

# Investigate and Analyze the Adaptation of Physical Factors with Perceptual-Cognitive Dimensions of the Sense of Place in Public Spaces from Socio-Cultural Perspective; Case Study: Public Spaces in Kermanshah City\*

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## ABSTRACT

Paying attention to the human-environment relationship in environmental psychology and realizing the higher levels of sense of place through the architectural design process enjoy significant importance in the current society, especially due to the poor quality of the public spaces. Since the environmental perception and creating the sense of place are different in each culture, designing in each environment requires understanding the dominate culture. Therefore, the main question of the research is: How do the socio-cultural factors affect the perception and recognition process of the sense of place physical components in public spaces? Also, how can their effects be studied in an explanatory model? Therefore, the current study aims to investigate the realization of the sense of place in public spaces, considering the culture as a moderator variable and adapting the physical factors of these spaces with the perceptual-cognitive aspects of the mind and present the result as a model. Afterward, this model would be validated in case studies. The current research is applied-developmental one in terms of purpose. In the first phase, the research is conducted using the analytical-descriptive method and results in an explanatory model by investigating the previous researchers' theories. In the next stage, the current study is completed statistically using the field approach and surveying the opinions of the users in the case studies. The research results reflect how the sense of place process is formed and how its higher levels are realized from the moment an individual is in the place with an emphasis on the impact of the socio-cultural mainstreams in an explanatory model. In which, the specific impact on perceiving the physique appropriate to the various personal features of the users results in creating different levels of sense of place in public spaces. Therefore, considering the effect of the cultural component, it is possible to achieve different degrees of physical factors preferences in users of each specific region. Then, by considering the cultural factors, users' preference of physical factors of the place in any region, can be reached. Also, with concerning the analysis result, and applying them in public spaces, it is possible to achieve a high level of sense of place, increase the quality of life and compensate for the identity crisis of today's societies.

**Keywords:** Sense of Place, Environmental Perception, Perceptual-Cognitive Dimensions, Physical Factors, Socio-Cultural Factors.

\* This article is taken from first author's master thesis of architecture, with Title "Investigating and analyzing how sense of place physical factors, adapted to its perceptual-cognitive dimensions with socio-cultural point of view". Both are under the guidance of second author.

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## 1. INTRODUCTION

Identity crisis, people's low quality of life, lack of sense of belonging, and place attachment are among the issues created due to the advancement in the human communities, change in people's lifestyle, and lack of attention of the architects and urban planners to the human's environmental behavior and the quality of the designed spaces. In the current situation, the role of design as a tool to form the living environment, meet the human needs and desires, increase the quality level of the spaces through paying attention to the environmental psychology to improve the conditions is of significant importance. This branch of psychology states that human behaviors and experiences cannot be studied separately regardless of the environmental conditions (Rezaei, Keramati, Dehbashi Sharif, & Nasir Salami, 2018). In other words, the human-environment relationship is a two-way relationship that occurs through perception, and environmental psychology addresses it (Nasir Salami & Sohanigar, 2013). In this perspective, the human needs specific spiritual, emotional, and sensory experiences to the living environment. These demands can be met through intimate interaction and identification with the place where they are present. This interaction is called the sense of place, which is a significant factor in the coordination of person and environment and results in better use of the environment, users' satisfaction, sense of belonging, continuity of the presence, and increase in the quality of the life (Falahat, 2006). According to Rapoport, besides the physical elements, the environment includes messages, meanings, and symbols that people decode and perceive based on the roles, expectations, motivations, and other factors and assess them. The created sense in the users after perception and assessment of the environment is called the sense of place (Rapoport, 1990). For Steele (1981), the constituent factors of the sense of place can be classified into two groups: physical factors and perceptual-cognitive ones. On the other hand, humans are active and social creatures with a constant relationship with their environment and need to be in society (Pakzad & Bozorg, 2016). Meeting human's need for love and being in a community also requires a collective physical setting and public spaces have the maximum capability in this regard (Daneshpour & Charkhchian, 2007). However, public spaces are considered less in the architecture scale than the urban one. Also, studies conducted on the sense of place indicate no considerable disagreement among the researchers in defining this concept. Nevertheless, one of the issues is presenting comprehensive opinions and introducing components all of which are the features of good architecture. Also, the sense of place has been less directly addressed. Therefore, the current study attempts to accurately address the influential components in realizing the sense of place in the public spaces. Also, this paper considers culture as an influential factor in humans'

understanding of physical factors. Culture has been less considered in recent studies despite emphasizing its importance. The humans' perception of the physical factors can be different regarding culture, resulting in different spatial behaviors and people's different feelings about the places, eventually determining the environmental quality. In other words, this research seeks to study the way of perception and recognition of the physical factors of the sense of place in the public spaces regarding culture. In order to achieve this purpose, it was tried to analyze and validate its manifestation in two case studies through questionnaire distribution and analysis of its results after presenting a theoretical model.

