Review Paper

A Mathematical Framework for Evaluation of Stagnation and Movement in Architectural Spaces, Case Studies: Iranian Traditional Houses

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Abstract
Derived from a research work of the same title, this article aims at recognizing the spiritual characteristics of the concept of dynamism and motion in the Iranian traditional architecture as well as its manifestation in the connector spaces of traditional houses. These valuable buildings represent the diversity of movement and stagnation for reaching eternal concepts through reproduction and variation of their elements. An Iranian architect expresses these two concepts of Islamic transcendental goals by contrasting combinations both in form and space. The key questions arising here are: what are the characteristics of movement and stagnation in Iranian traditional houses? What are the concepts of movement and stagnation in the architecture of the connector spaces in traditional houses? To answer these questions, a case study was conducted by combination methods. The required information was collected by desk and field studies. Ten traditional houses in Qazvin were selected as samples. According to the results, the movement both in the form of physical and sensational movements can be identified in traditional Iranian architecture. Physical movement or criteria such as moving in space and eye movement and sensational movement can be analyzed by influencing the feelings of viewers as well as the rest provided by a pause atmosphere.

Keywords: Movement, Stagnation, Mathematical order, Geometric understanding of space, Traditional houses of qazvin.

1. INTRODUCTION

It would seem that movement cannot be related to architecture because buildings are static but architecture expects the observer to move who must be in motion to experience and perceive the architecture inferred from architecture, form, space, and order.

Plummer (2016) believes that movement is a vehicle for understanding form and space, and movement in architecture is an organized system of various types of movements stimulated by architectural elements.

The types of movements in architecture not only include the physical movement of a person in space, which is related to physical coordinates but as Ahmadi (2019) explains, other movements are associated with the mental and sensational coordinates of an explorer in the architectural promenade as well as the physical coordinates of the building itself.

In Iranian Islamic architecture, movement is defined as a fundamental principle originating from the principle of ontology, eternal movement, and evolution of a physical quality to a spiritual quality (Nejad et al., 2019) (Noghrehkar et al., 2018). Undoubtedly, what is called Islamic art is a combination of face and meaning (Ahmadi, 2019). Pourjafar et al. (2014) define that the culmination of the art of an Iranian architect is moving from the metropolitan scale to the intermediate scale of the area and finally linking it to the scale of a house. This can be achieved by defining and organizing interstitial elements.

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Noghrehkar et. al (2018) believe that considering the social culture governing the Iranian society, the main task of architecture is to observe the hierarchy of confidentiality in the course of moving from the entrance to the interior of a house.

Also, in Islamic Iranian architecture, the way of reaching is often more important than the goal itself. For this reason, the design of a room or a house has not been the goal of an architect in Iranian architecture (Kasraei et al., 2016). The most important goal, however, is to organize the paths and move from the urban scale to the small scale of a house (Ghanaati et al., 2015).

The previous works were limited to analysis only in terms of movement in architecture while the principles of motion and inaction are always meaningful together and they cannot be understood individually. As a result, the authors of this article examined both concepts mentioned together.

To document how Iranian architects created the relationship between the concepts of movement and stagnation, the qualitative research method was used as a suitable and effective method in terms of its dealing with the subjective topic of the elements extracted in the connector spaces of traditional houses.

Furthermore, with a new approach, it aims to redefine these movements and stagnation via a taxonomy in which movement interconnections would be depicted in detail.

Gerring (2004) defines that case study research can extend knowledge by considering what is already known through previous examples, enabling detailed descriptions to be provided of specific or even rare cases that the researcher can learn from.

Therefore, this research method does provide a means of obtaining feedback. This type of research also provides flexible means by which to introduce unanticipated and new data and results that can give rise to original directions in the research.

Also, according to Gerring (2004), a case study is "an intensive study of a single unit for understanding a larger class of (similar) units". Studying the existing examples helps to identify how different architectural elements worked to create motion and stagnation, and also facilitate the consideration of what specifications of space in the connector spaces of Iranian traditional houses resulted in specific activities and behaviors that contributed to enhancing the sense of place. Adopting the case study research design also helped with gaining valuable feedback from users.
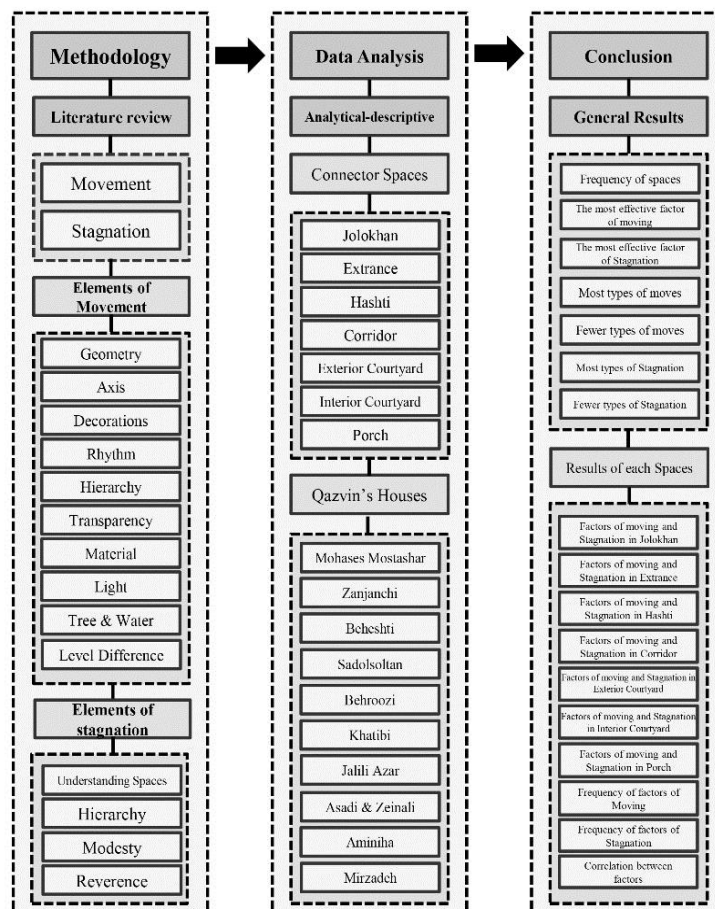

Fig 1. Method and Procedure

Accordingly, the connector spaces of ten traditional houses in Qazvin which were divided into seven sections (Jolokhan, Entrance, Hashti, Corridor, Exterior courtyard, Interior courtyard, and the porch) were chosen as the current study's case study to learn from a realistic example.

