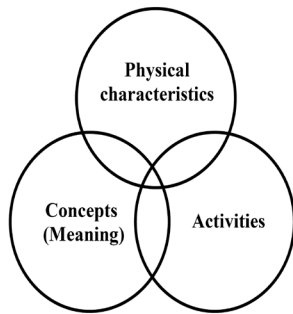


Fig. 3. Place Model (Canter, 1977)

Canter (1997; 1991; 1977) claims places are defined in a combination of physical properties, the activities which are done in it and also the meanings that place bear to people. However, the relationship between the location of physical features, activities and perceptions and meanings that people get from places, are not straight forward and simple. This relationship can best be described by the theory of Gibson on the environmental affordance. Accordingly, it can be said that the affordance of a place could be based on physical features of the place, the activities that occur through people's attending there, and the meaning that it may remind to mind. Meaning of place-based affordance is the affordance that Lang (1987) mentions as indirect affordance.

Using the above, it can be deduced that every place has generally two categories of affordance. The first is the activities that focus on the issues which are happening in the environment, meaning. In the presence of other people and forming activities, environment is potential sources of behaviours and activities, which can facilitate the occurrence of other activities in the area or possibly prevent the occurrence of some others. The Second is the affordance which emphasizes on symbolic meanings of place. The first and second type of affordance can be named the behavioural affordance and symbolic affordance, respectively. Behavioural affordance is based on the components of activities while symbolic affordance is based on the meaning of components as shown in Canter model (Fig. 4).

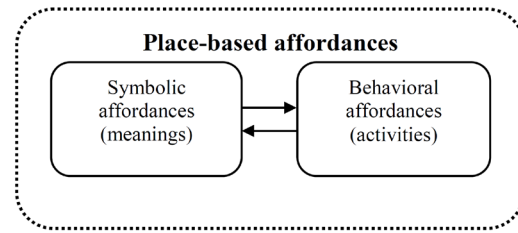


Fig. 4. The Components of Place-Based Affordance

In the environmental psychology literature, several models and theories have been presented to describe the influence of physical context of places on behavior and perceptions of people (Marans & Spreckelmeyer, 1981; Gifford, 2007; Bell et al., 2007). In the most of these conceptual models, directly or indirectly, physical features of environment and psychological characteristics of users are considered as effective factors. One of these models is Bandura's (1974) basic model patterned by using the interaction approach. In this model, the simultaneous interactions between environmental, psychological and behavioral factors are stressed. According to this model, the physical features of environment and psychological characteristics and individual features of people affect their perceptions and evaluations of the environment.

In this study, added to Bandura's model, a third factor named contextual factor is also considered which influences the individuals' perception and assessment indirectly. Figure 5 shows the general model of place-based affordance. This model can be generalized to a variety of places. According to this model, the affordance of any place can be divided into two categories: Symbolic and behavioral affordance. Understanding this affordance is influenced by the physical characteristics of each place, individual and psychological characteristics of perceiving person and contextual factors.

To test the general model in a specific place, it is enough to study just symbolic and behavioral and performance of the place. Then, regarding the known factors which are effective on understanding affordance, we can test hypotheses derived from the model. In this case study, the fitness of the model is investigated in the mosque while its functions are recognized during the literature review related to the mosque.

