

Investigating the Role of Age in the Sense of Place in Residential Complexes of Ahvaz; Case Study: Jundishapur and Newside Residential Complexes*

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ABSTRACT

The sense of place is considered an important phenomenon in developing people-environment relations, and it is usually attributed to a group of people who have experienced a place and have developed feelings towards that particular place. People's age can create different interests in environmental indicators. If a sense of place exists in the environment, there will be potential for the interaction of people of different ages. The present research aims to investigate the role of age as well as to verify the indicators of the sense of place in the residential complexes of NewSide and Jundishapur. In the qualitative section, systematic processes of coding, categorizing, and thematization were applied using the grounded theory method to interpret the content of the textual data. First, the experts were interviewed using semi-structured interviews. Interviews were analyzed using Atlas.ti software and open and axial coding methods. In open coding, 44 indicators were extracted, and they were categorized into 9 axes in axial coding. In the quantitative section, a questionnaire with a Likert scale was designed. Cronbach's alpha criterion is used to check the reliability of the questionnaire. Then it was randomly distributed among 373 residents with age groups of 20-40, 40-60, and 60-80. The results show that in the NewSide residential complex, in the age group of 40-20 years old, the largest share of factors was related to activity, memorability, social interactions, and security. In addition, in the age group of 60-40 years old, the largest share of factors was related to security, natural landscape, memorability, and meaningfulness. Further, in the age group of 60-80 years old, the largest share of factors was related to green space, natural landscape, social interactions, comfort, and security. In the Jundishapur residential complex, in the age group of 20-40 years old, the largest share of factors was related to activity, memorability, and social interactions. Further, in the age group of 40-60 years old, the largest share of factors was associated with memorability, natural landscape, and comfort. Moreover, in the age group of 60-80 years old, the largest share of factors was related to memorability, natural landscape, social interactions, and comfort.

Keywords: Sense of Place, NewSide and Jundishapur Residential Complexes, Age, Ahvaz City.

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1. INTRODUCTION

With the development of communication methods in the modern world, social interactions have declined and decreased. In residential complexes, communicating with the environment and perceiving it through various senses has become unstable and has created spaces lacking the necessary efficiency and function (Mahmoodi Nejjhad et al. 2009, 284). Development in modern cities has made human beings, cities, and architecture unfamiliar with meaning and feeling and has created a large number of unknown and meaningless spaces, which has been noticeable in different age groups (Daneshpour, Sepehri Moqaddam, and Charkhchian 2009, 39). So it can be said that these complexes are designed only for certain age groups. In general, losing the idea of the place of life can be one of the dominant crises in the present era and it has caused a change in the perception of memories in the residential complexes of the modern world and has turned them into a place without spirit and feeling (Aegei 2008, 45). The short- and long-term effect of architecture on the human soul and psyche is undeniable. The space can be constructed based on a soulless and cold texture rather than a texture with sense and spirit. In today's cities, a need for places with a sense of place is felt (Nurberg Schultz 2003, 48). Interest in the sense of place has grown rapidly in recent years, and this concept has expanded from spending time to entertainment and a wide range of programs. The concept of sense of place is an interdisciplinary concept that is studied in sciences such as "psychology, sociology, architecture, and geography". However, paying attention to spatial dependence has a historical background (Nurberg Schultz 2014, 52). To extract and categorize sense of place indicators in two residential complexes in Ahvaz city, this research tries to answer the question of how much the factor contribution of sense of place indicators changes in the age groups of the residential complex following indigenous and non-indigenous architectures. Whereas the discovery of these indicators on a large scale is impossible due to "cultural and climatic diversity in Iran", "Ahvaz city" was selected as a statistical population and NewSide and Jundishapur residential complexes of Ahvaz city were selected as the research sample in this study. The research samples were categorized into two separate groups since the architecture of the NewSide residential complex goes back to the Pahlavi II period, while the tradition and principles of Iranian architecture were used in the design of the Jundishapur residential complex. Therefore, it was decided to investigate the role of age in the sense of place of these residential complexes after determining the sense of place indicators in these two design approaches applied in Ahvaz residential complexes.

2. THEORETICAL FOUNDATIONS

"Place is a concept formed in the relationship of people with physical environments, individual and group activities, and meanings". In initial definitions "place is known as a geographical location" (Mujtahidzadeh 2016, 71). The concept of place is at the heart of geography. The Oxford Dictionary of Geography on its part, defines place as "a particular point on the earth's surface; an identifiable location for a situation imbued with human values" (Mahmoodi Nejjhad et al. Bemanian 2009, 284). In simple words, we refer to the physical dimension of architecture as space, which is measurable and has objective factors (Falahat 2016, 59); therefore, color, shape, and form are integral parts of space, because space does not exist without a physical body (Casakin 2012, 13). The terms "space" and "place" are often used interchangeably (Nurberg Schultz 2009, 98).

In his book, "Space and Place", Tuan believes that space is equal to security and space is equal to freedom; we depend on one concept but at the same time, we demand another one (Tuan 2001, 422). He knows space and place as the main components of the world around us (Motallebi 2001, 56). If we imagine the concept of space as one thing that moves, place is associated with stopping. A space can be transformed when it is stopped, visible, and clear; place is a static concept and it can be interpreted in such a way (Tuan 2001, 422). The concept of place is opposed to the abstract concept of space (Nelson, Ahn, and Corley 2020, 242). The researchers concluded that people perceive specific environments as places that are meaningful to them. However, researchers still do not have a complete understanding of how humans experience places, or their feelings as a sense of place. For us, the place is socially defined. However, this definition emphasizes that the place should look interdisciplinary (Kamali 2014, 15). According to Panther's model, "an urban place" is an outcome of the adaptation of three different layers: "physical space, activities, and users' image or perception of space" (Mahmoodi Nejjhad et al. 2009, 283).

Different levels have been defined in the relationship between human beings and place:

Deep familiarity with the place: this level occurs when the person is present in the place and experiences it unconsciously (Grutter 1996, 102).

Usual familiarity with place: this level is the unconscious experience of place, it is collective and cultural rather than individual and involves a deep and thoughtless participation in the symbols of a place (Ryff 2013, 17).

Superficial familiarity with place: this level is the sensitive and unfamiliar person's experience with the place, who seeks to understand the shape and meaning of the place for the people who live there

(Pir Jahangir 2017, 75).

Without familiarity: At this level, the expectations of people facing the space remain at the level of general expectations from urban space and are associated

with the dynamics of performance, social vitality, and spatial identity in the evaluation of a complex (Moore 2014, 195).

Table 1. Different Levels of Sense of Place

Different Levels of Sense of Place	Sense of Dedication to the Place	highest level of commitment and attachment to place, abandoning individual interests for the sake of peace
	Deep Commitment to the Place	Individual's active role in the place due to the sense of commitment to it
	To be Unified with the Goals of the Place	Individual's connection and integration with the needs of the place
	Attachment to the Place	Emotional bond between person and place; the place is meaningful for him and is the center of individuality.
	Belonging to a Place	Awareness of the name and symbols of the place, and a sense of common appreciation of the place
	Awareness of Presence in a Place	When a person is aware of the place but has no feeling
	Indifference to Place	The sense of place is significant in the measurement.

Different indicators may be taken into account to attribute the place name to a space that is briefly discussed as follows:

- Man

The significance of man in defining the issue of place is undeniable. Man interacts with the place from two aspects effectiveness and susceptibility. It is susceptible since no perception is possible without humans (Borer 2016, 119). In his book, Rolf writes: "To be human is to live in a world full of important places. To be human means having and knowing your place and position" (Ryff 2013, 16).