Figure 1 shows the methodology used in this study.

2. REVIEW OF THE LITERATURE

2.1. Movement in Architecture

Motion is the principle of all space experiences, and space perception is also motion-dependent (Mahdavinejad & Nagahani, 2011). It is well known that everything in the world is dynamic and evolving with an apparent motion or internal movement (Rahimian, 2004). Movement of the body, if not from five senses, is again a criterion for measuring spaces and objects. Movement in space allows the discovery of hidden beauties (Von Meiss, 2013). Architecture is a three-dimensional artistic meaning that can be integrated into it to understand its details. Time is an irreplaceable element in architecture. Motion is a combination of space and time (Figure 2).

Without the experience of the fourth dimension, space cannot be understood when its details should be fully recognized. For philosophers, the productive movement is the creation of two elements of time and place (Goudarzi & Keshavarz, 2007). In addition to manifestation in space layout, it also is visible in the perfection of any part of a building (Saremi & Radmard, 1998) (Mahdavinejad & Nagahani, 2011).

In other words, from the perspective of Iranian architecture, time is highly interrelated with the space and spatial characters of the architecture.

To understand a more stable subject, a viewer needs to be more active. On the other hand, a viewer needs to be less active to understand a more active subject (Grutter, 1987).

For example, to understand an architectural place, a viewer should move in space, but he/she does not have to move to understand a movie. Different views have been put forward by thinkers about the movement in architecture. For instance, a human being is a moving object in space, whose space is defined only by his motion. Gideon considers man as an observer in space. Schultz deals with the subject more deeply, and he asks the relationship between the man's soul and movement in this regard (Memarian, 2005).

According to these theories, in addition to the apparent perception of space, there is also an esoteric perception of the architectural space that is related to the human psyche. The concept of motion in art is beyond physical definitions. In art, motion is a vehicle for understanding space, and it can be called the flight of soul or departure of the material world and travel to the world of fantasy (Ghanaati et al., 2015). Thus, movement in architecture is placed in two general categories:

1- Physical Movement
2- Semantic Movement.
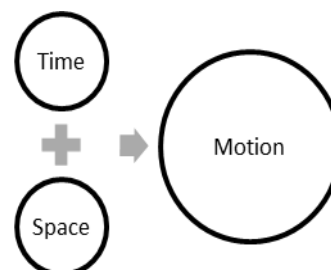
Fig 2. Relationship of Time, Space, and Motion (Source: Rahimian, 2004, p. 146)

2.2. Physical Movement

Undoubtedly, the first movement in architecture seems to be the physical movement. A viewer experiences such a movement in all buildings to understand the architectural environment and different angles in front of his eyes. Physical motion can be divided into two different types:

A- Transportation: The basis of this type of movement is the physical displacement from one point to another point. In this type of movement, the viewer must move from one place to another place and change its physical location to understand space. This movement itself is divided into two types of horizontal and vertical displacements (Ghouchani et al., 2019).

B- Visual Movement: As another type of physical movement, eyes move from one point to another point.

"The movement of the ocular muscles" along with "the projection of movement onto objects" to understand space and its details (Stickells, 2010). When the position of the human eye changes in the path, elements like windows, doors, changes in texture and color, and shapes are important events and any increase or decrease in height and depth is significant, especially when this change is abrupt (Rahimian, 2004).

The eye movements can be divided into four types, vertically or horizontally or rotationally around any element. Human eyes are also capable of free and fluid movement (Mahdavinejad & Nagahani, 2011). Free movement of the eye from form to form and through spaces are provoked. Free movement of the eye is the dominant type of visual movement in observing natural elements (Ahmadi, 2019). In fact, the sum of

the motion and eye movement allows humans to perceive apparent architectural spaces.

On the opposite side of the natural movement of the eye, there is the virtual movement which can be connected to "projected movement" (Ahmadi, 2019). Eyes are deceived by particular patterns creating an illusion of movement. Three factors of physical movement, optical movement, and perceptual movement create the visual experience of movement and perceptual movement. In addition, perceptual movement is defined to be correlated with several factors such as difference in "intensity", "variability" (in size or shape), and "enclosedness" properties of objects which makes one object to be in motion compared to another object (Arnheim, 1957).

As explained by Janson (1991), movement can be expressed succinctly in some polarities such as shadow and light, complexity and simplicity, as well as curvilinear and linear lines which can be observed as a concept in Islamic aesthetics. Therefore, by manipulation in rhythmic geometry, polarity (e.g. shadow and light) and intensified perspective would create a projected movement even sometimes other than the aforementioned, a different factor causes the projection of movement on the form (Ahmadi, 2019). Brady Peters (2001) expressed "motion of the field" as a reaction to the movement of the observer that is referred to as "Parallax" which can be caused by all of the architectural elements or factors related to transporting the observer's body. Thus, to have the "motion of the field" generated, the architect needs to use the same factors of creating projected movement that is well visible in traditional Iranian houses.

movement of a person in space, which is related to physical coordinates but also includes other movements that are associated with mental and sensational coordinates of an explorer in the architectural spaces well as the physical coordinates of the building itself. Obviously, the movement generated in our minds is much more complicated than that in our eyes and bodies. This type of motion creates by evoking the human spirit and senses known. In this study, the term "Semantic Movement" refers to our inner experiences in the architectural space. Pallasmaa (2012) explains that "imagination" and "sensory thoughts" are generated by a collaborative process through our sensory organs. In other words, sensation is the movement of a soul in space.