## 2. RESEARCH BACKGROUND

Given the importance of the sense of place in improving the quality of the urban spaces, especially public spaces, and its impact on collective and personal identity, the current study investigates this concept and analyzes its constituent factors. Also, tries to provide a model to explain the realization of the sense of place higher levels in the public spaces. The main feature of the public spaces is that the collective life states the urban culture and daily issues while having a positive impact on them (Worpole, 1992). The public areas are the most important part of the urban structures and are places where the most humans' contact and interactions occur, and people have constant physical and semantic accesses (Tibbalds, 1992). The conducted studies in this regard acknowledge that public spaces reflect the cultural values, and are the definition to gathering and meeting of the racial groups and different social classes in the urban area (Hayden, 1995). It is clear that the assessment of the public spaces quality depends on the personal perception of the people, and perception is also affected by cultural and social aspects. In this regard, many researchers have studied and reviewed. A brief review of some of the results is presented here. Of course, most previous research has mainly taken a general approach to the subject and has not focused on specific areas. For instance, Stefanovic (1998) in his book "Phenomenological Encounters with Place", states that the sense of place is not the only simple way to explain how a person perceives or understands place. Rather, it is a value and multidimensional concept and is related to the symbolic and emotional recognition of a person in relation to a place. Falahat (2006), in his article "The Sense of Place and Its Factors", believes that sense of place means people's mental perception of the environment and their more or less conscious feelings of their environment that puts a person in an internal relationship with the environment. In such a way that the individual's understanding and feeling are linked and integrated with the semantic context. Steele (1981) classifies the factors that shape the sense of place into two groups: physical factors and perceptual-cognitive factors. He considers the most important physical factors influencing this area as size,

location, degree of enclosure, contrast, proportion, human scale, distance, texture, color, smell, sound, and visual diversity. However, it is better to present this classification in a different way that has been addressed in the present study: Only physical factors intervene in the process of architectural design to achieve the desired sense of place and have different perceptual and cognitive dimensions that how to differentiate and adapt them is considerable and important. In support of this claim, and since the perceptual-cognitive dimensions are mental and individual processes, Golkar (2000), in his article entitled "Components of urban design quality", determines the origin of human perception of the environment in three categories: operational, reactive-emotional, and inferential, and believes that each of them is specific to certain aspects of the physical environment. Khodapanahi and Irvani (2000), in an article entitled "Sensation and Perception Psychology", consider the basis of perception as meaningful and believe that this factor is influenced by values and attitudes affected by the social and cultural conditions of society. It goes so far that according to Shahidi et al. (2015), culture, ethnicity, and geographical climate can even affect individuals' personality traits and behavior.

### 3. THEORETICAL FOUNDATION AND FRAMEWORK OF RESEARCH

In this section, the theoretical foundations of the

research are presented in several parts and based on them, the research theoretical framework is presented as a model.

#### 3.1. Differences between Space, Place, and Other Related Concepts

Heidegger believes that space exists because of place, and it is this place that gives existence to space (Heidegger, 1971). Among the important factors determining the spatial structure of places, insideness/outsideness, boundary, centralization, and enclosure could be mentioned (Partovi, 2004). On the other hand, the place is a part of space created due to the interaction of people with the environment and is expressed and understood by sense (Falihat, 2006). Therefore, it has been meaningful in a cultural group or individual process (Altman & Low, 1992). The spirit of a place includes its architectural and life-giving features (Rezaei, 2019) that have determined its nature (Kashi & Bonyadi, 2013). In other words, the place is an intrinsic and outward phenomenon (Ralph, 2007). The place identity is defined by its distinction from other places and is a basis to recognize the considered place as a unique unity (Lynch, 1960). The relationships between space, place, spirit, identity, and sense of place have been presented in Fig 1. Accordingly, recognition of the relationship between human and place as the sense of place requires understanding the perception process, which will be addressed in the next section.

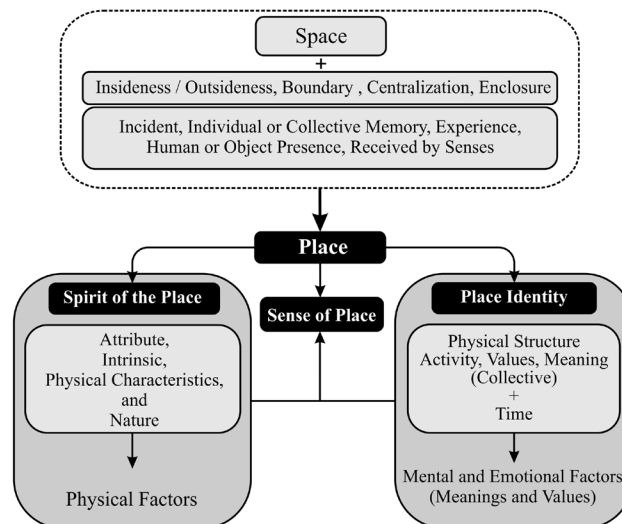


Fig. 1. Relationships between Space, Place, Sprit of the Place, Place Identity, and Sense of Place

#### 3.2. Perception Process in Human-Environment Relationship

Humans are complex beings who can intelligently understand, interpret, and react to issues around them. Therefore, in order to turn particular objectivity into a mentality and use it as a criterion for their evaluation and behavior, it is necessary for them to go through an intermediate stage called perception. Perception

is the process of organizing and interpreting sensory information to make it meaningful (Pakzad & Bozorg, 2016) and meaning is all the mindsets of a stimulus for the observer (Rapaport, 1990). On the other hand, each phenomenon shows meanings in both primary and secondary levels, which include the main characteristics of the phenomena at the primary level and their symbolic meaning at the secondary level (Bourdieu, 1977). It should also be noted that the effective factors

in the formation of different perceptions in individuals are classified into two individual and environmental factors. It must be mentioned that the effect of socio-cultural factors (as an environmental factor) in the perception process (considering its significance) has been considered in the present study.