- Time

the passage of time is one of the factors that transforms a space into a place. (Daneshpour, Sepehri Moqaddam, and Charkhchian 2009, 39). Ultimately, it can be said that time is an inseparable variable of place (Moore 2014, 185).

- Experience and repetition

the place is the outcome of interactions of three components: human behaviors, concepts, and physical characteristics (Carmona 2019, 11). Schultz knows "the study of place as the study of the events and incidents that take place there" (Nurberg Schultz 2014, 25).

- Meaning

"Place" is a combination of "ritual, landscape, path, other people, personal experience, emphasizing, and a context for other places" (Wartmann and Purves 2018, 171).

- Sanctity

Sanctity is mentioned in the continuation of the meaning of place. The sanctity of the place is one of the factors that can be defined in the place. The sacred space is always focused on one or more sacred places (Kamali 2011, 15).

- Path and place

the topic of movement is considered one of the significant and influential factors in human life. According to Schultz, how we get from one place to another is the main form of living in the human world (Sajjadzadeh 2013, 83). Life itself can be thought of as moving from one state to another. (Nurberg Schultz 2014, 141).

- Place and culture

"The concept induced by a place and features of human works is derived from the cultural indicators and worldview of that society. In the case of ethics and responsibility, you should also refer to the culture of that society" (Karimi 2018 52). According to Cross, what is expressed in this type of belonging is "the correspondence of the space's structure with the tempers, thoughts, and beliefs of the society people" (Cross 2001, 29).

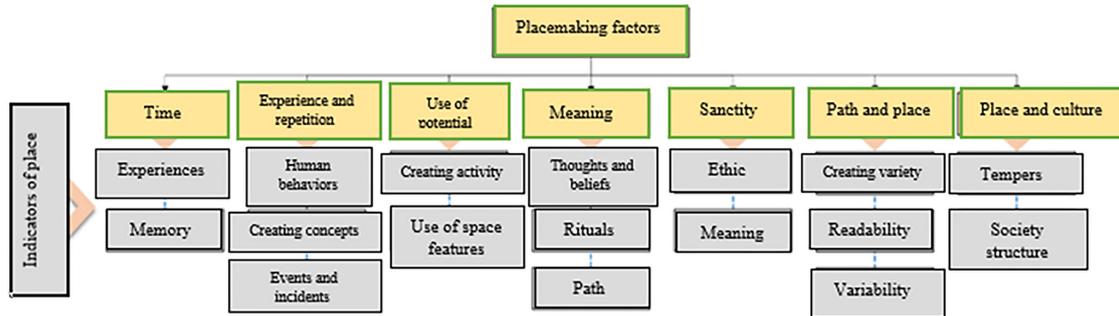


Fig. 1. Placemaking Factors

First of all, this term "expresses human feelings towards the environment"; "the sense that each of us has of a space is different for each person over time" (Falahat 2016, 59). This concept entails a wide range of human-place relations, which includes "the meaning of place and belonging to place" (Borer 2016, 112).

A sense of place "is usually related to the communication of a group of people who experience a place or the feelings that people have about a particular place" (Nurberg Schultz 2014, 17). Sense of place means "people's mental perception of the environment and more or less conscious feelings about the environment" (Pir Jahangir 2017, 78). Sense of place entails "the individuals' experience and expression" and makes a place meaningful, and the individual's sense of place affects his/her "attitudes

and behavior in that place". "This general sense that arises in a person after perceiving and judging the specific environment is called the sense of place" (Casakin 2012, 7).

According to Lynch, the sense of place is a factor that establishes a connection between man and place and develops unity (Lynch 2001, 26). He believes that it has a different interpretation power. The sense of place is a distance, an abstract distance between the self and the place through which understanding the place becomes possible (Tuan 1980, 4). It seems that the term distance used by Tuan implicitly implies the passage of time (Mahmoodi Nejhad et al. 2009, 279). The sense of place comprises a point where the physical element, activity, and meaning resulting from people's experience of the place are intertwined.

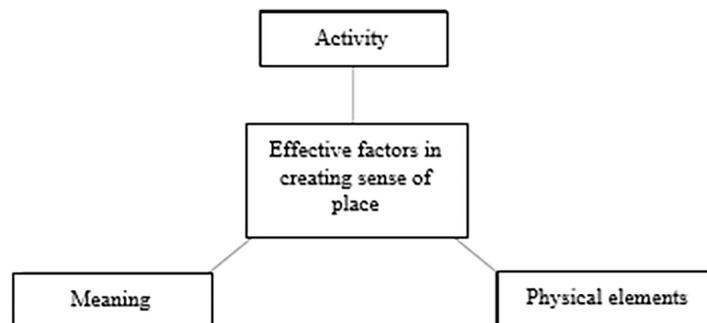


Fig. 2. Effective Factors in Creating a Sense of Place

(Carmona 2006, 6)

"A sense of place emerges overtime during the long-term use of place" (Ryff 2013, 18). The sense of place is "the experiences created by the environment interacted with a person" (Nelson, Ahn, and Corley

2020, 238) Another approach that refers to the meaning of place is that it is "experiential processes about the construction of place such as the meaning and experiences of place" (Syed 2018, 8).

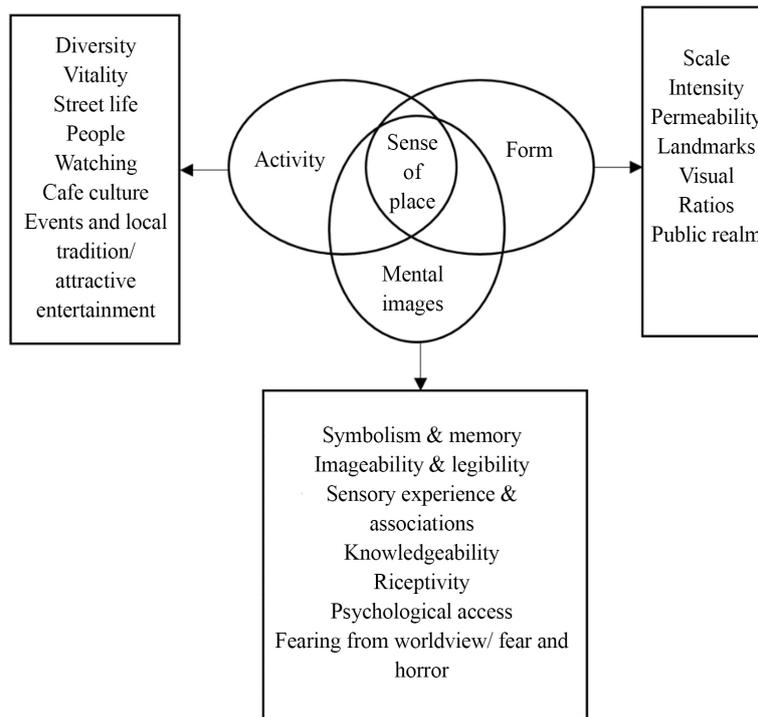


Fig. 3. Sense of Place Indicators
 (Carmona and Tiesdell, 2007)

3. RESEARCH METHOD

The present study is an "applied basic" research that uses the combination method of "nest to nest". The qualitative-in-quantitative "nest to nest method is applied to answer the research questions. The Grounded theory approach was used in the qualitative method for coding, and the "causal-comparative" method was used in the quantitative method for several age groups, which was done by extracting concepts from the "coding of semi-structured interviews" conducted with the experts. Then, the "extracted categories and codes" are used to "formulate the questionnaire". The interview questions were designed based on the concepts extracted from the sense of place. The Delphi

method was used to check and a core the correctness of the questions. The validity of the questionnaire using the "CVI formula was obtained at 0.78 and its reliability was obtained at 0.72 using Cronbach's alpha". Moreover, the "pre-designed coding" table is used for the convenience of the research procedure. Further, the interview is analyzed using "ATLAS.ti software" and "open and axial coding".