Besides physical forces that would cause movement in objects, there are some forces in the built form that psychologists call "Psychological Forces". Perceived Forces (Ahmadi, 2019) are perceived psychologically by the explorer and refer to all psychological forces evoked in the observer's mind.

Stickells describes functional circulation as well as narrativized aesthetic experience as the attributes of "architectural promenade" (Stickells, 2010) which is expressed as "a kind of real-world theatrical set" by Lawson (2006). What is obvious is that a narrative created by the spectators' minds could be the same as an exact narrative of the architectural design which the designer has intended (Brittain-Catlin, 2016) or belongs to the self-interpretation of the observer. As explained by Rabie (2014), a narrative is also manifested in Iranian architecture, something that is created everywhere and at all times by employing various arrangements and manifestations.
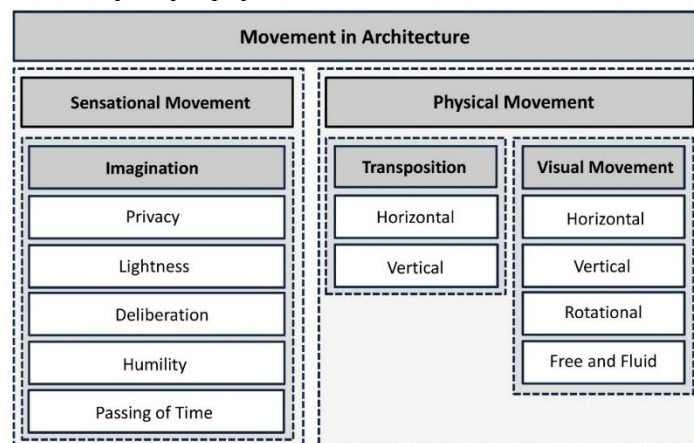
2.3. Semantic Movement

As Plummer's argument (2016), the movements in architecture are not limited only by physical

Fig 3. Category of Movements
(Source: (Ahmadi, 2019) and (Mahdavinejad & Nagahani, 2011))

As explained by Hardy (2011) "evocation of movement through association" plays an important role in the perceiving movement in architecture. In this respect, "Resemblance" in architectural movement can be referred to as the elements of architecture that are reminiscent of a particular occurring object or a creature in motion which can be employed as rhythm in architectural design. Rhythmic subtractions in the form represent a particular occurring object or a creature in motion that causes a connection between that place and specific personal memory.

In a particular place, an explorer might find a connection between place and personal memory which would stimulate the spectator to have a mental time travel. Ahmadi (2019) called this "Conntiqulity" in the architectural association.

Pallasmaa explains an architecture of "sensory experiences". He believes an architecture in which senses like somatosensation and vision could cause body movement (Pallasmaa, 2012). Identically, these senses in addition to olfaction, gustation, and audition can compel various types of movements when they are employed by an architect.

On the other hand, according to the views of Iranian philosophers such as Ghazali, the senses of appearances and inner conscience senses (imagination and thinking) are considered as a movement. From his point of view, imagination is the perception of forms in the soul that occur after seeing something (Bolkharei, 2006). Therefore, from Ghazali's point of view, human imagination is capable of obtaining a universe of goodness and beauty beyond the material universe. With this introduction, one can conclude that entering into the space of architecture creates another movement in the human mind that is the origin of this fantasy with a key role in understanding goodness and beauty.

Therefore, a semantic motion changes the feeling of viewers. This movement is subjective in that transformation takes place in the coordinates of the viewer rather than in the geographical coordinates (Noghrehkar et al., 2018). In this way, it implies a meaning in the minds of observers and constructors. It can be said that this type of movement originates from the sense of a viewer when it comes to understanding space.

The viewer can, in his mind, be influenced by the sensed spatial distribution considering the type of building architecture and experience different feelings such as a post-death life as observed in Egyptian temples or the style of a person when entering a mosque or church, or the sense of hanging in space as an achievement of modern architecture. This type of movement can be accompanied by different emotions and fantasies (Rafiean et al., 2019). As Mahdavinejad and Nagahani (2011) explain, by facing Iranian architectural space, the observer can feel different experiences such as "deliberation" and "humility".

In fact, it occurs in the mind of the viewer. Thus, the architect can move the mind of the viewer to whatever he wants to and move him to the elements that are in his mind by the elements and factors available to him. For example, as Bolkharei (2006) discussed, to create a sense of "privacy" in the space, the entrance is designed complexly, or to create a sense of enthusiasm for the building, the path of movement or the entrance space is designed indirectly.

Privacy in traditional Iranian architecture is included in two types (Moayed & Türker, 2021):

1. the shape of motion from the outside of the house to the inner, and

2. the shape of motion from semi-public common areas of the house to private areas on the next level.

Regarding these notions, senses of "security" and "privacy" can be considered as psychological motivations for one movement from one place to another (Ahmadi, 2019). The feeling of "lightness" or flight is another movement that occurs in the mind and eventually causes different components in the building to create a sense of "passing of time" in the viewer (Mahdavinejad & Nagahani, 2011). This passing can change the age of old buildings with aging materials, seasons with green and yellow leaves of trees, or even the daylight hours by changing the light.

Figure 3 shows a collection of movement categories which is argued by Ahmadi (2019) and Mahdavinejad (2011) (Ahmadi, 2019) and (Mahdavinejad & Nagahani, 2011).

In this study, 'Fiction", "Privacy", "Time Passage", "lightness", 'Deliberation" and "Humility" are counted as the components of sensational movement.

2.4. Stagnation in Architecture

By definition, stagnation means relaxation versus movement. The French equivalent of this word is "Statique", and its synonyms in English are static and immobility. In the philosophical expression of stillness, stagnation means the lack of movement, something that qualifies in motion. In the philosophy of Aristotle, static, fixed, or immovable refers to the first motive that moves the world and does not move (God). He believes that anything in this world can be displaced except by God. In architecture, stillness is the result of the lack of rhythm and motion. The question arising from the concept of stagnation is whether an object has time or not? If an object stays for a few minutes and the eye path is only to that object, then the object is still but is moving if that fixed

object has continuous and moving lines and visual elements (Khan Mohammadi, 2006). This mobility is active for the object. In this case, the object moves, but does not have actual mobility and is still if it can move. Each movement has its resting, in other words, still and motion are meaningful when they are considered together. Motion is, in fact, a change in the state of the beginning and the end of the still.