### 3.2.1. Influential Socio-Cultural Factors in Perception in Public Spaces

The basis of perception is meaningfulness, and one can identify phenomena by its meaningfulness. A significant part of meaningfulness characteristics is values and attitudes influenced by social and cultural conditions (Khodapanahi & Iravani, 2000). Therefore, attitudes, prejudices, socio-cultural values, and thoughts are the determining factors of perception and lead to some differences in it. On the other hand, culture can predispose individuals to certain psychological traits by creating specific personality traits (Leighton & Hughes, 2005). Indeed, the perspective that personality has genetic roots is undeniable. However, environmental factors, one of the most important of which is culture, are also influential in shaping the individuals' personality (Zarani, Behzadpoor, & Babaei, 2017). According to Shahidi et al. (2015), culture, ethnicity, and geographical climate can affect individuals' personality traits. In other words, culture and personality are not independent of each other, and there is a significant difference between different ethnic groups in all aspects of personality. This difference indicates the cultural effect of ethnicity on personality (Shahidi, Nejati, & Kamari, 2015). Most recent research on personality has focused on its six-dimensional model, which classifies individuals' personality traits as extroversion-introversion, adaptation, conscientiousness, neuroticism, openness and welcoming experience, and excitement-seeking (Ahmadi, Babashahi, & Khodashen, 2012). These features can play an important role in architectural designs derived from the culture of each region. In fact, in design, different cultural perceptions and different personality traits of the target community should be identified and acted upon. In other words, since the adventitious mental schemas that lead to perception are influenced by personality traits based on culture and society, design in any environment requires knowledge of the dominant culture. Since human beings need to love and be together, the existence of a physical setting and public space, which has the maximum capacity in this regard, is required (Daneshpour & Charkhchyan, 2007). In protest of the reduction of the role of these spaces in the planning and contemporary urban design processes, it can be stated that the quality of public spaces in cities, especially in architecture scale, has significantly decreased. While many aspects of the quality of social life in society are defined by these spaces and reciprocally reflect the value that people consider for their community (Calthrope, 1993).

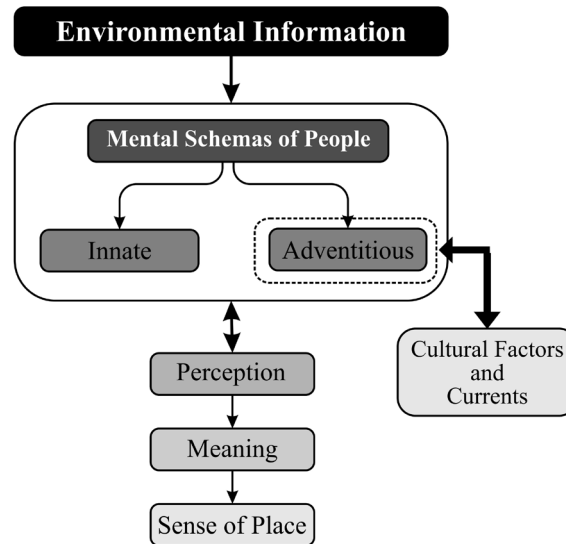
### 3.2.2. Realizing the Sense of Place, Its Constituent Factors, and Levels

According to what has been mentioned, the human evaluates the information in the environmental perception process and has feelings about it. These positive or negative feelings are called the sense of place. Then, these feelings (mindset) become the decision criterion for the person, and the individual's personal behavior emerges as a response or reaction to the environment. Conducted studies indicate that besides physical elements, the environment includes messages, codes, and meanings that people decode, understand and assess based on the roles, expectations, motivations, and other factors (Rapoport, 1990). This sense is a mixture of conscious and unconscious feelings and perceptions and is a rich concept that includes perception, experiences, and people's expression. It gives meaning to a place and affects its users' behavior and attitudes (Shamai, 1991). It is noteworthy that the sense of place is a synthetic type (a situation in which a sense can stimulate another sense), and predicts and combines eyesight, hearing, smell, movement, touch, memory, and imagination (Ralph, 2007). This feeling turns a space into a place with special sensory and behavioral characteristics, feeling comfortable in the environment, supporting the cultural concepts desired by people and their social and cultural relations, recalling past experiences, and achieving individuals' identity. In explaining this feeling, Shamai (1991) considers the three main stages of belonging, attachment, and commitment to the place with seven levels, including indifference to the place, awareness of it, belonging, attachment, and unification with goals, commitment, and sacrifice for the place. Factors reflecting the sense of place are mainly manifested in physical components that can be studied in perceptual-cognitive dimensions with different material and spiritual sources. In fact, a person's feelings about the place express his emotional dimension, understanding, and belief about the body of environment, or in other words, the cognitive dimension of the place. In addition, his behavioral tendencies in a place represent the behavioral dimension of that place in response to cognition (Jorgensen & Steadman, 2001). Features such as identity, history, imagination and illusion, mystery, pleasure, amazement, security, vitality, passion, and memory establish a concentrated relationship with the place (Steele, 1981). Also, physical personality and originality, residents, welfare facilities, and natural factors (water, plans, sky, and sun) are effective in creating a sense of place (Salvesen, 2002).

It must be noticed that in the realization mechanism of the sense of place, identifying and processing the influential physical factors in the mentioned factors are significant. They also can be classified in various perceptual-cognitive aspects. These dimensions are related to the individuals' mental processes whose formation is under biological and environmental

processes such as psychological, social, and cultural and can be less controlled by the designer (Falahat, 2006). However, by proper recognition of their function and application in the architectural design process, the condition can be provided for the optimal effectiveness of the physique in perceptions phases by the user as the environmental information are stimulated through the perceptual process and by the mental schemas, and are directed by human motivations and needs.

These schemas are relatively intrinsic and adventitious and establish a strong link between perception and cognition. The schemas are not only the perceptual processes but also are the emotional reactions and direct the spatial behavior. In contrast, these processes and reactions also affect the mental schemas results from the perceived behavior (Rezaei et al., 2018). Accordingly, as presented in Fig 2, it can be stated that culture emerges in the people's adventitious schemas.