3.1. Open Coding

In open coding, a summary of the conducted interviews is provided for each collection separately, and the output of the software is represented in the form of a diagram as follows:

Table 2. Examples of Interview Contents and Open Coding Method

<p>For me, this complex is a reminder of my childhood good days. When entering this complex, the existence of the mosque at the entrance and its resonant voice reminds us of the hours of the day and night. Further, benches and canopies show off themselves and are a place to spend time at different hours of the day.</p>	<p>(Open Coding: Memories, Sense of Belonging, etc.)</p>
<p>The buildings have been designed applying a traditional approach and it can be said that the pattern has been used for their designs. Its plans later were used as a model for constructing other buildings. The volume of the building is very intelligently designed and is representative of indigenous architecture. Certain elements and symbols are used in the design of the complex buildings. The presence of platforms in the space allows the person to stay anywhere in the space and establishes a physical connection with the buildings and the campus of the complex. The buildings are mostly cream-colored and it seems that the building has a certain rigidity, the design scale is human-oriented and proper for all age groups. On both sides of the main volume of the building, there is a very strong two-wing geometry on two floors with a row of brick decorations that are located on a two-meter high platform and complete the building geometry.</p>	<p>(Open Coding: Building Color, Building Materials, Building Façade, etc.)</p>

The porches on the sides of the entrance with simple columns without decorations, the use of stone stairs, and the establishment of the ground floor at a level above the floor are the features of this building. In the space, something memorable may be made perhaps due to collective activities and conversations, but the presence of individuals can also create a kind of individual feeling in the space. There are various floor buildings for riding and walking routes as well as green space, and this diversity creates a kind of attachment in people. The night lighting in some areas can be additional, but it is good in turn and causes excitement and particularism. Views have been repeated. Easy access to the space speeds up the space-relevant issues. The panels are one of the items that can be considered as a means of attachment to space.

(Open Coding: Floor-Building, Urban Furniture, Green Space, etc.)

3.2. Axial Coding

In the axial coding, the codes extracted from the interviews with the experts concerning the NewSide and Jundishapor residential complexes, as well as various actions or interactions between the categories were examined. In this process, special attention was paid to ensure that there were no duplicate open codes. If so, these codes were removed, and the commonality between the open codes was also checked. If so, those codes were categorized as one specific meaning and attribute.

3.3. Sampling

This section includes "two different sampling techniques in quantitative and qualitative sections".

3.3.1. Qualitative Sampling

To investigate the sense of place the indicators and the role of age in the level of attachment to place, a qualitative sampling method i.e., snowball techniques, was first applied to select from among 20 academic experts of the faculties of "universities in Ahvaz City", who enjoyed a full mastery and necessary knowledge of the investigated samples. They were asked to rate the universities with relevant faculties from 1 to 10 based on the extent of their "use of various parameters of sense of place"; next, the complexes with an average score of above 5 were selected and again referred to the experts to "confirm

the selection". Then, 46 experts were interviewed. From the 37th interview onwards, "repetition" was observed in the received information. According to the principles of grounded theory, the "data are collected and analyzed" after conducting the first interview.

Grounded theory is a "qualitative" research method in which a series of systematic procedures are applied to develop an "inductively grounded" theory about a phenomenon. The research findings comprised a theoretical setting of investigated subject matter, not a series of figures and data linked to each other. With this method, not only "concepts and relations between them" were developed, but also they were temporarily measured in two residential complexes. The purpose of applying this method in the residential complex of NewSide and Jundishapur of Ahvaz city was that the researcher did not start the investigation using the theories and assumptions mentioned in the theoretical literature, but to measure the effect of the role of age on the sense of place in a real setting to extract a reliable theory from the data collected. Therefore, according to the analytical procedure of repeated comparisons, the sub-categories of each category are stated and explained concerning the interview data, as well as the paradigm related to each major category. Finally, the intended grounded theory was interpreted and explained by selecting the core category, focusing on the processes of creating a sense of place throughout the data.

Table 3. Interviewees's Expertise

Interviewees	Number	Frequency	Cumulative Percentage
Architecture Professors	16	34.8	34.8
Landscape Architecture Professors	9	19.5	54.3
Urban Design Professors	12	26.2	80.5
Urban Planning Professors	9	19.5	100
Total	46	100	-

3.3.2. Quantitative Sampling

In the next stage, the five-point Likert scale closed-answer questionnaire was compiled regarding the opinions of experts, managers, and presidents of universities as well as the extracted variables. The

questionnaire was structured containing items related to the main research question; that is, investigating the change in factor contribution of sense of place indicators in the age groups of NewSide and Jundishapur residential complexes.

In this research, "Cronbach's alpha" is used to check the "reliability of the questionnaire". "Reliability" refers to "how consistently a method measures something." It is worth mentioning that "reliability" is a tool that is closely associated with validity. For a tool to be valid, it has to be reliable. However, the "reliability of a tool" does not rely on "its validity". The "reliability of a tool" can be objectively measured. Calculating alpha has become common practice in

"survey research" when multiple-item measures of a concept or construct are employed. Before using a questionnaire, its internal consistency must be measured. In addition, the "reliability estimate" indicates the "measurement error rate" in the test. If the components have a "correlation" with each other in a test, the "alpha" value would be increased. In Table 4, Cronbach's alpha of the questionnaire is equal to 0.726 for 44 variables.

Table 4. Cronbach's Alpha for All Available Variables

Cronbach's Alpha	Number of Variables
0.726	44

To do the calculations, scores of 5 and 1 were determined by the experts for "very high impact" and "very low impact", and the questionnaire was distributed among a random sample of the statistical population (residents of the desired complexes) to minimize cost and time. "Morgan's Table" was used to determine the sample size (n=373), which was randomly distributed among the residents of Newside and Jundishapor residential complexes of Ahvaz city regarding the population separately sorted by male and female people. The volume of distributions in the distribution of age groups was based on age groupings in clusters.

4. RESEARCH SAMPLES

This research investigates "two case studies in Ahvaz city" as follows; the figure below shows how the blocks of these complexes are located in two sites. These two residential complexes were selected due to their design with "two different patterns and two different perspectives ". Also, these samples have historical values due to their "originality". "Newside residential complex" is an instance of English

architecture with Howard's "rural-urban" perspective. Three factors of "light, health, and air conditioning" which are the principles of modernism design have been taken into account in this residential complex. This complex is the most real sample of settlement patterns with such a design in Ahvaz city. Meanwhile, regarding the period (the history of contemporary urban development) in which the Jundishapur (Ostadan) residential complex was constructed, this complex has a "critical approach" in its design compared to the housing complexes of its time; the same settlements that were often designed and built based on western approaches and inspired by the concept of Baghshahr. The second matter is that people have settled in this residential complex that the architect planned for their settlement. Therefore, they could evaluate design approaches. To conclude, the first plans for "modernizing the neighborhood concept" have appeared under modern urban development.

All the areas investigated in this research had residential usage and there is no non-residential case among them.



Fig. 4. Location of two Residential Complexes in Ahvaz City

(<https://www.google.com>)



Fig. 5. NewSide Residential Complex
(<https://www.google.com>)



Fig. 6. Jundishapur Residential Complex
(<https://www.google.com>)

5. RESEARCH FINDINGS

In this section, the research findings including both qualitative and quantitative results were included.