According to Memarian (2005), a philosopher wants to move to reach the truth, like a drop that connects the sea of truth. A philosophy who considers perfection in reaching a destination rather than understanding the main destination of passing through a series of stages is necessary to finally reach the truth.

Every movement in its essence is still, and stagnation is, in fact, the beginning and end of all movements. This principle is also used in architecture. Space is considered as a pause if a change in motion or mode is applied. In addition to creating space movement and pause, existing arrays between different architectural spaces create spaces for pause and stagnation along the paths by interstitial elements. Depending on the meaning of the Iranian architect and its Islamic worldview, strangeness is evident in different ways. The first stay occurs before the main spaces and calls the observer to a pause to fully understand the sanctity of space and its importance, and causes the arrival of humorous and humiliating. Secondly, the calmness that eventually moves at a certain place awaits the space where the motion stops and the time persists. An example of this discussion is clearly visible in the entrance space of traditional houses, the Hashti element. Stagnation in architecture could be discussed in two parts:

1-Pause space 2- Solitude space

Pause Spaces: we pass between two pause spaces. These spaces play an essential role in creating space hierarchy and also in space sanctity because the observer is invited to stand for a full understanding of space, the decision to guide and eventually move again. A pause and rest after a continuous motion and thought about space will create a kind of sanctity for that space. Karami (2013) defines pause as a technique for troubling routines, a tactical device for a change capable of disturbing established flows.

A pause is an act that disturbs the balance or order of spaces, creating about a moment in which an individual is liberated for an unspecified duration.

Solitude Space: God is the only real purpose of a Muslim's life, and there is no other truth but God. This fact in Islamic thought is vacuity and seclusion (Ahmadi, 2019) where the motion stops and the time persists (Norberg-Schulz, 1980), where to get there has to be gone and should think out in simplicity and stubbornness. Creating an atmosphere suitable for

solitude and thinking has always been an important principle in Iranian architecture. In Islamic mysticism, "quiet" is necessary to reach the ultimate truth, eternal peace, and to drown in the ocean of unity of God (Sattari Raouf & Azimi, 2010). Solitude is also more than being in some inaccessible or remote places. According to Dixon (2009), where human beings have sought solitude have in the end been human-built places.
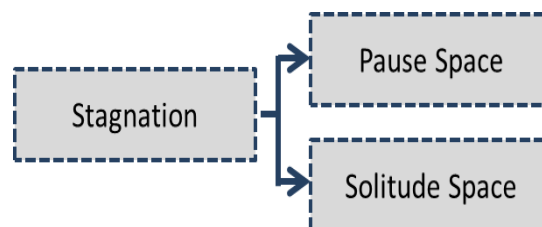

Fig 4. Stagnation Categories

One can observe through that architecture human beings have sought to build solitude, places that are conducive to and encourage solitude. Such spaces include individual hermitages, monasteries, temples, and even cathedrals.

2.5. Elements of Creating Movement and Stagnation in Architecture

There are various elements in architecture for creating movement and stagnation. Islamic architecture chooses elements compatible with its philosophy and insight. For example, complicated arabesque lines and geometric roles end up at the center of the arched vault, and as a result, eyes are fixed to the center of any point in the vault (Nasr, 2010). From the sight of a Muslim architect, the curves of arches, domes, and their geometric properties will have messages such as climbing up or ascending to heaven. These elements include an axis, water, light, pool, corridor, porch, column, arc, dome, minaret, decorations, etc.

As mentioned earlier, every motion has its intrinsic quiescence. Hence, there is a sense of stagnation and motion together. Motion is a change in the state of the beginning and end of the rest. Consequently, these two concepts are mutually exclusive in both of these factors.

Both physical and semantic motions and stagnation can enhance stagnation and movement. Each of these factors can be created in the architecture depending on the type of architecture:

Geometry: Geometry and form play an important role in creating the meaning of movement, some forms have intrinsic motions while others are static. Bavandian (2004) explains an Iranian Muslim

architect tries to bring his result to the most transcendental and most balanced form to eliminate imperfections and flaws. He is called to pure, specific, and precise geometry by paying attention to the regularity and constant observance of proportionality. In his view, geometry is something between materials and meaning, the earth and the sky, and quiet and motion.

The line is created from the continuous movement of a point, and a surface is the result of the continuous movement of a line. Therefore, these elements reflect the meaning of motion in their essence. According to the particular hypothesis of this research (Antoniades, 1990), "the geometry is a repetition or motion of a modulus or repeating of a component".

Hierarchy: Rabie (2014) argues that "sequence, hierarchy, and various private sanctums" are key factors in the Iranian-Islamic narrative and thus in movement. Absolute value elements are rarely found together in architecture. The difference in elements placed next to each other creates a visual or spiritual (symbolic value of an element) hierarchy. Grütter (1987) explains that the visual hierarchy is also used to emphasize the hierarchy of spirituality. Therefore, this visual factor can create a sense of motion or an eye movement. Ardalan et al. (1974) believe that the geometry of the Iranian architectural index represents movement implying the regular repetition of features, elements, and phenomena.

Shayan and Gharipour (2004) refer to the sequence of spaces that originates from this belief that understanding and feeling in a continuous path of growth and preparation are made to reach witness in the course of a historical space until reaching the destination. Sattari Raouf and Azimi (2010) note that the path of movement from a metropolitan (public areas) to a residential home (private areas) is always designed by intermediate elements that define semi-private and semi-public areas under a specific hierarchy. Moving from the urban scale to the small scale takes place through the principle of semantic hierarchy.

Mohammadian (2007) counts various aspects of the hierarchy of form, functional hierarchy, spatial hierarchy, visual hierarchy, and other aspects that are clearly identifiable in traditional houses. Opening and closing spaces as well as the level of difference in space are among the factors involved in creating a hierarchy and emergence of motion and rest in the architecture.