**Fig. 2. The Role of Culture in the Formation of Mental Schemas and the Process of Perception**

Therefore, perception is not only a biological process and is learned through socio-cultural relationships. Differences in environmental perception can be formed as a result of the factors, such as age, gender, ethnicity, personal traits, lifestyle, life expectancy in a place, and the socio-cultural effects of the environment where the person is constantly present. In this regard, motivation and its relationship with demand must be considered. Human has various physical, mental, and spiritual motivations, are the director and organizer of the perception, cognition, and purposive behavior. Behavior also acts to meet the needs and desires. The human desires and needs are classified into functional (physical and mental) and meta-functional (spiritual) groups (Rezaei, Keramati, & Dehbashi Sharif, 2018). In this classification, functional desires include physical and mental factors, and meta-functional desires are based on the worldview and human belief systems. As Frankl, the Austrian psychiatrist and neurologist and developer of logo therapy, states, human needs include tension (thought dynamicity), meaning, self-excellence, eternity and immortality, religion, and emotional friendship (Hassani Bafarani, 2011). Following Maslow's opinions that consider the human needs priority in the biological, security, social, respect, and self-actualization, higher aspects in the spiritual needs can be imagined. Different kinds of the mentioned needs in various origins are influential in people's cognitive mechanisms and perceptual-cognitive aspects draw the sense of place. Therefore,

a classification by Golkar (2000) must be mentioned that determines the human perception origin in relation to the environment in three operational, reactive-emotional, and inferential classes. He also considers each of these classes specific to the special features of the physical environment in relation to the various human needs.

### 3.3. Theoretical Framework and Variables Description

According to the previously stated, it can be said that the place is a result of space plus specific physical factors and other reminder components of events, experiences, collective and personal memories perceived and understood by different senses. In other words, by being in a place, a person establishes a conscious or unconscious relationship with the place and receives the information from the environment. As previously mentioned, the sense of place combines eyesight, hearing, smell, movement, touch, memory, and imagination. Accordingly, the physical factors can be included in the classes related to these senses, the most important of which with the maximum possibility of the designers' intervention was summarized in Fig 3. However, it must be noticed that these factors are not only in a single class, and this classification has been done based on the maximum effectiveness, and some factors can be included in other groups.

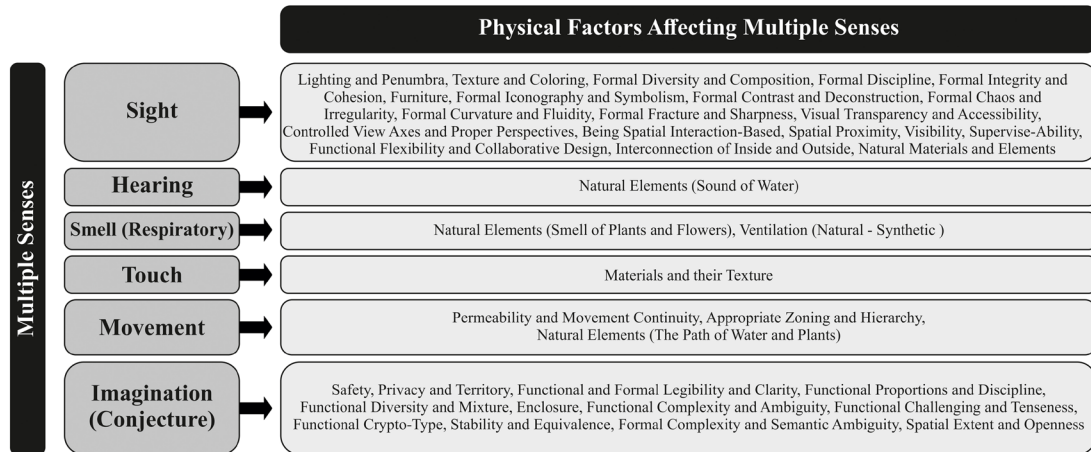


Fig. 3. Physical Factors Affecting the Sense of Place, Based on Multiple Senses

On the other hand, it should be mentioned that this mechanism is different considering the socio-cultural components, attitudes and worldviews, memories, experiences, customs, and people's various personality traits. In terms of the effectiveness of the culture in the process of the sense of place realization, it must be acknowledged that when present in the place, the user's perceived information from the environment is affected by the mental schemas, desires, and needs all. Which are affected by the socio-cultural factors, and the perception process advances under the influence of these factors. Therefore, the perception is different in users, and consequently, different senses and various spatial behaviors in the places can be seen. Hence, people receive information by being in a place, and after perceiving and recognizing the physical factors in one or many inferential, emotional-reactive, and operational classes, analyzes and evaluates them, and gives them meaning in such a way that its result is included in one or two explicit or implicit meaning. Explicit meanings are the immediate and primary ones and are the facial features of the phenomena. Implicit

meanings include the symbolic ones and indicate their cultural, historical, value driven, and emotional concepts. Therefore, the meaning can be considered dependent on the phenomenon in the primary levels, and consider it less affected by the values and culture. However, in the higher levels, it establishes more relationships with people and depends more on their interpretation. This process has been explained in Fig 4. In another perspective, meaning can be classified into two types based on "being in human's mind and affected by values and socio-cultural factors" and "being in the place and related to its environmental and physical features" (Kalali & Modiri, 2012). In other words, meanings in the place are explicit and affected by physical aspects and include immediate cases. The meanings in the human's mind are implicit, affected by social and personal aspects, and include functional, value driven, symbolic, and semantic factors. Indeed, the latter meanings depend on the physical factors shaping the primary meanings that cannot exist without them.