5.1. Qualitative Findings

These findings include data extracted from two

methods of open coding and closed coding, which are discussed below.

5.1.1. Open Coding

All the codes extracted from the conducted interviews concerning the two residential complexes are summarized in the diagram as follows:

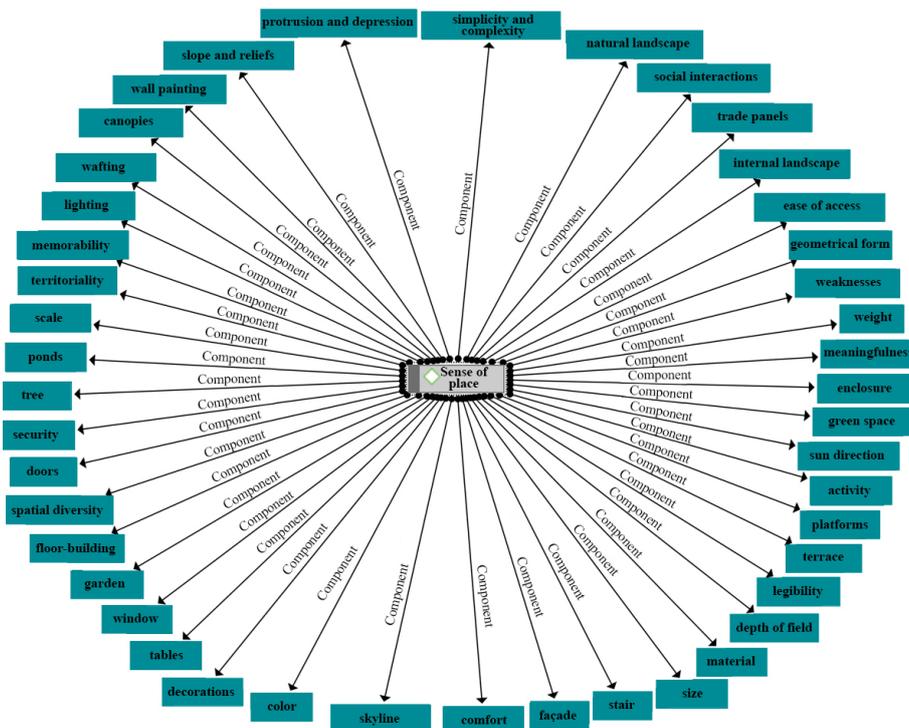


Fig. 7. Open Codes Extracted from All the Interviews related to two Residential Complexes

5.1.2. Axial Coding

According to Table 5, the extracted codes were categorized and the dominance of each code was determined considering their repetition. Moreover, the codes were also categorized according to their commonalities. 23 codes were removed due to non-compliance with theoretical foundations. The categorized codes were associated with the concepts

stated in the relevant theoretical literature of sense of place. Therefore, the lowest dominance in the use of the sense of place indicators is related to the indexes of comfort with a value of 5, wafting with a value of 6, and ponds with a value of 8. Furthermore, the highest dominance is related to the indexes of comfort and activities with a value of 33 and, then, security with a dominance of 31.

Table 5. Coding and Categorizing the Open Codes and Extracting the Axial Code for each Category

Title of Code	Dominance	Type of Code	Extracted Code
Playing with solids, various solids, various geometrical forms, diversity of forms, geometry resulting in forms, various forms, right-corner elements, sharp-corner elements, various forms	17	Physical	Geometrical Form
Green area, vegetation, variety of plants, planting flowers in the area, green space, green area, green plants, green common spaces, several plant models, different plant species, green path, diverse trees, short and tall boxwoods, green boundaries, suitable plant combinations	21	Natural Space	Green Space
Group movement, children's play, individuals' play, playing chess, playing volleyball, reading newspaper, shopping queue, cycling, morning warm-up, sitting in the yard, presence of people in physical activities, shopping centers, commercial centers, shops, existence of a mosque.	33	Functional	Activity
Privatization, personalization, provision of physiological functions, the right to confront intruders, continuous use of space, sense of belonging, sense of ownership in space	29	Social	Territoriality
Different floors, existence of geometric floors, separation of floors through floor-building, designer floors for all seasons, floor-building for the blind	24	Communicative	Floor-Building
Controlling the area with green space, area wall, fencing, walling, different types of walls, division with curb, landscaping of each part	16	Physical	Enclosure
Use of special symbols, specific Iranian decorations, use of native materials, use of vernacular materials, native plants of the region, specific native forms, reminders of past architecture, environmental elements	25	Perceptual	meaningfulness
Human design, design for all age groups, using texture in landscaping, reducing and enlarging the texture using various designs, creating perspective with environmental elements	16	Perceptual	Scale
Flower arrangements, decorations in the area, ornamental plants, evergreens, towering trees, tall and short palms, flowering plants, landscaped lawns, fruit trees	22	Natural Space	Tree
Family tables, chess tables, ping pong tables, multipurpose tables, single and double tables	23	Urban Furniture	Tables
Painting on the building's white walls, paintings behind the panel, informative paintings, epic paintings	21	Vision and Landscape	Wall Painting
Falling walls, damaged façade, uneven paths, water accumulation, lonely places, presence of suspicious people, passages darkness, small panels, ineligibility of the path, not using the vernacular materials	24	Perceptual	Weak Point
Simple façade, façade design reminiscent of buildings in the north of Iran, Iranian façade, brick façade, blank Peru in the façade, façade painting, simple facades, Iranian façade, different and diverse façades, integrating the structure with the façade, beautiful façades, changing the façade during the daylight regarding the sunlight	29	Physical	Façade
Lighting plants, lighting trees, lighting area, lighting building, use of colored lights	23	Spatial	Lighting
Desirable wind, pleasant breezing, persuading the climate to increase wind power, turning the heat to cold air with vegetation, breezing	6	Perceptual	Breezing

Title of Code	Dominance	Type of Code	Extracted Code
Rigid solids, solid elements, light solids, visual weighting, volume-supporting decorations	11	Spatial	Weight
Parents' ability to supervise the children, enclosed vision, vision opening, distance to the created image, lack of legibility, legibility, presence of user and guest spaces, visual enclosure, confusion in space	13	Vision and Landscape	Depth of Vision
Non-parallel intersection, acclivity, downhill, slope division, pedestrian ramps, uneven surface	14	Communicational	Slope and Reliefs
Ease of access, access on foot and by car, close to public transportation, surrounded by different arteries, close distance to the main centers, traffic- and chaos-free	31	Communicational	Ease of Access
Natural platforms, curbs as platforms, seating platforms, multi-purpose platforms, entry platforms, intentionally designed platforms, side platforms	30	Functional	Platforms
An opportunity to construct canopies, vertical canopies, horizontal canopies, window canopies, perimeter canopies, light control umbrellas, fabric canopies in shops	26	Functional	Canopies
Simplicity and complexity, simplicity of forms and complexity of designs	12	Physical	Simplicity and Complexity
Warm colors, buildings color, forms color, colors made from plants, colorful gardens, forms of the same color, brown color, warm color, changing color with light	13	Physical	Color
Wooden doors, patterned doors, metal colors, entrance doors, in the collection, specific doors, large doors, metal doors, prefabricated doors	14	Urban Furniture	Doors
Complete familiarity with the collection, lack of confusion in the space, quick remembering of the collection, learning internal paths, types of internal paths, legible space, high legibility, legibility principle, legibility of spaces	14	Perceptual	Legibility
Different or continuous skyline, buildings of the same size, buildings of fixed height, further horizon view	18	Perceptual	Skyline
Good memories, special memories, sense of attachment, attachment to space, reminder of good days, special ceremonies, rituals	29	Perceptual	Memorability
Water ponds, area ponds, pond fountains, lighting the pond	8	Spatial	Ponds
Spatial diversity, diverse spaces, different spaces, specific definition of multiple spaces, integrating the plants with spaces, multi-functional spaces, multiple contiguous spaces, different spaces, space dispersion, space diversity, irrelevant spaces, relevant spaces,	21	Perceptual	Spatial Diversity
Individuals' conversations with each other, the presence of people in the centers of fictitious neighborhoods, human groups, various interactions, greeting the residents, doing group activities, special age groups in the space	30	Social	Social Interactions
Natural vision and landscape, natural vision, beautiful landscapes, changing landscape in motion, emphasis on landscape for pedestrians, places for sitting	11	Vision and Landscape	Natural Landscape
Integrating the inside and outside vision, inside-out perspective	5	Vision and landscape	Internal Landscape
Building location concerning the sun's direction, the north-south location of the building, use of maximum light, optimal daylight, beautiful daylight	14	Functional	Sun's Direction
Special materials, various materials, stone materials, special differences of façade materials, roof materials, various materials, types of surfaces, different types of materials	13	Physical	Material
Brick decorations, various decorations, window decorations, area decorations, plant decorations, window decorations, vernacular decorations, brickmaking in indigenous style	22	Physical	Decorations
Different terraces, large terraces, seating areas in terraces, large terraces	19	Spatial	Terraces