As Grütter (1987) expresses, the main features of the interstitial spaces include the creation of motion and fluidity on a small scale and the creation of the principle of continuity and hierarchy. The sequential steps can be considered as means for measuring them. This type of organization increases mobility as a result of dynamic induction.
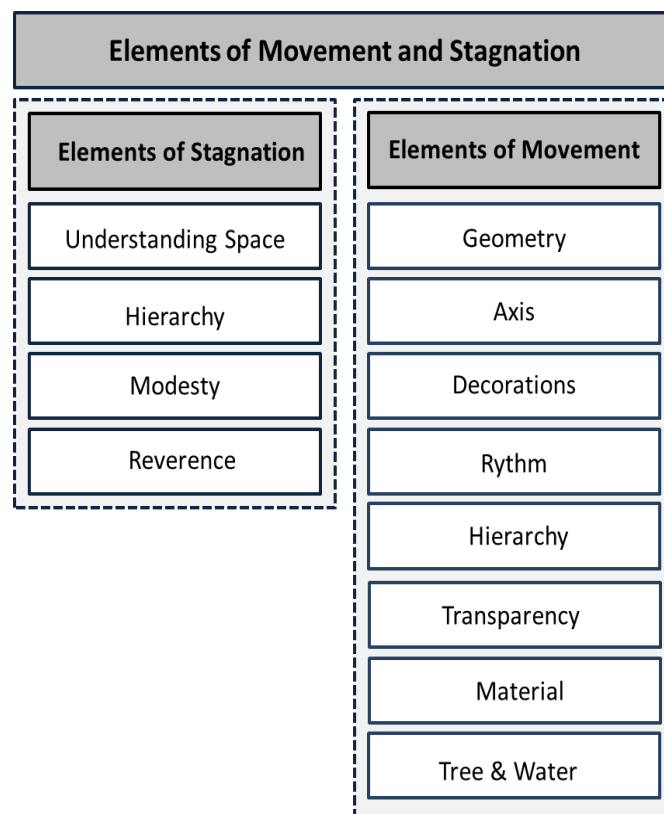
Fig 5. Architectural Elements and Movement and Stagnation Factors

Rhythm: One of the architectural factor factors that contains movement is rhythm. In art, rhythm is a simple and connected path, where the eye follows its various types of lines, shapes, or colors (Rahimian, 2004). Therefore, rhythm is related to motion, and regular repetition of an element is the simplest method for an architect. According to Laseau (2000), in architecture rhythm matches the components together. The characteristics of visual rhythms in a building depend on the length of interruptions and components.

Factors creating the rhythm in Iranian architecture are the scale, modulus, proportions, repetition, articulation, the order in the establishment, color, and finally, and the movement of light and shadow. With the help of space ratios, architects can create a kind of mobility to induce movement to the viewer and draw his attention to move in a certain direction. The element of rhythm has been used frequently in traditional Iranian architecture. Grütter (1987) argues that the rhythm, either horizontally or vertically, causes displacement while creating horizontal and vertical eye movements. The path division (rhythm) causes a permanent look to the left and right along the path and causes the viewer to pause.

Transparency and Visual Communication: Estremadoyro (2003) counts "continuity, sequence, and flow" as the factors promoting a movement that in the architectural language could be considered transparency.

As Diba (1999) states, the concept of transparency and continuity is opposite to that of a closed space. In such spaces, the path of human movement or its view in continuous continuity is in such a way that the spatial opening in the horizontal and vertical lines gives transparency in the layer of walls and columns. Ching (2014) refers that any opening established between two spaces may create visual communication, and the type of visibility will be determined by the size and location of openings. Grütter (1987) believes that the size of an open space or a building is determined by its relationship with the adjacent space in addition to the effect on guiding the look. It can also be effective on the physical guidance of viewers.

Transparency stems from an essential principle of ontology, that is, the movement of the eternal and evolution of being from material quality to spiritual quality. The embodiment of this principle in the history of Iranian architecture is the cause of the permanent and evolutionary development of material reduction and increased space. On the other hand, a clear space is opposite to an open space where the movement of a man or his perspective is continuous. According to Shayan and Gharipour (2004), the presence of the intermediate space of the porch is one

of the manifestations of transparency and continuity in Iranian architecture.

Axis: Ching (2014) counts approach, axis, circulation space, path, linear, and radial geometry as the architectural elements and factors which contain movement or would stimulate it.

Von Meiss (2013) believes that the path is always a change in thought of a human. The location and center are the appearances of tranquility, and movement represents, in fact, a change in location over time. Each movement needs a route, and each route represents a direction. The axes represent the directions and connect elements. Since each axis has necessarily a linear position, it also has the characteristics of the length and direction and causes the movement and sight of the human being along its path. Grütter (1987) refers that the sense of visual perception also has an orientation for humans. This is why it is one of the most important factors in architectural design.

Level Difference: While the act of traversing up a stairway may convey privacy, aloofness, or detachment, the process of going down can imply moving toward secure, protected, or stable ground.

In architecture, ground or floor separation is often used to define a sphere in space or a larger environment (Ching, 2014). The presence of level differences may attract the attention of the viewer. In such a case, the viewer performs vertical motion by vertical correlation factors or is encouraged by horizontal variation of the surface. The level difference is placed in the geometry category.

Light: Ching (2014) explains light as an architectural element that motivates the visitor to move towards it.

Light creates a distinct surface. Light can be used not only to incite differentiations but also to show distinctions and distances. Dibaj (2005) defines that light is not the only builder of space, but also is the transformer of space. On the other hand, the use of porous surfaces and artistic shades in Iranian architecture makes a sense of lightness (semantic motion). Moving is a vehicle for understanding space. The existence of Iranian architecture and understanding its space owe to the movement. A movement may have certain forms but has a root in essence. Light creates a sense of motion in a space by creating dynamism and fluidity. Light inherently has the property of motion and difference. It plays a major role in the definition of hierarchy and rhythm, and ultimately the association of motion towards the purpose of space. The movement spaces are quite dark, the yard is quite bright, and the space is moving and active. The porch is in shadow, and the semi-dynamic and semi-stationary space is used for

temporary stagnation, and eventually, the room is a beautiful space of the combination of colored lights at the end of the path. In this process, the dynamics of light space and motion in an opposite system act in such a way that it moves more rapidly in dark spaces. In contrast, it tends to encourage perseverance and pause in bright spaces (Sattari Raouf & Azimi, 2010). This can be seen in the Hashti and corridors.