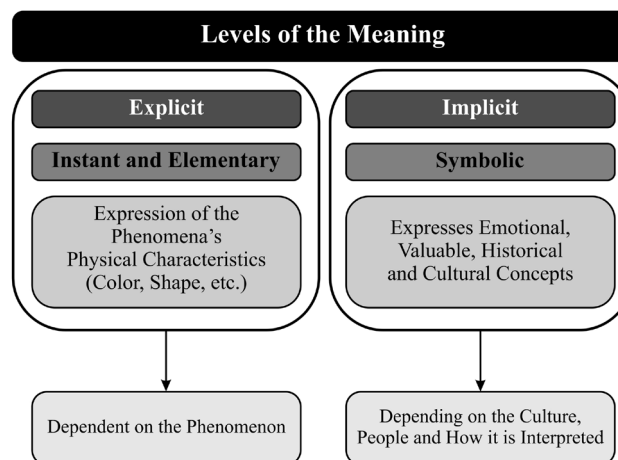


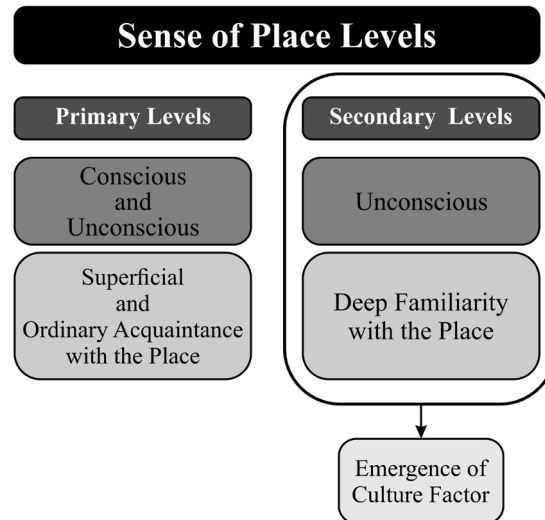
Fig. 4. Levels of Meaning in Relation to Different Dimensions of Perception of Physical Factors

Therefore, understanding the meanings of place at different levels can provide the continuity of presence in place and create a strong link between man and the

environment, which ultimately creates a sense of place and the realization of its high levels such as attachment, commitment, and sacrifice. Therefore, different levels

of sense of place can be divided into two general levels, primary and secondary. At the initial level, a superficial and ordinary acquaintance with the place is created consciously, and the person acts in the place. However, the person does not pay much attention to the qualities or their meaning (indifference to the place or finally the knowledge of being in it). In the middle stage, which is formed consciously and to some extent unconsciously, the person becomes sensitive to the symbols and signs of the place and seeks more familiarity with the place (belonging to the place and also united with its goals).

In the secondary level, the deep familiarity occurs with the place, which has cultural and collective aspects, and the symbols are recognized unconsciously and without thinking. In this level, the person is present in the place and experiences it unconsciously, and is united with the place (commitment to the place and sacrifice for it). Therefore, the impact of culture can be felt more at the secondary level. Fig 5 shows the general levels of the sense of place. It is noteworthy that this sense is mainly positive at the secondary level and can be positive or negative at the primary level.



**Fig. 5. Sense of Place Levels in Relation to Perceptual Dimensions**

Therefore, the mere attention to the physique and the activity in the buildings (as it is common) is not sufficient to create the sense of place in the current situation of the urban environments that lack this sense. In fact, paying attention to the meaning based on the personal traits affected by the socio-cultural factors is important. Also, the effect of the user's historical mentality in the emotional participation and identification with the place (providing the ground for activities to occur) leads to the formation of the secondary level of the sense of place in the users. Therefore, in the correct design process of the architecture to create the desired sense of place, in addition to physical factors leading to the perception of basic and apparent meanings, sufficient attention to physical factors based on socio-cultural influences through the process of recognizing perception and cognitive processes based on personality traits (psychological) is important. It is because planning the physical and architectural features of each building in accordance with the cultural factors of the region can make it better understood by native users and lead to the realization of high levels of sense of place.

In the systematic summary of this section, considering how the physical factors resulting in the sense of place are adapted to the mind's perceptual-cognitive dimensions and the interpretation of environmental meaning, especially concerning public spaces, the architectural physical characteristics of the environment and their

adaptability to the perceptual-cognitive aspects can be considered as an independent variable. Users' environmental perception as an intervening variable, socio-cultural indicators of each region (having a two-way relationship with the dominant personality traits of the people in the community) as a modifier, and the sense of place as a dependent variable, should be considered in the process. Accordingly, design strategies can be presented for the public spaces to create higher levels of the sense of place. The process of the person's presence in the place and the realization of the sense of place for him (the interaction of the mentioned variables with each other) have been illustrated in Fig 6. In addition, the generality of the adaptation of any place's physical factors to its perceptual-cognitive aspects based on the user's personality traits can be seen in Fig 7. According to this, architectural design strategies in each place, including public spaces, can be studied for each of the physical factors presented based on its perceptual-cognitive type and the local users' dominant personality trait (specific to each particular geographical region). For instance, color is one of the most significant factors to stimulate personal emotions. Particular coloring in the environment is related to individuals' features, such as neuroticism, excitement-seeking, and hedonism. Also, the use of the particular colors which are used more in the folklore of the target society is more appropriate.