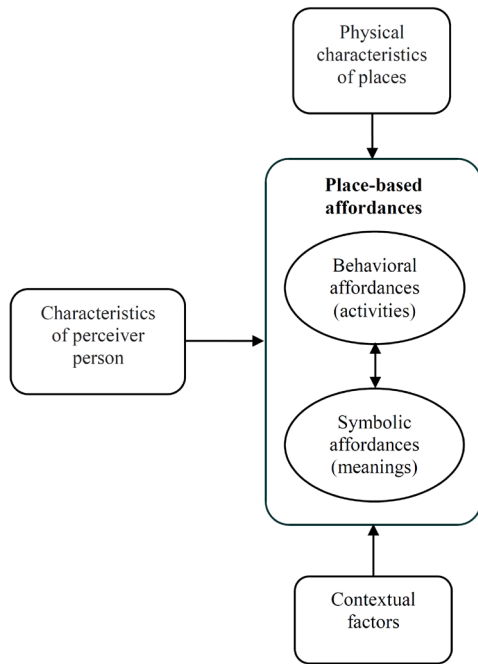


Fig. 5. General Model of Place-Based Affordance

THE PLACE-BASED AFFORDANCE OF THE MOSQUE

In this part, with the background review, the core functionality of mosque based on components of place-based affordance are identified and classified. Table 1 briefly illustrates mosque functions over time, from the perspective of different researchers and writers. From the content of Table 1, regarding the role and function of the mosque in the past, it declares that it has been the main function of the mosque to make people pray, but if necessary, the mosque plays different roles in society.

In addition to the worship function, the most important one is civic roles and social functioning. Some functions such as advertising, education, ideological, political and social activities, community service, judgment, etc. can be considered as a subset of civic functions of mosque. In addition to the functions of worship and civil society, the mosque has been always a place for community gatherings and social cohesion. In addition to these functions, the Mosque is the main symbol of Islamic cities influencing the formation of social identity and sense of place. Thus, we can conclude that the main function of worship mosques in the history of the two species (civil society) is based on the mosque functions of worship and symbolic form. Accordingly, place-based affordance of mosque includes two social-civic and symbolic aspects.

Inclusion of numerous variables (in terms of numbers) in an experimental model could lead to un-testability of model, and in turn, elimination important variables in the model can lead to malfunction. However, there is no model that encompasses all aspects of the real world. The important thing for a model is the relationship between theoretical concepts realized in the abstract framework (Homan, 2007). Therefore, in this study, the conceptual model of this research, not including all variables, may show only variables that fits the purpose of research. Figure 5, shows the general model of a place affordance that also can be used in places other than mosques. Based on this model, each place has two main categories of functionality. The model also shows that three factors; physical features of place, characteristics of perceiving individual and contextual factors affect perception and evaluation of the place affordance. Reviewing the environmental psychology literature, we found that each of these factors includes different variables. Considering these variables, an accurate model for predicting the amount of perception and evaluation of place affordance is achieved. Figure 6 suggests the six variables in the form of a conceptual model.

Table 1. Symbolic and Behavioral Functions of Mosque from the Perspective of Researchers

	Behavioral Functions	Symbolic Functions
Pirnia (2008)	Mosque is a space for Religious worship, dialogue and interaction, training, treatment	Mosque as the most important religious sites, and social, political place to identify the town and neighborhood
Ettinghausen and Graber (1994)	Place of worship; place of governmental, political and educational activities.	Mosques the first religious buildings of Islam, Social and political main centers in Islamic cities



Mortada (2005)	The mosque is a versatile place for worship and social activities, convention, reading Koran, political decisions, relax and civic engagement	The mosque promotes the ability of society, defines hierarchy and loyalty, resolves conflicts in society, and insists on social cohesion. All in all, is a reflection of the concept of nation that has spread from the life of the Prophet in Medina.
Hillenbrand (2004)	Collective worship in the mosque has the highest performance. In addition, the location of: Education and Training, judgment and justice and politics	Is a center to formation of the Muslim community.
Zargar (2007)	The most important function is worship and Advertising	Is a center to assemble and to express identity.
Noghrehkar (2008)	Worship and religious practice, the Center for Negotiation and political discussion	Most appropriate space for self-instructing and society instructing and garlic of all humans from Material and natural life to Reasonable and heavenly life; the mosques are most prominent and magnificent symbol of Islamic cities.

As it has been identified in fig 6, three factors are influenced as independent variables on place affordance perception. Dependent variables consist of two categories of Symbolic and behavioral affordance. These variables are studied in the following:

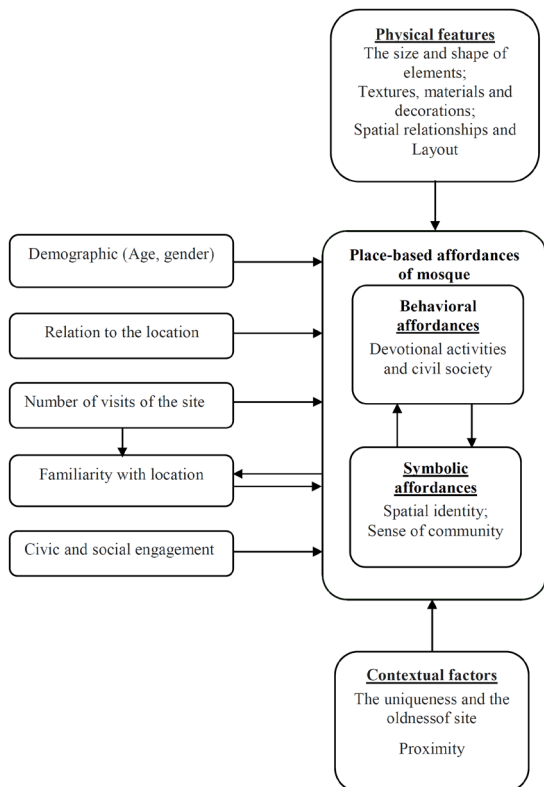


Fig. 6. The Proposed Model of Place-Based Affordances of Mosque

Physical Characteristics: The aim of this study was to test a new model implemented in certain mosques of Tehran as a statistical sample and generalize the results to all the mosques in Tehran, as the population. The purpose of this study, in fact, is not to compare two types of traditional and innovative mosques. We can raise the question whether the physical characteristics of mosques consisting different physical designs different in the manner of supporting activities is related to identity and sense of community. Studies show that physical features of mosques have a direct impact on the perception and assessment of place-based affordance. Falahat, (2005) in a comparative study on the sense of worshipers in traditional and innovative mosques, found that there is a significant relationship between physical characteristics and activities. On the other hand, the physical properties are related to of interest in the mosque. Falahat has categorized the most distinguishing physical features of mosques regarding to both traditional and innovative designs, can be categorized in three groups of the shape and size of the texture elements, materials and decoration, and arrangement and spatial relationships.

Demographic Characteristics: demographic characteristics are important variables in the wide realm of environmental psychology studies in order to have significant exposure. This feature is such important as some of changes in perception measurement can be attributed to physiological changes of people. Hill (1996) in a review of the literature about environmental psychology on psychological perception of sense of community in the local community has concluded that the years of stay in a place and community have some effects on the people's psychological perceptions. Other



variables found by Hill, related to the psychological perceptions of the people include Income, age, education, race, gender and ownership. Due to the frequency of variables, and according to the principle of opportunity cost in the model, only two variables of age and gender will be studied in this research as demographic characteristics of the population.

Individual Relationships with Places: Places that belong to the larger social and physical infrastructure are able to impact the mental image of people. Relationship with the place where the person resides, may affect the place perspective. In the present study, mosque worshippers in the neighbourhood are able to assess more behavioral and symbolic affordance rather than to other transient people who read prayers in the mosque. The variable (relation with place and community) consists of users or respondents residing in the same place or area where the mosque is located.

Frequency of Visiting and Familiarity with Place: It is expected that when people have more knowledge of a particular place, they will have clearer perception and evaluation of its affordance. This ability is originated from familiarity with places. The most important variable of the people's ability to recognize place characteristics is frequency of visiting places. It means, if the individual is cooperative in activities identified in the mosque, then he moves most frequently to visit place. Moreover, the more frequent the visiting is, the more familiarity and interaction the individual feels from activities and other means of communication in the mosque. It may be the reason for people's familiarity with the mosques, if they will not be satisfactory, they avoid visiting such places. So frequency of visiting seems to be related to the familiarity with mosques and both variables are influential on how to assess mosque affordance.

Civic and Social Provisions: According to the general model of research, based on the ground and the areas of activity and its associated meanings, individuals assess the place. Those who are committed in their relationship with the mosque in civic and social obligations, such as those who are members of the Basij mosque center in the neighborhood or those who are members of the board of trustees of the mosque evaluate the mosque differently from others who just go to the mosque for prayers. In fact, it seems civic engagement and social obligations impact on the relationship with the place and its affect the manner of perception and evaluation of the place.

Uniqueness and History of the Place: The affordance of mosques can be assessed at the high level when it is considered in the community as a place that is unique. The individuals may assess symbolic affordance

of mosque with innovative designs more weakly in comparison with traditional designs. Similarly, people may assess traditional and historical mosques so much better according to their symbolic affordance, irrespective of the familiarity period.