Title of Code	Dominance	Type of Code	Extracted Code
Colored panels, advertising panels, commercial panels, guiding panels	21	Urban Furniture	Trade Panels
Square windows, cross windows, visually connected windows, wide windows, reminder windows	25	Physical	Window
Short stairs, low-height stairs, campus stairs, separating stairs, various stairs	23	Communicative	Stair
Façade niche and protrusion, façade emptiness and fullness, backward front façades	20	Physical	Protrusions and Depressions
Private gardens, gardening, garden types, integrating the garden with plants, garden space, and types of flowers in several garden models	21	Natural Space	Garden
Environmental peace, silence, thermal comfort, acoustic comfort, internal comfort, a place for spending time	33	Functional	Comfort
Different sizes of stones, micro-macro mesh of materials, similar sizes, micro-coarseness	30	Physical	Size
Visual security, sidewalk security, no entry of strangers into the area, use of CCTV cameras, presence of a guard, controlling the environment, presence of families	31	Perceptual	Security

After extracting the codes, they are categorized according to their commonality with axial coding features. The extraction process led to the

communication dimensions, vision, landscape, physical, natural space, urban furniture, social, functional, perceptual, and spatial features.

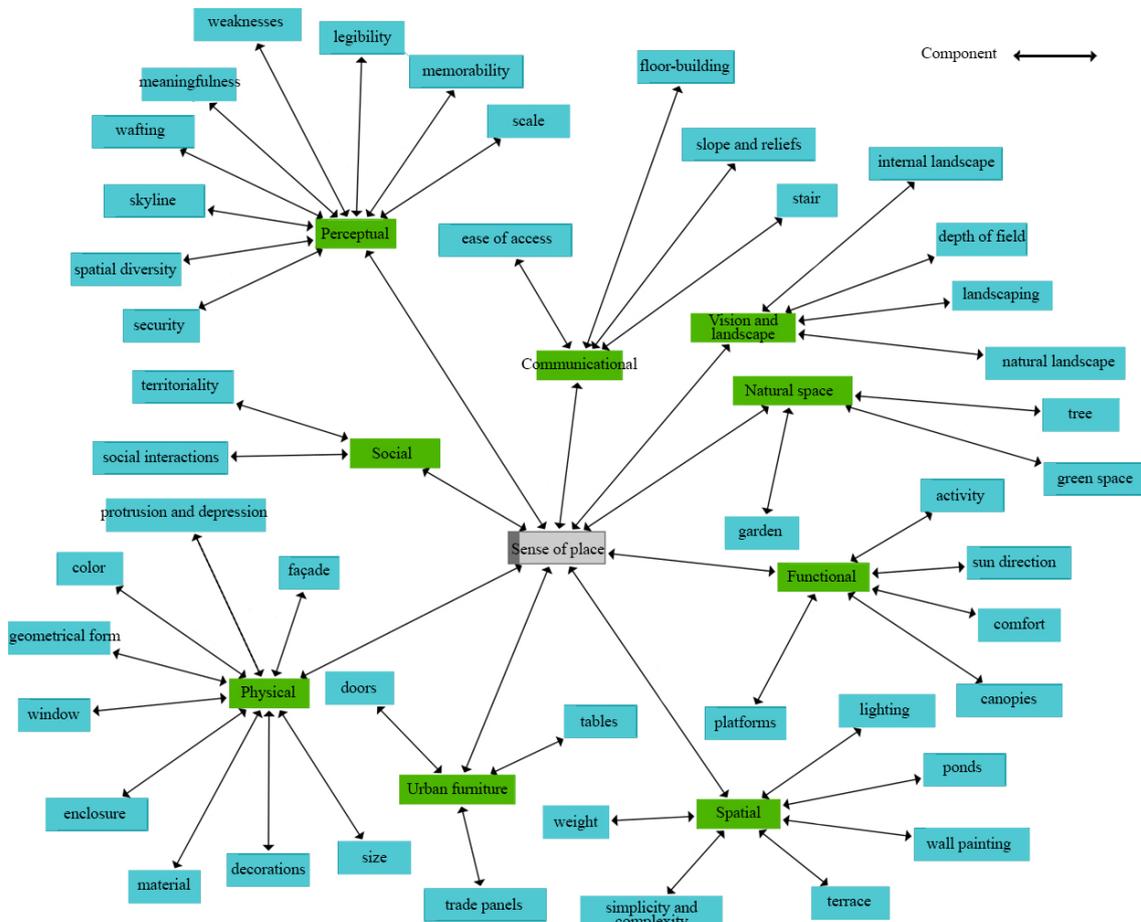


Fig. 8. Axial Coding in Atlas.ti Software

5.2. Quantitative Findings

After extracting the questionnaires, the following chart is drawn, which indicates that, in the age group of 60-80 years, the indicators of comfort, garden, ease of access, and green space have a higher frequency than other indicators, and the indicators of size, sun direction, ponds had the least frequency. In the age groups of 40-60 years, the highest frequency was

related to decorations, lighting, and color. Further, the indicators of breezing, ponds, and size had the least frequency. In the age group of 20-40 years, the indicators of tables, ponds, sun direction, and breezing had the least frequency, and the most frequently was related to façade, decorations, lighting, and geometric form.