Material and Decoration: Mahdavinejad and Nagahani (2011) consider the age of old buildings by aging materials as a factor for inducing visitors to trip in time. The explorer's mind can feel this movement in certain situations created by being in the built space and passage time.

Tree and Water: Water has a prominent role in forming architecture, specifically in traditional Iranian architecture. Springs, pools, streams, and other water-related architectural elements create an altering space dominated by natural light in the space and display movement.

Ahmadi (2019) believes that using water decelerates and ultimately stops the circulatory movement of explorers by giving them a sense of peace. Further, the circulation of the water provides a chance to stimulate other types of movement.

In addition, natural light and water together by changing color and direction during the day, can transform the space and give the sense of time passage.

All these elements can be applied in all forms of motion or in several variants. For example, the axis can cause a directional physical movement, and water can exacerbate this movement. Light can create a shadow and cause rhythm and eye movement. Semantic motion can be observed in different types of Islamic buildings depending on their functions. Iranian architects, for this purpose, considered the principles of entering and facing the building to influence the feelings of viewers and create a movement of imagination in them. For example, the hierarchy is one of the important factors in entering Islamic architectural spaces. The path of the entrance space is designed indirectly and screwed in such a way that it is impossible to observe interior spaces in front of the Hashti. Entering with modesty is one of the architectural ideas of such architectural monuments so that viewers find the necessary mental readiness to enter the space. In this case, the route is usually designed indirectly or as far as possible. This path is designed with a change in the scale and light for a certain goal. Notably, these factors were used to get the material needs of the building and also to achieve a spiritual sense.

In Iranian houses, coming from outside to the darkness of the corridor and then to lighting in the courtyard, and seeing that small paradise can be a rebellious companion to the viewer again.
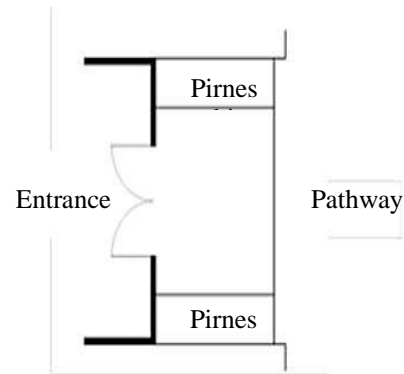
Fig 6. Pathway, Pirneshin, and Entrance
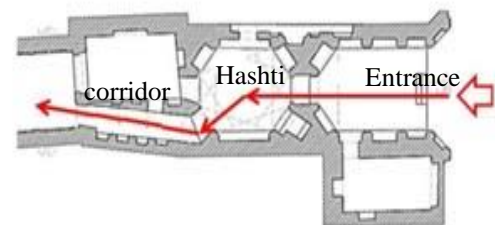
Fig 7. Entrance, Hashti, and Corridor

As already noted, various factors and architectural elements might work together to motivate certain types of movement. Therefore, a single ramp can motivate and manifest various types of movements, as other factors and architectural elements can do the same.

Elements of Stagnation: In this research, 4 elements that cause stagnation including understanding space, hierarchy, modesty, and reverence.

As previously mentioned, pause spaces give the observer this opportunity to stop for a full understanding of space, the decision to guide and eventually move again. So, understanding space could be considered as an element to create a pause.

A pause and rest after a continuous motion and thought about space will create a kind of sanctity for that space which is considered reverence.

Hierarchy is nothing more than a pause before entering a space so motion and stagnation together cause the creation of a spatial hierarchy. Therefore, hierarchy in this research is considered an element for causing motion and stagnation.

In some places, the experience of grandeur of the architectural space forces the viewer to pause and create a sense of modesty. Figure 5 shows the elements for the creation of movement and stagnation.

Table 1. Selected Houses and their Connector Spaces

Row	Houses' Name	Connector Spaces						
		Jolokhan	Entrance	Corridor	*Hashti*	Exterior Courtyard	Interior Courtyard	Porch
1	Mohases mostashar's house	+	+	+	+	-	+	-
2	Zanjanchi's house	-	+	-	+	-	+	+
3	Beheshti's house	-	+	+	+	+	+	-
4	Sadolsoltan's house	-	+	+	+	+	+	-
5	Behrozi's house	-	+	-	-	+	+	+
6	Khatibi's house	-	+	+	+	+	+	+
7	Jalil azari's house	-	+	+	-	-	+	+
8	Asadi & Zeinali's house	-	+	+	+	+	+	-
9	Aminiha's house	-	+	+	-	-	+	-
10	Mirianzadeh's house	-	+	+	-	-	+	-

2.7. The Connector Spaces ϖn The Iranian Traditional House:

The culmination of the art of an Iranian architect is in moving from the metropolitan scale to the intermediate scale of the site and eventually linking it to the scale of a house, which is accomplished by the arrangement and the hierarchy of space. In this study, suitable connector spaces include Jolokhan, entrance, Hashti, corridor, exterior courtyard, interior courtyard, and porch.

Jolokhan and entrance are the factors of the small-scale relationship of the house with the public outside (middle-scale), which is usually opened into close alleys that form semi-public areas. Hashti is one of the most important elements of traditional Iranian houses. It defines the private area. In this space, the movement from outside to inside becomes stagnant and the observer is stopped for a few moments and forced to think and decide. Hashti is usually located at an angle to the courtyard and links with the courtyard. The courtyard is a private area but ends in the course of moving to the interior of the house. With the imposition of sovereign sanctities and territories in this course of movement, no space breakdown occurs and the fluidity of the space continues.