Proximity: Proximity together with unique variable and history of places are underlying factors. Proximity and uniqueness are not the physical factors directly related to the place, but can affect the perception and evaluation of the affordance. The proximity with the mosque from home or place of work may influence on the perceptions and evaluations regarding the mosque affordability.

Worshipping and Socio-Civic Activities: As identified in the literature review, historical mosques are considered as a place with a wide range of activities. Despite the diversity of activities, mosques define the mosque as a specific place. The activities of the mosque which were collected by reviewing the historical functions show that the main activities of the mosque are classified into the activities that are related to worship and activities related to socio civic issues.

Spatial Identity: The identity is a part of the nature of the object creating memories and associations and also helps to identify and distinguish an object from others (Rollero & Piccoli, 2010). Place identity and sense of community, according to the research model, are dependent variables that refer to the symbolic functions of mosques in their history. Mosques have had symbolic meanings throughout history. As shown in Table 1, we can say that the mosque has a unique identity to distinguish it from other sites and it has its own independent personality. The unique physical features have created memories and meanings for people over time.

Sense of Community: Based on the historical role of the mosque as a place of assembly and a centre of organization and public mobilization, it is expected they create a stronger sense of community among the worshippers to make their perception. In this study, this variable refers to mosques where a sense of community based on emotional interactions, affiliations, interests, affiliations, and relationship of mosque with the community will be evaluated. Overall, the symbolic affordance in the frame of sense of community and place identity, can partly explain the mosques symbolic functions.

Research Hypothesis

To test the proposed model, the mosque was chosen as a particular place. regarding to the model defined research questions are how the model can be used to predict the place affordance of mosques, what factors have a more



significant role in shaping the perception of mosque affordance after reviewing the literature and achieving a model for prediction of perceived place affordance. these questions can be posed precisely as the following:

- Is there a relationship between the perception of the physical features and place-based affordance of mosques?
- Is there a relationship between psychological and individual features of individuals and perceptions of the affordance of mosque?
- Is there a relationship between contextual factors and perceived place-based affordance of mosques?

Explaining the general model of place affordance, in response to the research questions, three main hypotheses can be raised. As it is shown in the model, place-based affordances, as well as other minor hypotheses are presented. In fact, for each of the lines depicted to relate the variables in the model, we can build a hypothesis. A total of seven hypotheses have been proposed as follows:

- **First Hypothesis:** The physical characteristics of mosques in Tehran and the perception and assessment of place-based affordance are related.
- **Second Hypothesis:** The demographic characteristics of worshipers in mosques in Tehran and of the perception of place-based affordance are related.
- **Third Hypothesis:** There is a relationship between type of prayers, the place and perception of place-based affordance in the mosques of Tehran.
- **Fourth Hypothesis:** The numbers of visiting mosques by the worshipers and their perceptions of place-based affordance are related.
- **Fifth Hypothesis:** The level of familiarity of prayers in mosques and the perceived place-based affordance mosque are related.
- **Sixth Hypothesis:** Level of payers' civic and social obligations and the perceived place-based affordance of mosque are related.
- **Seventh Hypothesis:** The contextual factors and evaluation and perception of place-based affordance of a mosque in Tehran are related.

METHODS

According to the aim of the present study, the type of research is applied to consider how the research data are collected; it is non-experimental based on correlation analysis for prediction, or, in other words multiple regressions. Multiple regression method is a method to study the contribution of one or more independent variables in predicting the dependent variable. In this study, the aim is to predict factors affecting the place affordance of mosques through predictor variables, physical features of place, individual characteristics and contextual characteristics in the mosques in Tehran.

There are about 1747 mosques in Tehran, scattered in different areas with different designs and different functions (URL1: masjed, 2013). The sample population of this research has been chosen among the mosques with local performance. In other words, the scope of activities at the chosen mosques is between multiple areas and urban neighborhoods. Comparison of the mosques built after 1966 in Tehran let us classify them into two types: typical and designed mosques (Falahat, 2007). In the typical mosques, design process has been quick and without planning and methods of making them is often without regulations of building mosque. These are usually small mosques acting in the neighborhood, or an urban area. They don't have specific activities nor design specifications. But designed mosques can be divided according to their plan, into new mosques of traditional design and mosques with new innovative designs.