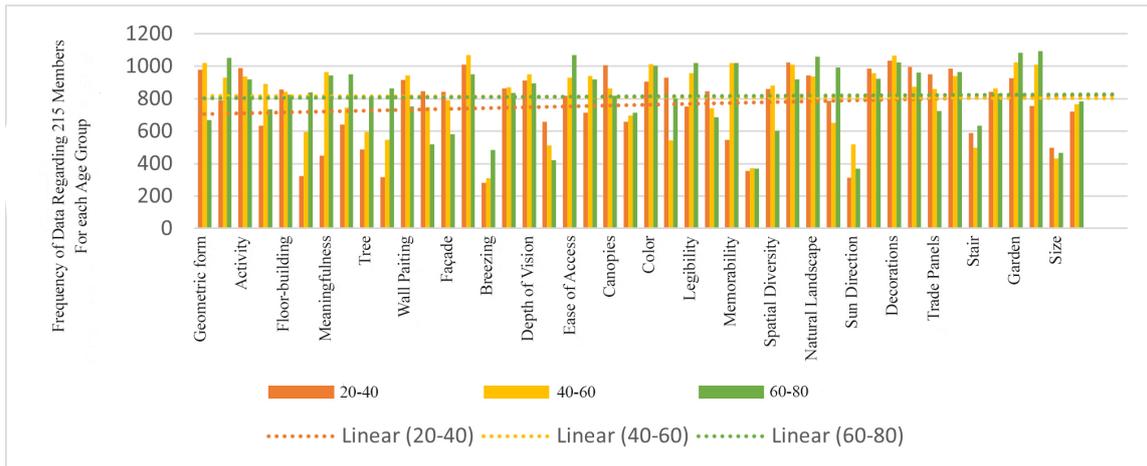


Fig. 9. Frequency of Sense of Place Indicators

In the age group of 20-40 years of NewSide complex residents, the highest factor contribution of indicators of activity, memorability, social interactions, and security was equal to 1.000, and the lowest factor contribution is related to the sun direction (0.262), doors (0.265), and window (0.274). In the age group of 40-60 years, the highest factor contribution is related to security, natural landscape, memorability, and meaningfulness with a value of 1.000.

Furthermore, the lowest factor contribution is related to slope and reliefs (0.254), skyline (0.311), and doors (0.315). In the age group of 60-80 years, the highest factor contribution is related to green space, natural landscape, social interactions, comfort, and security with a value of 1.000; and the lowest factor contribution is related to the indicators of size (0.256), sun direction (0.266), and slope and reliefs (0.244).

Table 6. Stepwise Regression of Different Age Groups in the Newside Residential Complex

Scale	20-40 Years				40-60 Years				60-80 Years			
	Determination Coefficient	F	β	T	Determination Coefficient	F	β	t	Determination Coefficient	F	β	t
Geometric Form	0.867	314.217	0.762	39.451	0.752	527.222	0.781	46.522	0.710	411.342	0.741	44.571
Green Space	0.595	523.147	0.372	44.328	0.920	405.122	0.732	42.152	1.000	444.446	0.429	31.365
Activity	1.000	852.381	0.872	36.823	0.803	217.343	0.662	40.223	0.714	985.752	0.623	31.255
Territoriality	0.625	298.921	0.685	39.362	0.746	199.943	0.648	38.239	0.883	211.223	0.685	58.479
Floor-Building	0.612	247.257	0.597	18.958	0.681	201.612	0.664	8.958	0.619	225.773	0.621	21.982
Enclosure	0.656	644.321	0.436	16.644	0.816	643.623	0.662	11.134	0.836	653.681	0.652	11.134
Meaningfulness	0.645	845.523	0.852	21.422	1.000	849.683	0.652	18.441	0.920	724.654	0.612	24.425
Scale	0.645	754.254	0.665	19.144	0.846	349.603	0.665	19.144	0.654	741.621	0.381	23.132
Tree	0.715	124.541	0.213	39.231	0.814	184.945	0.483	49.173	0.625	512.325	0.484	48.121
Tables	0.514	232.241	0.425	29.914	0.546	276.748	0.464	47.963	0.546	276.748	0.464	47.963
Wall Painting	0.795	201.321	0.414	24.221	0.795	199.943	0.452	46.226	0.881	302.125	0.421	43.564

Scale	20-40 Years				40-60 Years				60-80 Years			
	Deter- mination Coefficient	F	β	T	Deter- mination Coefficient	F	β	t	Deter- mination Coefficient	F	β	t
Weaknesses	0.323	443.124	0.421	48.248	0.243	499.034	0.463	47.228	0.265	519.034	0.631	49.448
Façade	0.958	522.134	0.421	25.288	0.895	523.034	0.472	25.288	0.745	521.125	0.124	15.214
Lighting	0.921	229.265	0.615	65.254	0.978	147.258	0.661	45.256	0.540	149.258	0.311	22.216
Breezing	0.421	323.412	0.424	49.517	0.462	321.564	0.452	41.552	0.368	315.214	0.325	22.552
Weight	0.246	441.211	0.423	25.326	0.331	492.371	0.401	21.356	0.275	458.371	0.425	18.354
Depth of Field	0.821	321.541	0.454	58.351	0.745	471.658	0.411	58.321	0.882	325.695	0.223	32.341
Slope and Relief	0.285	621.991	0.341	29.324	0.254	650.987	0.421	19.694	0.244	621.937	0.529	23.324
Ease of Access	0.675	581.920	0.578	21.825	0.455	542.960	0.589	24.879	0.452	521.210	0.679	28.839
Platforms	0.754	218.654	0.514	31.586	0.781	214.362	0.521	44.587	0.654	520.312	0.628	48.581
Canopies	0.756	752.382	0.542	48.566	0.756	752.382	0.542	48.566	0.756	752.382	0.542	48.566
Simplicity and Complexity	0.661	514.321	0.541	25.618	0.645	699.301	0.545	23.658	0.745	645.317	0.574	29.698
Color	0.874	428.167	0.654	22.131	0.831	421.115	0.411	12.231	0.418	456.235	0.456	32.214
Doors	0.246	431.175	0.221	287.861	0.315	411.325	0.309	16.897	0.325	423.125	0.202	16.807
Legibility	0.727	154.425	0.521	43.418	0.811	161.415	0.517	36.458	0.701	121.405	0.301	13.458
Skyline	0.331	131.421	0.522	33.348	0.311	161.415	0.517	36.458	0.311	161.415	0.517	36.458
Memorability	1.000	461.222	0.524	44.524	1.000	568.211	0.607	24.564	1.000	523.219	0.603	20.542
Ponds	0.275	475.214	0.619	29.325	0.285	475.214	0.619	29.325	0.365	305.211	0.518	39.310
Spatial Diversity	0.963	215.309	0.162	22.421	0.825	245.475	0.562	25.728	0.635	245.415	0.361	28.725
Social Interactions	1.000	216.667	0.902	13.342	0.984	114.112	0.823	21.852	1.000	204.104	0.919	26.811
Natural Landscape	0.624	511.219	0.532	45.525	1.000	582.243	0.451	35.555	1.000	324.221	0.765	23.231
Internal Landscape	0.646	369.256	0.852	28.163	0.590	714.284	0.628	28.126	0.658	520.213	0.338	21.128
Sun Direction	0.271	219.544	0.725	30.811	0.369	215.542	0.745	34.878	0.266	122.272	0.716	65.821
Material	0.735	865.420	0.911	31.011	0.662	825.411	0.923	81.211	0.726	839.420	0.985	55.316
Decorations	0.881	411.159	0.147	47.452	0.860	411.159	0.147	47.452	0.852	241.121	0.326	43.411
Terraces	0.843	572.633	0.436	54.218	0.793	414.653	0.235	24.111	0.681	542.612	0.218	44.321
Trade Panels	0.394	152.485	0.274	91.398	0.781	185.444	0.211	63.326	0.921	215.421	0.224	69.331
Window	0.263	5.117	0.688	1.219	0.309	9.136	0.744	2.881	0.425	7.234	0.812	3.181
Stair	0.374	731.252	0.821	11.256	0.374	731.252	0.821	11.256	0.374	731.252	0.821	11.256
Protrusion and Depression	0.842	37.781	0.835	12.321	0.621	882.781	0.947	42.856	0.316	124.342	0.807	32.214
Garden	0.745	652.312	0.625	77.741	0.831	682.848	0.851	82.381	0.983	372.841	0.213	24.345
Comfort	0.819	935.218	0.308	402.735	1.000	660.188	0.409	174.894	1.000	564.309	0.521	769.821
Size	0.435	524.720	0.856	36.852	0.435	544.660	0.789	28.879	0.256	175.602	0.857	31.574
Security	1.000	856.622	0.932	37.508	1.000	224.662	0.842	40.517	1.000	520.801	0.842	65.717