Entrance: The entrance of the traditional houses is a connecting space that connects the pathway to the house. The wall of the house is located on the two sides at the entrance, which leaves the waiting person away from the traffic flow through the alley. There are two platforms in the hollow section called "Pirneshin" (Figure 6). In this way, one can rest at the entrance without entering the house. This retreat (changing geometry) and the platform for sitting actually cause a pause.

Hashti: At the entrance to the house, viewers are facing a pause space. The entrance space in comparison with the pathway is darker and cooler. Hashti is a space located at the entrance like a room behind the door which allows the connection between the outside and inside. Hasht is, in fact, an independent and complete space.

Corridor: Corridor (Dallan) in architecture is so important that it can be considered as the main essence of architectural spaces, which gradually leads to breaking through and joining as shown in Figure 7. A corridor is a passageway, so there is usually a dark space where a bright light at the beginning and end of the path always invites the observer to walk the path and reach the light.

Courtyard: The traditional architecture of Iran has been formed based on the courtyard. These greenery courtyard

spaces could be located around a porch. In most traditional houses, porches are used as the main elements in one or more

views. Porches are valuable elements in terms of size, form, and even decoration. Northern porches are cold in hot weather and create a flow of cold breeze toward interior spaces. Southern porches (facing the sun) are used throughout the year. Given the skewed sunlight, southern porches reduce the penetration of

solar rays into interior spaces (Baker & Steemers, 2014).
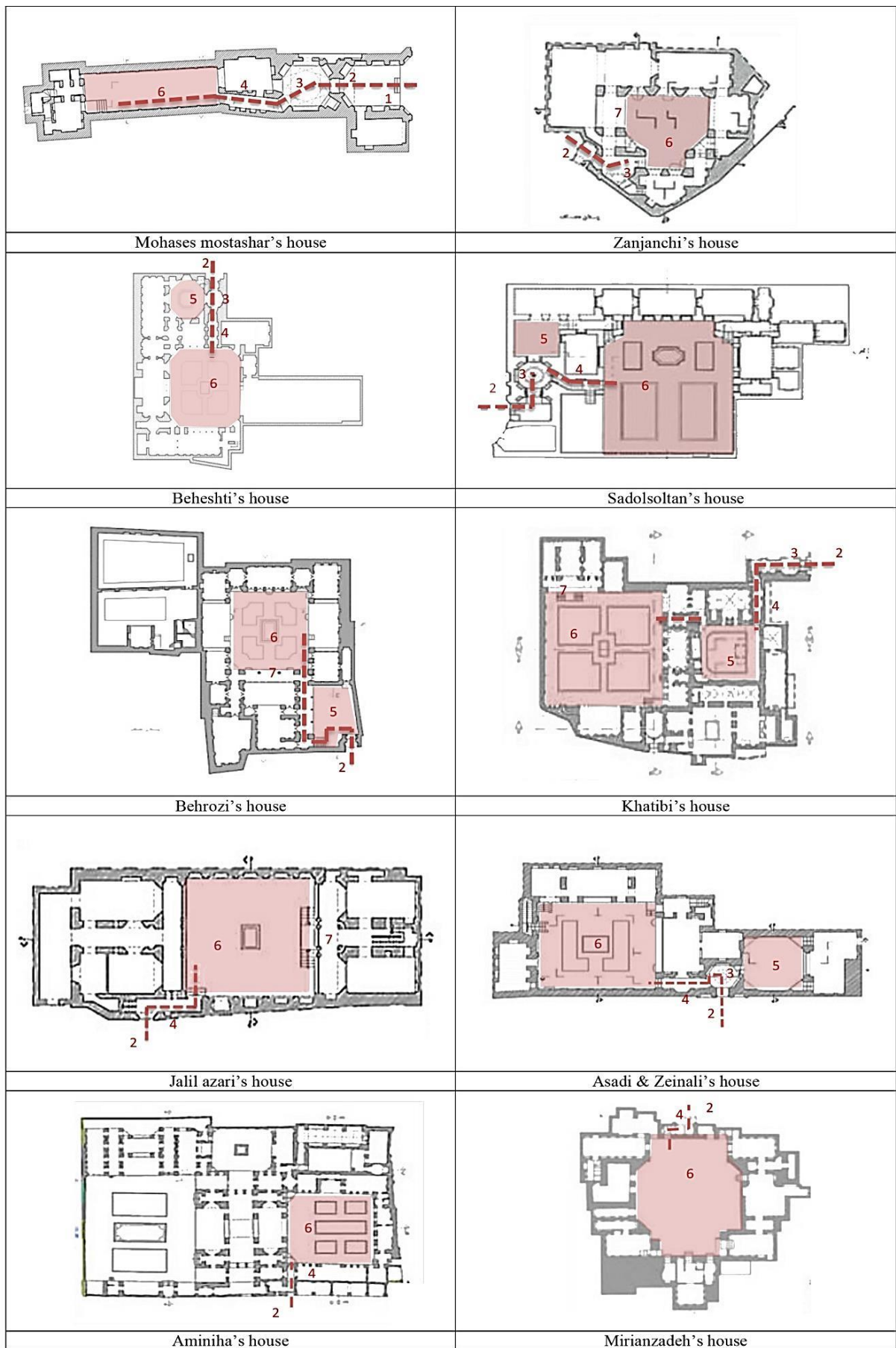
3. RESULTS

The concept of movement and stagnation in traditional houses of Qazvin is analyzed in two sections. Ten traditional houses in Qazvin, which have at least three communication spaces from the seven studied communication spaces (Jolokham, entrance, Hashti, corridors, interior courtyard, exterior courtyard, and porch), are selected. The communication spaces in these 10 houses are shown in Table 1. Figure 8 shows the plans of the examined houses.

3.1 Review Results of Movement

As previously mentioned, motion is generally divided into two types of physical and non-physical movements. Physical movement is itself divided into two groups of moving and eye movement. In this research, 10 factors of movements were investigated and the results were analyzed in a comparative way. Therefore, a qualitative-quantitative table is drawn to estimate and assess movement in architecture (Table 2).