Because this study seeks to explain how the perception of place affordance in new mosques of Tehran is, consciously and purposefully designed mosques were needed. So, ancient mosques built before the year (1966 AH. S) were not considered as a part of the population and were not intended in research. In other words, the purpose of the model is to fit the conceptual model of place affordance of mosques through surveying sample group and to generalize the results to the entire community. Thus, in the context of statistical population, there are such mosques with the regional activities and part of the new mosques which made consciously and deliberately from the outset for the mosque which are active and people use their affordance. The mosques in Tehran since the year 1966 have been built in two types of traditional and innovative ones such as the Mosque of Hazrat Amir (AS) and Masjid Al-Ghadir. Samples selected for experimental research from the new mosques were in such a way that the reliability and validity of the study results become fit. Hence, in a random poll, of 45 mosques, 4 were selected. The selected mosques include:

- Imam Hussein (AS) mosque in the square of



Imam Hussain (AS)

- Hazrat Amir (AS) mosque in Amir Abad
- Al-Ghadir mosque in Mirdamad Avenue
- Al-Jawad mosque in Hafte-Tir Square

For sampling the mosques, it is necessary to investigate the suitable number of samples with the total number of users in each mosque. Each of the four selected mosque are visited by about 450 to 500 daily prayers. Sample volume of 10% of statistical population makes generalizing results confident and therefore 45 people for each mosque are considered a good number. This is higher than 30, the minimum sample size to investigate the correlation. Thus, the total number of samples will be 180 in four mosques. Obviously, all who are associated with the mosque can understand and assess the place-based affordance of the mosque.

These people include those who attend the mosque as worshippers or people who walk or ride out mosque, some functionality will understand it. In this test, for homogeneity of assessment results, only worshippers who

attend the mosque are considered as the population. In simple terms, the perceiving individual in the conceptual model is a person who attends directly and immediately in the mosque, and understands the place affordance of the mosque. A survey questionnaire was used to assess the worshippers' views through 37 questions. Items of the questionnaire are designed and specified by using parameters extracted from the conceptual model.

In the present study, confirmatory factor analysis method was used to assess the validity. In measurement model chi square value was obtained as 701.25 that is not significant at the level of 0.05, indicating good fit of the model. The PGFI, AGFI, GFI and MSEA values are equal to 0.67, 0.90, 0.94 and 0.004 respectively, which represent a low error rate measurement. Regarding the appropriateness of indicator RMSEA and AGFI, PGFI and PGF indicators, the measurement model is considered favourable and indicates that the validity of this research has been met.

Table 2. The Fitness Measurement Model (Confirmatory Factor Analysis)

Index	Amount
Chi-square	701.25 (P = 1.00)
RMSEA	0.004
GFI	0.94
AGFI	0.90
PGFI	0.67

To ensure the reliability of test, Chronbach's alpha was calculated under questionnaire subscales and total scales. According to the results of the reliability of test,

the reliability of the values obtained for the total scale and subscales indicate good reliability of the tool.

Table 3. Test and Reliability of Coefficients of Subscales

Variable	Cronbach's alpha
Physical Properties	0.694
Characteristics of the Perceiver Person	0.515
Contextual Properties	0.801
The Total Scale	0.877

RESULTS AND FINDINGS

Of 180 questionnaires distributed, 171 questionnaires were returned by the worshippers. Of the 171 received questionnaires, 163 questionnaires were suitable and

defect-free for statistical analysis. Table 4 shows the results of the descriptive statistics for 163 questionnaires. Table 5 illustrates the results of the correlation for the hypothesis of the research.