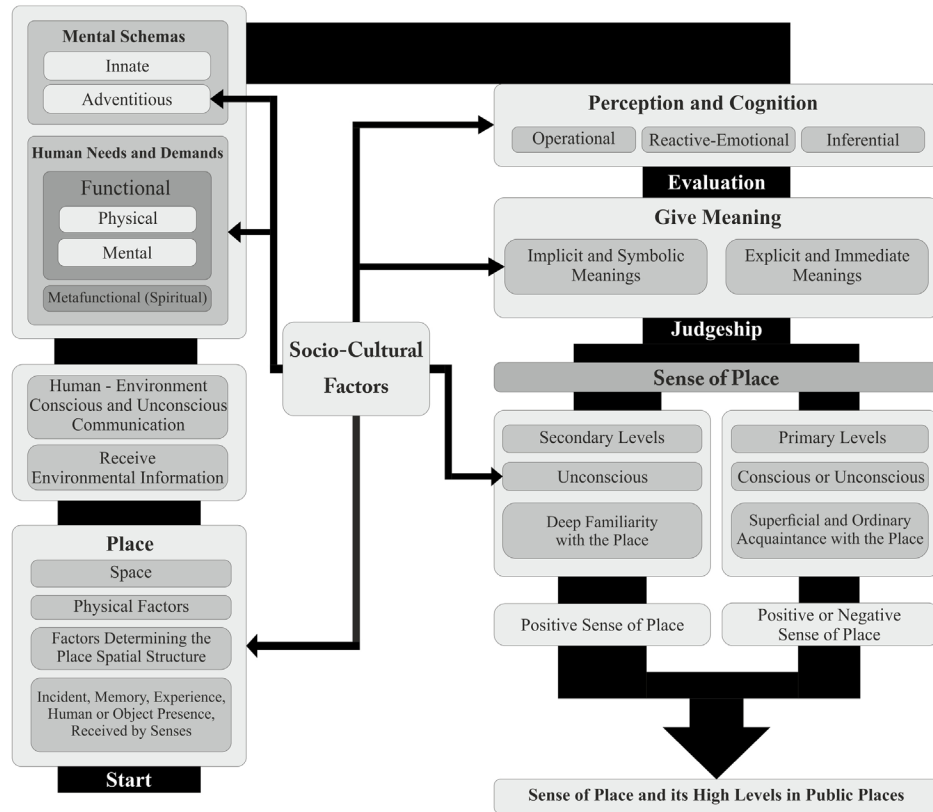


Fig. 6. Diagram Explaining the Theoretical Model of Research

		Perceptual-Cognitive Dimensions					
		Operational		Reactive-Emotional		Inferential	
		Functional	Metafunctional	Functional	Metafunctional	Functional	Metafunctional
Personality Traits	Extraversion - Introversion	Controlled View Axes and Proper Perspectives Visual Transparency and Accessibility Spatial Proximity Visibility Supervise-Ability	—	Spatial Extent and Openness Low Degree of Enclosure Interconnection of Inside and Outside	Formal Integrity and Cohesion	Being Spatial Interaction-Based	—
	Openness and Welcoming Experience	Permeability and Movement Continuity Visual Transparency and Accessibility Functional Flexibility and Collaborative Design Visibility	Natural Materials and Elements  (Light, Ventilation, Water, Flowers and Plants)	Interconnection of Inside and Outside Functional Diversity and Mixture Functional Challenging and Tenseness Functional Complexity and Ambiguity	Texture and Specific Coloring Formal Diversity and Composition Formal Contrast and Deconstruction Formal Chaos and Irregularity	Functional Crypto-Type	Formal Complexity and Semantic Ambiguity  Formal Iconography and Symbolism
	Excitement Seeking	Permeability and Movement Continuity Visual Transparency and Accessibility Visibility	—	Low Degree of Enclosure Interconnection of Inside and Outside Functional Complexity and Ambiguity Functional Challenging and Tenseness	Formal Diversity and Composition Formal Chaos and Irregularity Formal Fracture and Sharpness Formal Contrast and Deconstruction	Functional Crypto-Type	Formal Complexity and Semantic Ambiguity
	Hedonism	Controlled View Axes and Proper Perspectives Functional Proportions Functional Legibility and Clarity Furniture Quality and Arrangement Functional Flexibility and Collaborative Design	Natural Materials and Elements  (Light, Ventilation, Water, Flowers and Plants)	Functional Diversity and Mixture Functional Integrity and Coherence Visual Proportions Interconnection of Inside and Outside	Formal Diversity and Composition Formal Integrity and Cohesion Formal Curvature and Fluidity Texture and Specific Coloring Lighting and Penumbra	Functional Crypto-Type  Privacy and Territory	Formal Legibility, Durability and Clarity  Formal Iconography and Symbolism
	Neuroticism	Safety Functional Proportions Functional Legibility and Clarity Permeability and Movement Continuity Functional Discipline Furniture Quality and Arrangement	Natural Materials and Elements  (Light, Ventilation, Water, Flowers and Plants)	Functional Integrity and Coherence Visual Proportions Interconnection of Inside and Outside Stability and Equivalence Appropriate Zoning and Hierarchy	Formal Discipline  Formal Integrity and Cohesion Formal Curvature and Fluidity	Privacy and Territory	Formal Legibility, Durability and Clarity
	Adaptability	—	—	—	—	—	—

Fig. 7. Classification of Physical Factors in Perceptual-Cognitive Dimensions According to Personality Traits

In the interpretation of Fig 7, it must be stated that to recognize various personality traits' tendency to particular spatial features based on the logical reasoning, all three groups of the spatial features with inferential, emotional-reactive, and operational origins respond to the characteristics of the psychological hedonism. Operational features mainly meet the neuroticism trait, and emotional-reactive features are preferred by the excitement-seeker people. Also, emphasis on the physical factors with inferential perceptual-cognitive aspects in the building's architecture meets the user's needs with the dominant personality trait of opening and welcoming the experience. The lack of allocation of the items from the spatial features to the psychological compatibility trait indicates its neutrality and the adaptation of the people with this trait to the physical factors and spatial features of various groups.