In the age group of 20-40 years of Jandishapur complex residents, the highest factor contribution is related to the indicators of activity, memorability, and

social interactions, with a value of 1.000, as well as the spatial diversity with a value of 0.963. Moreover, the lowest factor contribution is related to the sun

direction (0.312), doors (0.301), and weight (0.195). In the age group of 40-60 years, the highest factor contribution is related to indicators of memorability, natural landscape, and comfort with a value of 1.000; and the lowest factor contribution is related to slope and relief (0.347), size (0.225) and doors (0.209). In the age group of 60 to 80 years, the highest factor contribution is related to memorability, natural landscape, social interactions, and comfort with a value of 1.000, and the lowest factor contribution is related to indicators of size (0.234), protrusion and depression (0.316), and slope and relief (0.244). The important point in the examination and analysis of the sense of place indicators in two residential complexes is that in the age group of 20-40 years, many indicators affect the development of a sense of place that are related to people in the environment, and psychological aspects in the space induce a sense of place in these people. In general, the development of a sense of place in this age group can be related to

people and humans, but the environmental conditions and environmental details are less effective indicators in this case. So young people's attention to space to create a sense of place is dependent on people, and the environment is less effective in its development. In the age groups of 40-60 years, the presence of people, connection with the environment, and especially visual communication can be considered more effective, and the influence of people in the space has decreased. However, the impact of connection with the environment is still significant, but the environmental details, such as urban furniture or floor-building have no considerable contribution to creating a sense of place. In the age group of 60-80 years, the connection with the environment becomes more prominent, and no special attention is paid to the presence of people in the case of creating a sense of place, but still environmental details are less effective in developing a sense of place.

Table 7. Stepwise Regression of Different Age Groups in the Jundishapor Residential Complex

Scale	20-40 Years				40-60 Years				60-80 Years			
	Deter- mination Coefficient	F	β	T	Deter- mination Coefficient	F	β	t	Deter- mination Coefficient	F	β	t
Geometric Form	0.751	194.217	0.562	29.451	0.663	327.222	0.694	43.522	0.690	161.332	0.691	40.571
Green Space	0.625	403.147	0.592	34.328	0.751	205.122	0.614	39.152	0.896	194.436	0.539	27.365
Activity	0.624	732.381	0.645	26.823	0.907	017.343	0.594	37.223	0.514	735.742	0.593	27.255
Territoriality	0.617	178.921	0.457	29.362	0.686	999.942	0.548	35.239	0.772	961.212	0.585	54.479
Floor-Building	0.597	127.257	0.497	08.958	0.698	001.612	0.598	77.958	0.512	975.762	0.591	17.982
Enclosure	0.654	524.321	0.591	06.644	0.797	443.623	0.661	08.134	0.736	403.671	0.552	07.134
Meaningfulness	0.709	725.523	0.871	11.422	0.985	649.683	0.714	15.441	0.958	474.644	0.532	2.425
Scale	0.691	634.254	0.678	09.144	0.656	149.603	0.708	16.144	0.342	491.611	0.411	19.132
Tree	0.591	004.541	0.475	29.231	0.514	984.944	0.323	46.173	0.587	262.315	0.524	44.121
Tables	0.405	112.241	0.215	19.914	0.449	076.748	0.314	44.963	0.546	026.738	0.514	43.963
Wall Painting	0.681	081.321	0.374	14.221	0.557	999.942	0.392	43.226	0.481	052.115	0.491	39.564
Weaknesses	0.409	323.124	0.485	38.248	0.449	299.34	0.393	44.228	0.465	269.24	0.321	45.448
Façade	0.891	402.134	0.472	15.288	0.647	323.34	0.352	22.288	0.545	271.115	0.119	11.214
Lighting	0.887	109.265	0.596	55.254	0.741	947.257	0.591	42.256	0.380	899.247	0.421	18.216
Breezing	0.395	203.412	0.524	39.517	0.571	121.564	0.362	38.552	0.368	065.204	0.317	18.552
Weight	0.195	321.211	0.471	15.326	0.411	292.371	0.391	18.356	0.475	208.361	0.512	14.354
Depth of Field	0.798	201.541	0.474	48.351	0.645	271.658	0.401	55.321	0.672	075.685	0.219	28.341
Slope and Relief	0.348	501.991	0.475	19.324	0.347	45.987	0.319	16.694	0.244	371.927	0.497	19.324
Ease of Access	0.715	461.920	0.618	11.825	0.512	342.960	0.652	21.879	0.452	271.200	0.518	24.839
Platforms	0.698	098.654	0.424	21.586	0.571	014.362	0.496	41.587	0.654	27.302	0.571	44.581
Canopies	0.634	632.382	0.542	38.566	0.554	552.382	0.418	45.566	0.556	502.372	0.571	44.566
Simplicity and Complexity	0.647	394.321	0.541	15.618	0.705	499.301	0.502	2.658	0.645	395.307	0.574	25.698

Scale	20-40 Years				40-60 Years				60-80 Years			
	Deter- mination Coefficient	F	β	T	Deter- mination Coefficient	F	β	t	Deter- mination Coefficient	F	β	t
Color	0.798	308.167	0.554	12.131	0.798	221.115	0.392	09.231	0.512	206.225	0.391	28.214
Doors	0.301	311.175	0.443	187.861	0.209	211.325	0.298	13.897	0.415	173.115	0.202	12.807
Legibility	0.817	034.425	0.521	33.418	0.901	961.414	0.714	33.458	0.801	871.394	0.524	09.458
Skyline	0.589	011.421	0.522	23.348	0.491	961.414	0.645	33.458	0.611	911.404	0.571	32.458
Memorability	1.000	341.222	0.524	34.524	1.000	368.211	0.915	21.564	1.000	273.209	0.852	16.542
Ponds	0.456	355.214	0.619	19.325	0.385	275.214	0.701	26.325	0.453	055.201	0.698	35.310
Spatial Diversity	0.963	095.309	0.562	12.421	0.995	045.475	0.819	22.728	0.735	995.404	0.756	24.725
Social Interactions	1.000	096.667	1.000	03.342	0.919	914.111	1.000	18.852	1.000	954.93	0.998	22.811
Natural Landscape	0.814	736.622	0.954	27.508	1.000	024.662	0.878	37.517	1.000	27.791	0.914	61.717
Internal Landscape	0.516	249.256	0.932	18.163	0.610	514.284	0.528	25.126	0.658	27.203	0.541	17.128
Sun direction	0.312	099.544	0.717	2.811	0.412	015.542	0.615	31.878	0.466	872.261	0.485	61.821
Material	0.694	745.420	0.671	21.11	0.652	625.411	0.709	78.211	0.526	589.410	0.515	51.316
Decorations	0.852	291.159	0.247	37.452	0.641	211.159	0.214	44.452	0.452	991.110	0.221	39.411
Terraces	0.798	452.633	0.526	44.218	0.547	214.653	0.315	21.111	0.481	292.602	0.428	4.321
Trade Panels	0.358	032.485	0.194	81.398	0.521	985.443	0.297	6.326	0.321	965.410	0.119	65.331
Window	0.568	38.117	0.718	219	0.412	7.136	0.694	17.881	0.625	45.224	0.919	26.181
Stair	0.514	611.252	0.791	01.256	0.774	531.252	0.859	08.256	0.374	481.242	0.623	07.256
Protrusion and Depression	0.721	25.781	0.631	02.321	0.521	682.781	0.803	39.856	0.316	874.331	0.861	28.214
Garden	0.689	532.312	0.595	67.741	0.794	482.848	0.898	79.381	0.983	122.831	0.541	20.345
Comfort	0.923	815.218	0.418	302.735	1.000	46.188	0.639	144.894	1.000	314.299	0.774	729.821
Size	0.501	404.720	0.816	26.852	0.225	344.660	0.659	25.879	0.234	925.591	0.551	27.574
Security	0.853	194.217	0.814	29.451	0.874	327.222	0.757	43.522	0.976	161.332	0.853	40.571