Table 4. Results of Descriptive Statistics

Variable	Physical Features	Demographic Characteristics	Type of Relationship Person with the Place	Number of Visit of the Place	Amount of Familiarity with the Place	Civic and Social Engagement	Contextual Factors	Place-based Affordance
Average	3.5241	3.1301	3.1175	3.1825	3.9725	2.9935	3.9725	3.7498
Standard Deviation	0.5273	0.4237	0.3738	0.3638	0.3052	0.3348	0.4022	0.3129
Number	163	163	163	163	163	163	163	163

Table 5. Results of Correlation Test

		Physical Features	Demographic Characteristics	Type of Relationship Person with the Place	Number of Visit of the Place	Amount of Familiarity with the Place	Civic and Social Engagement	Contextual Factors
Place-Based Affordance	Pearson Correlation	0.798	0.602	0.653	0.329	0.626	0.327	0.527
	Sig (2-tailed)	0.000**	0.038*	0.029*	0.041*	0.000**	0.044*	0.000**
	N	163	163	163	163	163	163	163

P < 0/05*

P < 0/01**

Based on the result from Table 5, in terms of worshippers' views in Tehran mosque, mosques physical features have a large impact on perception of place-based affordance so that there is a significant relationship between these two variables at the error level of 0.01. Thus, rejecting the null hypothesis, we can conclude that there is a significant correlation between the physical characteristics of mosques in Tehran and place-based affordance are. Also, respondents regarded demographic characteristics effective with significant positive correlation at 95% confidence level on the perception and evaluation of the place-based affordance in mosques. So, in this case also rejecting the null hypothesis, this result is achieved that there is a correlation between the demographic characteristics of worshippers in mosques in Tehran and the amount of place-based affordance in mosques.

As shown in Table 5, the extent of place-based affordance of the mosques in Tehran is at high level and regarding the worshippers' views, the person's type of relationship is effective in understanding space affordance of the mosque. As can be observed, there is a positive significant correlation between these two variables at 95% confidence level. Therefore, we can reject the null hypothesis to claim there is a relationship between the type of person who prays with the place and

perception of place-based affordance in the mosques in Tehran. Respondents also regarded the number of visiting mosques effective in evaluating the perception of place affordance. The correlation between these two variables is positive at 95% confidence level. Thus, we can conclude that the number of visiting mosques in Tehran and perception of place-based affordance are related.

Respecting prayers' views in mosques in Tehran, the extent of worshippers' familiarity with the mosque is effective in perception of place-based affordance. Between these two variables, there is a positive correlation at 99% confidence level. So, there is a relationship between worshippers' familiarity and perceived place-based affordance in the mosques. The respondents considered the extent and type of civic and social obligations influential in the assessment of perception of place-based affordance. As seen, a positive correlation is observed between these two variables significant at confidence level of 95%. In this case, the null hypothesis is rejected and we can say that the level of social and civic obligations and perceived place-based affordance of worshippers in the mosques in Tehran. Contextual characteristics of mosque are effective in assessing the perception of place-based affordance worshippers in Tehran's mosques. As is observed, between these two variables, there is a strong positive correlation which is



significant at the 99% confidence level. So the contextual features of the mosques in Tehran and the perception of place-based affordance are related.

The Multiple Regression Equation

According to the model of place-based affordance and the results for the hypotheses, we can get a mathematical equation to calculate the amount of place-based affordance in mosques of Tehran. Table 6 summarizes the results of the model indicating that the amount of R2 is 0.089.

Table 6. Summary of Model

	R	R Square	Adjusted R Square	Std. Error of the Estimate
Model	0.895	0.809	0.770	0.19001

According to Table 6, correlation coefficient between independent variables and the dependent variable of place-based affordance of model is 0.895 as the acceptable value and therefore the value of the coefficient of determination is equal to 0.809 indicating that about

80.9% of changes in the perception affordance is due to changes in the independent variables which is a high figure and indicates a good fit. Similarly, the correction coefficient is equal to 77% and indicates how model is fitted with the other data taken from the same population.

Table 7. Table of Coefficients

		Physical Features	Characteristics of the Perceiver Person	Contextual Factors
Perception of Place-Based Affordance	Pearson Correlation	0.603	0.678	0.527
	Sig (2-tailed)	0.000**	0.000**	0.000**
	N	163	163	163

P < 0/05*

P < 0/01**

According to the results in table 7, and given that the correlation coefficient between any pair of independent variables is not higher than 0.7, there is no collinearity between independent variables. So, to write the regression

equation of place-based affordance, we can merely examine the relationship between independent variables with dependent pay. Table 8 shows the coefficients obtained.