#### 4. RESEARCH METHODOLOGY

The present study is developmental in terms of purpose. It was conducted to investigate and develop the previous theories on the sense of place and present a comprehensive definition. At the same time, it is considered as an applied research, which was done to adapt physical factors leading to a sense of place with its perceptual-cognitive dimensions, especially from a socio-cultural perspective, in order to use it purposefully in designing new buildings. The data collection was performed using a qualitative method in the first phase, to investigate the nature and factors related to the sense of place in order to realize higher levels of it in the public spaces. The main research question is: How do the physical factors of the environment affect the users' perceptual-cognitive process of the mentioned spaces, given the personality traits affected by the region's culture? In the next stage, quantitative field approach and surveying the user's opinions on the case studies were done, and eventually, the obtained data were analyzed and validated using statistical techniques. Focusing on the public spaces of Kermanshah (researchers' residence), the case study was two prominent commercial complexes of this city that had great users on an architectural scale, and an effective survey has been provided in them. The statistical population consists of the Kermanshah's people as the users of the mentioned

commercial centers, and the sample size was obtained 96 using Cochran's formula at the significance level of 90%. Therefore, a researcher-built questionnaire (a combination of visual and descriptive questions) was given to the people. A Likert scale was used to respond. The first part of the questionnaire included descriptive questions, indicating the manifestation of the common physical components in all public spaces. The respondents were asked to score the items based on their preferences. The purpose of designing this part was to rank the physical factors based on the user's preferences under the influence of the region's culture and classification of the user's dominant personality traits. In the questionnaire's second part, a combination of the descriptive and visual questions was raised. It indicated the manifestation of each component in the studied buildings. Then, the respondents were asked to score each based on their preferences. The purpose of designing this part was to evaluate the quality and the degree of manifestation of the considered factors in two studied buildings based on user's opinions. In the first part, the degree of significance of the independent variables was evaluated by the respondents in the region's cultural context. Thus, an importance coefficient was allocated to each component. Then, in the second part, the manifestation of the considered variables was studied in the studied cases. It is noteworthy that the data obtained from the questionnaires were analyzed by SPSS software. After obtaining the normality of the data, a one-sample t-test was used to analyze them. In the end, each factor's score was multiplied by its importance coefficient, and the final obtained result will be described in the following.

#### 5. CASE STUDY (LILIUM AND ARG COMMERCIAL COMPLEXES IN KERMANSHAH CITY)

The case study of the present study includes Arg and Lilium commercial complexes that have been selected from the public spaces of Kermanshah city. The reason for choosing these two examples can be considered their location (center of the city), the characteristics of the architectural index, and the high number of users. The general characteristics of these two samples are presented in Fig. 8.



	Picture	Established Year	Location	Floors and Zones	Notable Features
Lilium Commercial Complex		2019	Jafari Street	Basement = Amusement Park Ground, First and Second Floor = Boutique Third Floor = Coffee Shop and Restaurant Top Floor = Outdoor Restaurant	The Overall Form and Functional Diversity
Arg Commercial Complex		2008	Northeast of Kashani Square	Basement, Ground, First, Second, Third and Fourth Floor = Commercial Fifth Floor = Coffee Shop and Restaurant Sixth until Twelfth Floor = Office	Buildings Location

Fig. 8. Distinctive Features of the Case Studies

## 6. DATA ANALYSIS

After extracting the results of the first part of the questionnaire, the mean scores of the main variables were tested using a one-sample t-test. In this test, the default value was 4, and the confidence level equaled to 90%. Also, the p-value equaled 0.1. Most cases were in the significant range with the value of Sig <0.1. Therefore, each of these factors mentioned in Fig 7 was of considerable importance in the user's minds of the region. It indicated the degree of preference of each under the influence of socio-cultural factors and their mental schemas. It also showed the dominant personality type of the studied society in determining their preferences related to architectural features. Therefore, by referring to these coefficients of importance, it is possible to understand the necessary amount of processing of each of the aforementioned physical factors and categories based on their perceptual-cognitive origins in the architectural design process to meet the maximum needs of users. Then, the results of the second part of the questionnaire were analyzed, and the mean score of each factor was obtained in two case studies.

After applying a one-sample t-test with value = 3 & 4 separately (medium and high importance degrees) in the 90% confidence level and P-Value = 0.1, it was concluded that the difference between all mean scores in the mentioned degrees was significant. The H0 hypothesis based on the mean scores of the factors, which were equal in the two samples, was rejected and the H1 hypothesis, in which the mean values were not equal, was confirmed. Thus, the physical factors presented in the studied buildings are of different degrees of importance to the region's people. Fig 9 shows the mean scores of the variables based on their perceptual-cognitive origins and related calculations. As it is clear, Lilium commercial complex has had higher scores than Arg commercial complex. It has been more successful in gaining the satisfaction of the region's people. Considering the average score in each of the perceptual-cognitive sources for this complex, it is clear that it has performed well in providing physical factors of operational origin and is moderate in factors of reactive-emotional and inferential sources. In contrast, Arg commercial complex has been manifested poorly in physical factors with all perceptual origins.