After determining the determination coefficient of the obtained indicators in each age group in both residential complexes, the diagram of fitting between different age groups of 20-40 & 40-60, 20-40 & 60-80, and 60-80 & 60-40 is drawn. There is a significant correlation between the answers obtained

from the age groups of 20-40 years and 40-60 years, and these answers can be used to examine different samples from the same age group, but there is a weak correlation between both of those age groups and the answers given by the 60-80 years age group.

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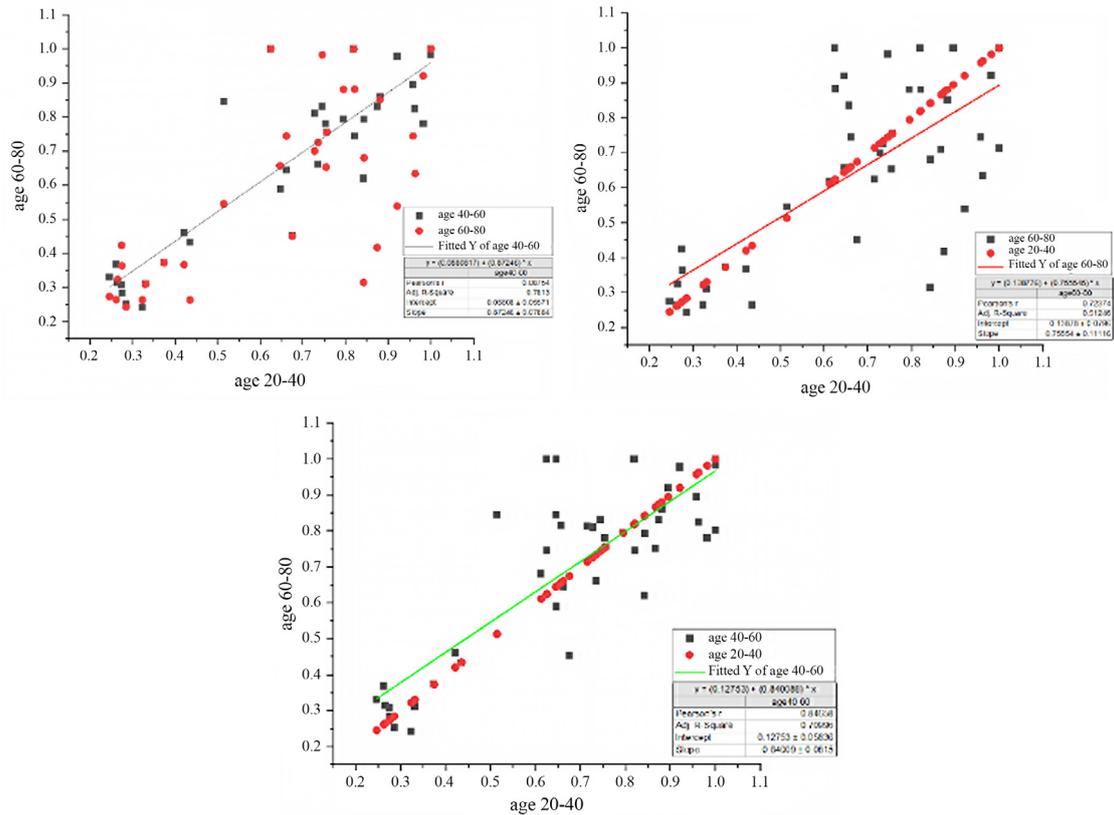


Fig. 10. Fitness between Indicators of the Sense of Place in Different Age Groups

According to the surveys conducted in the Jundishapor and NewSide residential complexes, different age groups have a direct effect on the "interaction with the place" and "participation of individuals and groups" and, ultimately, "attachment to place". It means that "people's age" and "interaction with place" would have a positive effect on "attachment to place" by affecting the emotional dimension of the "attachment to place" process. Despite the expectations, regarding the represented charts, the 20-40 age years age group tends to be settled in these residential complexes more than other groups.

6. DISCUSSION AND CONCLUSION

The sense of place is an inner connection that occurs between a person and his surrounding environment through individual perception and develops imaginations in his/her mind that is representative of the level of his/her relationship with the surrounding environment. This relationship is promoted in the environment with time due to its repetition in different seasons as well as the passage of life in space. However, the individuals' perceptual and mental features change over time after the passage of several years, and signs of indifference and undervaluation of these variables in different age groups are observed and their characteristics and attention towards the environment and its relevant factors are changed

over time due to aging. The individuals' surrounding environment can have different effects on them at different ages and change their moral characteristics, and the environmental markers are differently interpreted in different age groups.

In the age group of 20-40 years of NewSide complex residents, the highest factor contribution was related to the indicators of activity, memorability, social interactions, and security. Further, in the age group of 40-60 years, the highest factor contribution is related to security, natural landscape, memorability, and meaningfulness. Moreover, in the age group of 60-80 years, the highest factor contribution is related to green space, natural landscape, social interactions, comfort, and security.

In the 20-40 years age group of the Jandishapur complex residents, the highest factor contribution is related to activity, memorability, and social interactions. Further, in the 40-60 years age group, the highest factor contribution is related to memorability, natural landscape, and comfort. Moreover, in the 60-80 years age group, the highest factor contribution is related to memorability, natural landscape, social interactions, and comfort. What can be observed is that living in these residential complexes requires participation and social interactions as it requires empathy with events, memories, and roots. These factors pave the way for the people to communicate with each other as well as their comfort and will cause

an increase in the security of these complexes and, as a result, the sense of belonging to the space and meaningfulness of the environment.

Furthermore, it was revealed that environmental factors have three different states at different ages or, in general, do not change. Moreover, with increasing age, no change is observed in the type of perception by people and its effect on the sense of place. For instance, indicators such as geometric form or environmental component have lost their value in the environment over time and their effects on the sense of place have decreased, such as spatial diversity, or the factor contribution of the component increases with increasing age, such as the green space component. In

general, the following suggestions are proposed to be considered in the design of residential complexes to increase the sense of place for all age groups:

- Conducting pre-design studies in all age groups in the environment of residential complexes concerning the types of open spaces
- Researching age disabilities in the elderly, which lead to their inaccurate perception of the environment.
- Evaluating the effectiveness of environmental factors in inducing a sense of place in residential complexes concerning the age groups
- Providing welfare facilities for the elderly so that they don't have any problems spending a long time in the environment.

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CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

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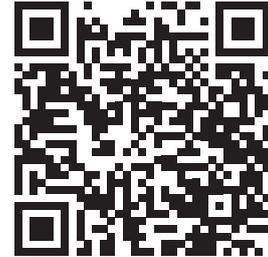
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