Table 8. Table of Coefficients

Model		B	Ste. Error	Standardized Coefficients Beta	T	Sig.
1	Constant	8.580E-02	0.115		0.812	0.411
	Physical Features	0.377	0.021	0.326	13.905	0.000
	Characteristics of the Perceiver Person	3.834E-02	0.019	0.044	1.711	0.082
	Contextual Factors	2.33E-02	0.025	0.023	0.845	0.352



According to Table 8 and test research hypotheses, multiple regression equation of place-based affordance in the mosques is calculated as a mathematical equation. Place-based affordance as the dependent variable in this equation is predicted through three predictor variables of the physical properties and individual characteristics and contextual features. In the following equation, the weight of each of these features is calculated:

$$\text{Place-based Affordance} = 0.0858 + 0.377 \text{ Physical Ch.} + 0.0383 \text{ Evaluator Ch.} + 0.0233 \text{ Contextual Ch.}$$

Place-based Affordance Test of Mosques

According to the conceptual model, physical characteristics can affect the degree of perception of place-based affordance. As can be seen in the regression

equation of place-based affordance, physical features, have the most weight in perceived affordance. It is necessary to do another to ensure this finding. Four mosques in the study are different in physical features. Imam Hussein (AS) is traditional in terms of the physical design and Masjid Al-Jawad innovative. Mosques of Hazrat Amir (AS) and Al-Ghadir also have unique physical features. So, according to the conceptual model and the results of the regression equation, the minimum mean of place-based affordance of two mosques must be different. Given the above, the following hypothesis may be introduced:

- Hypothesis A: The mean of place-based affordance of at least two mosques studied varies.
- The null hypothesis: the mean of all the mosques in the study of place affordance, is equal.

Table 9. Analysis of Variance (ANOVA) Test Between Groups

	Sum Of Squares	Df	Mean Square	F	Sig.
Between Groups	2.156	4	1.078	1.856	0.076
Within Groups	67.346	287	0.956		
Total	69.205	291			

Table 10. Comparison of Mean and Significance Tests of Space Affordance between Mosques Studied

Studied Mosque (I)	Studied Mosque (J)	Mean Differences (I-J)	Std. Error	Sig.
Imam Hussain	Hazrat Amir	0.1564	0.0926	0.046*
	Al-Ghadir	0.0752	0.0985	0.144
	Al-Javad	0.2319	0.1284	0.039*
Hazrat Amir	Imam Hussain	-0.1564	0.0926	0.046*
	Al-Ghadir	-0.1029	0.1025	0.173
	Al-Javad	0.1874	0.1521	0.221
Al-Ghadir	Imam Hussain	-0.0752	0.0985	0.144
	Hazrat Amir	0.1029	0.1025	0.173
	Al-Javad	0.1852	0.1354	0.041*
Al-Javad	Imam Hussain	-0.2319	0.1284	0.039*
	Hazrat Amir	-0.1874	0.1521	0.221
	Al-Ghadir	-0.1852	0.1354	0.041*

P < 0/05* P < 0/01**

Due to the value of significance test and rejection of the null hypothesis, this result is obtained that the means of place-based affordance were not the same in all mosques. The numbers in Table 10 show that the average amount of place-based affordance in Mosque

Imam Hussein is greater than Hazrat Amir, Al-Jawad and Al-Ghadir mosques and the average amount of space affordance in Al-Ghadir is greater than that of Mosque Al-Jawad and Hazrat Amir.



DISCUSSION AND CONCLUSION

The present study developed a model to predict and explain the factors affecting the perception and evaluation of worshipers from the place-based affordance of mosques in Tehran. On this basis, the research model was developed with two main aims:

- First, to show how variables such as people, places, activities and related meanings, as well as Physical contexts of places are connected together.
- Second, to show that the general models can be used as a coherent framework for the systematic collection and analysis of data in the empirical studies in different types of places.