Perceptual-Cognitive Dimensions						Status	
Operational		Reactive-Emotional		Inferential			
Functional	Metafunctional	Functional	Metafunctional	Functional	Metafunctional		
Lilium Commercial Complex	3.02	4.17	2.58	2.91	1.98	3.06	Group Score Based on the Type
	Average	Good	Average	Average	Weak	Average	Satisfaction Based on the Type
	3.59		2.75		2.52		Group Total Score Based on Perceptual Origin
	Good		Average		Average		Satisfaction Based on the Perceptual Group
	2.95						Total Score
	First Place			Average			Rank - Total Satisfaction
Arg Commercial Complex	2.04	1.00	1.11	1.50	0.93	1.79	Group Score Based on the Type
	Weak	Very Weak	Weak	Weak	Very Weak	Weak	Satisfaction Based on the Type
	1.52		1.30		1.36		Group Total Score Based on Perceptual Origin
	Weak		Weak		Weak		Satisfaction Based on the Perceptual Group
	1.39						Total Score
	Second Place			Weak			Rank - Total Satisfaction
Total	2.53	2.58	1.84	2.20	1.45	2.42	Total Score Based on the Type
	Average	Average	Weak	Average	Weak	Average	Total Satisfaction Based on the Type
	2.55		2.02		1.93		Total Score of each Group Based on Perceptual Origin
	Average		Average		Weak		Total Satisfaction Based on the Perceptual Group
Index: Satisfaction							
							Very Good
							Good
							Average
							Weak
							Very Weak

Fig. 9. Analysis of the Research Data

Thus, Kermanshah's people preferred the physical factors with operational origin in the public spaces and considered the manifestation of the factors with emotional-reactive and inferential origins as their next choices. In other words, the more the spatial features of an environment are functional with an operational

origin, the more successful in meeting user's needs in this region. Accordingly, it can be perceived that in the studied society, the most prominent personality traits include neuroticism and introversion, and compatibility in the next ranks, as expected.

## 7. DISCUSSION

Many recent studies addressed the sense of place in architecture and environmental psychology. They have mainly identified and classified the different levels of this sense and introduced its constituent factors. Among these researchers are Rapoport, Ralph, and Steele, and Shamaï abroad, and Falahat, Kashi, and Rezaei inside the country. Some of these studies have been mentioned in the research background and theoretical foundations. The distinction of the present study with the mentioned studies is the more accurate investigation of the physical factors affecting the sense of place, especially in public spaces, and their classification based on the various perceptual-cognitive aspects, influenced by dominant cultural mainstreams and indices of the communities. It must be noted that in the recent efforts, especially the results of Rapoport's study (1990) the culture has been introduced as an influential component in the realization process of the sense of place. In the present research, it was also attempted to directly study the impact of this variable on the people's personality traits and indirectly investigate their assessment and meaningfulness judgment to the physical factors of the place while introducing the culture as a key factor in the process of recognition and perception (in line with Rapoport's opinion). Therefore, the main purpose of the current study is to investigate the impact of the dominant cultural mainstreams on the manifestation of the local people's psychological traits. It also aims to examine the process of perception and recognition of physical factors by users, to increase their sense of place in public spaces. In fact, these purposes, despite their considerable importance, have not been directly discussed in previous research.

## 8. CONCLUSION

The study was conducted to explain the approaches to the higher levels of the sense of place in the public spaces based on the previous research that studied this concept and its constituent factors. Therefore, it can improve the quality of the designed public spaces in a particular cultural context by presenting useful and practical solutions and solve the identity crisis in current societies. This was done using the mixed method (qualitative-quantitative). Then, after proposing a theoretical model, the current research has validated the model by studying two public spaces in Kermanshah. Thus, creating the sense of place process from a person's initial presence in an environment was presented in an explanatory model that is based on the physical factors adaptation to the user's perceptual-cognitive aspects in the public spaces and considering

the impact of the culture on fixing different people's personality traits, consequently, their perception of the people. This graph indicates that the socio-cultural factors form various mental schemas by affecting the desires and demands and lead to a different perception. It also shows the weakness or strength of people's personality traits and the semantic differences in their minds facing a specific environment. Therefore, particular attention should be paid to the macro-psychological goals related to the cultural context of the region in planning and preparing physical factors in the architectural design process, especially in public spaces. The result is the adaptation of physical factors to the perceptual-cognitive dimensions of users' minds according to socio-cultural indicators affecting their personality traits, which should be considered in the main design strategy on an architectural scale to create the desired sense of place and its high levels in public spaces. As a validation of the research model, as well as the evaluation of the totality taken from the proposed research mechanism, two commercial complexes of public spaces in Kermanshah were studied as case studies. For this purpose, a researcher-made descriptive-visual questionnaire consisting of two parts was prepared and provided to the building users. The first part evaluated the importance degree of people to the various physical factors. The second part measured the manifestation of each factor in the selected cases and the satisfaction degree of users with the buildings' architecture. Then, the data were statistically analyzed, and the hypothesis resulted from the theoretical studies was confirmed. By the explanation that each environment's user is affected by the particular culture of his breeding region, and the privileged personality traits fostered in the society preferred particular organization and physical structure. Accordingly, they seek physical factors with specific perceptual origins in their desired building's architecture. The research concluded concentrations in the functional and, especially operational aspect of the buildings physique in Kermanshah city, which can be considered a result of neurosis, introvert, and relatively compatible personality types of this society's people. Thus, it can be concluded that based on the ruling culture of each region and the formation of the privileged personality traits in it, some of the physical features with perceptual-cognitive origins enjoy more value to meet the people's needs of that society. Also, their purposive analysis in the architectural design of different spaces, including public spaces with wider and important audiences is influential in creating a higher level of sense of place and increasing the life quality to compensate the identity crisis and decrease today's architectural non-places in the society.

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