As mentioned above, there is not an agreed opinion to consider people besides the physical structure of the environment as factors shaping environment affordance. This study proposes the simultaneous consideration of these two factors, the physical features of the environment and the people present in it as the shaping factors of affordance. In fact, the study focused on the affordances that are provided by other people in the environment. The behavioral affordance is of the richest affordance and through the introduction of behavioral affordances; this study indicates that the presence or absence of others in the environment is effective in motivating users. For example, in the mosque, the presence of other people influences to better meet its objectives, the conduct of worship and of civil social activities and possibly if others do not attend the mosque, the mosque will have less incentive to be used and therefore suffer to provide the behavioral affordance.

Gibson (1979; 1966), in his opinion, is not clear whether he intended people as objects in the environment or as an intermediate in the perceptual process. If people are considered as a cognitively mediated process, the presence or absence of them have the ability to change perception of affordance. Model of research shows that people are mediated by cognitive processes and place-based affordance can be changed with the presence or absence of others. Regression equation of Place-based affordance in mosques illustrates this fact better. In this equation, three variables of the contextual, physical and individual features influence the place-based affordance. In another word, characteristics of individuals place must also be considered to predict place-based affordance. These features can include different variables. Results indicate that individuals who have a special relationship with the mosque and are committed to mosque, like people who are members of the Basij or board of trustees or those of residents contributing

to development and maintenance of a neighborhood's mosque, are believed to have higher perception of affordance. In fact, the findings indicate there is a positive relationship between the level of civic and social obligations of mosque worshipers and perception and evaluation of place-based affordance. It is also resulted more presence in mosques that makes the person be familiar with the features of place and learn more about perceived place-based affordance. Given the above, it can be deduced that the presence of people who have a special relationship with mosques and commit themselves to it along with the other people who use more the affordance of the place increase behavioral affordance. Considering that, this paper examines not only how this event and its mechanism has been clarified but also we can say that the more people participate in various events and activities, the more they have increased potential for the formation of parallel activities.

In sum, it could be argued that the affordance of a place can be divided into two categories: symbolic and behavioral affordance. Behavioral affordance contains activities that can occur in an environment and is representative of the population as a cognitive process mediated. For example, in the presence of other people in the mosque and the formation of various devotional and socio-civic activities by them behavior and activities of the place of the mosque find a potential resource to take place. That can occur in parallel with other activities at the mosque which might facilitate or prevent the occurrence of unrelated activities. In the other words, it could be argued that individual factors can be considered as a determinant of place affordance. People's being active in the physical environment is conducive to the development of its place-based affordance. However, one cannot ignore the impact of the bilateral relationship. The desired place affordance can also increase participation and space-related activities.

The findings indicate that the physical features of the Mosque can affect the assessment of place-based affordance. These features include: The size and shape of elements-Textures, materials and decorations-Place relationships and Layout. Thus, to increase place affordance, these factors in the mosque should be considered in structural design. Physical design of the mosque is the underlying form of signs and meanings over time, and becomes the most important factor in the recognition by the people of the mosque. According to the findings, there is a significant positive correlation between physical features and place-based affordance at the error level of 0.01. Findings are also consistent that place affordance of the mosque for the two mosques



has a significant difference. Between perceived place affordance for mosques of Imam Hussein (AS) and Imam al-Jawad Amir there is a significant difference.

Of the four mosques, the mosque of Imam Hussain (AS) had the highest perceived place-based affordance by the worshippers. Regardless possible differences in the behavioral affordance of the mosques, it seems that due to their different structural designs, place affordance by the prayers is reported to be different. Imam Hussain (AS) with the traditional design is standing against the Al-Jawad with an innovative design. It seems symbolic affordance of the mosque is because of the shapes and familiar forms such as domes, a porch and a within-room which can be more clearly understood and evaluated. This finding can remind designers that people prefer familiar form as a factor of place identity in mosques. The presence of the familiar forms and shapes in the mosque's design makes it easier for audience to make link to their previous experiences. So, we can say that the concepts extractable from any place fit with its functionality. It seems that the level of understanding these concepts depends on several factors, some of which have been identified in the conceptual model of the article.

In general, it is claimed that the proposed model has high adequacy to explain and classify the affordance of a place. Therefore, it is suggested that studies are based on cognitive processes to identification of people's interactions with the environment. The general model of the research can be also tested in other places such as homes, neighborhoods, schools, and etc.



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