Table 2. The Table of Movement Evaluation in Connector Spaces

Types of Movement / Name of House	Physical Movement						Sensational Movement						Frequency of Movement
	Moving (Horizontal)	Moving (Vertical)	Eye Movement (Horizontal)	Eye Movement (Vertical)	Eye Movement (Rotational)	Eye Movement (Fluid)	Feeling (Fiction)	Feeling (Privacy)	Feeling (Lightness)	Feeling (Deliberation)	Feeling (Humility)	Feeling (Passing of Time)	
Mohases Mostashar's House													
Zanjanchi's House													
Beheshti's House													
Sadolsoltan's House													
Behrozi's House													
Khatibi's House													
Jalili Azar's House													
Asadi & Zeinali's House													
Aminiha's House													
Mirzadeh's House													

Elements of Movement

○ Geometry	□ Axis	△ Decorations	⊖ Rhythm	⬘ Transparency
⬦ Material	⬘ Light	⬚ Tree & Water	▯ Level Difference	⊟ Hierarchy

Fig 8. Ten Selected Traditional Houses in Qazvin and their Connector Spaces

Table 3. Types of Movement in Jolokhan

Types of Movement in Jolokhan / Name of House	Physical Movement							Sensational Movement							Frequency of Movement
	Moving (Horizontal)	Moving (Vertical)	Eye Movement (Horizontal)	Eye Movement (Vertical)	Eye Movement (Rotational)	Eye Movement (Fluid)	Feeling (Fiction)	Feeling (Privacy)	Feeling (Lightness)	Feeling (Deliberation)	Feeling (Humility)	Feeling (Passing of Time)			
Mohases Mostashar's House	□ ○	▯	△ ⊖ □	△ ○ ▲			⊟ ▲	⊟ ▯ △		⊟		Φ △			0.75
Zanjanchi's House															
Beheshti's House															
Sadolsoltan's House															
Behrozi's House															
Khatibi's House															
Jalili Azar's House															
Asadi & Zeinali's House															
Aminiha's House															
Mirzadeh's House															

Elements of Movement

○ Geometry □ Axis △ Decorations ⊖ Rhythm ▲ Transparency
Φ Material ▲ Light ▯ Tree & Water ▯ Level Difference ⊟ Hierarchy

Table 4. Types of Movement in Entrance

Types of Movement in Entrance / Name of House	Physical Movement							Sensational Movement							Frequency of Movement
	Moving (Horizontal)	Moving (Vertical)	Eye Movement (Horizontal)	Eye Movement (Vertical)	Eye Movement (Rotational)	Eye Movement (Fluid)	Feeling (Fiction)	Feeling (Privacy)	Feeling (Lightness)	Feeling (Deliberation)	Feeling (Humility)	Feeling (Passing of Time)			
Mohases Mostashar's House	○ □		○ △	○ △ ▲ ▯		△	⊟	○ ⊟ ○		⊟	○	Φ △			0.83
Zanjanchi's House	○		○	○			⊟	○ ⊟		⊟	○	Φ △			0.66
Beheshti's House	○		○	○ △			⊟	○ ⊟		⊟	○	Φ △			0.66
Sadolsoltan's House	○		△	○ △			⊟	○ ⊟		⊟	○	Φ △			0.66
Behrozi's House	○	▯		△			⊟	▯ ⊟		⊟	○ ▯ Φ △				0.66
Khatibi's House	○	▯		△ ○			⊟	⊟		⊟	○ ▯ Φ △				0.66
Jalili Azar's House	○			○ △			⊟	○ ⊟		⊟	○	Φ △			0.50
Asadi & Zeinali's House			○ △ ○ △				⊟	○ ⊟		⊟	○	Φ △			0.58
Aminiha's House							⊟	⊟		⊟	○	Φ △			0.41
Mirzadeh's House	○	▯	○ △ ○ △				⊟	○ ⊟		⊟	▯	Φ △			0.75

Elements of Movement

○ Geometry □ Axis △ Decorations ⊖ Rhythm ▲ Transparency
Φ Material ▲ Light ▯ Tree & Water ▯ Level Difference ⊟ Hierarchy

Table 5. Types of Movement in Hashti

Types of Movement in Hashti / Name of House	Physical Movement						Sensational Movement						Frequency of Movement
	Moving (Horizontal)	Moving (Vertical)	Eye Movement (Horizontal)	Eye Movement (Vertical)	Eye Movement (Rotational)	Eye Movement (Fluid)	Feeling (Fiction)	Feeling (Privacy)	Feeling (Lightness)	Feeling (Deliberation)	Feeling (Humility)	Feeling (Passing of Time)	
Mohases Mostashar's House	⚲ ⬜	⬜	⊖ △ ⬜	○ ⬜ △	○ ⊖ △		⊞	⊞ ⬜ △		⊞	⬜	⬤ △	0.91
Zanjanchi's House	⚲	⬜ ⬜	⚲				⊞	⊞ ⬜		⊞	⬜ ⬜	⬤	0.66
Beheshti's House	⚲ ⬜		⊖ ⚲ △ ⬜	○ △	○		⊞	⊞	△	⊞		⬤ △	0.75
Sadolsoltan's House	⚲ ⬜	⬜	⊖ △ ⚲ ⬜	○ ⬜ △	○ ⊖ △		⊞	⊞ ⬜ △		⊞	⬜	⬤ △	0.91
Behrozi's House	/////												
Khatibi's House	⬜	⬜	○ ⊖ ○ △	○ △	○ ⊖		⊞	⊞ ⬜		⊞	⬜	⬤ △	0.83
Jalili Azar's House	/////												
Asadi & Zeinali's House	⚲ ⬜		⊖ ○ ⚲ ⬜	○ △	○ ⊖ △		⊞	⊞	△	⊞		⬤ △	0.75
Aminiha's House	/////												
Mirzadeh's House	/////												

Elements of Movement

○ Geometry   ⬜ Axis   △ Decorations   ⊖ Rhythm   ⬘ Transparency
⬤ Material   ⚲ Light   ⬒ Tree & Water   ⬜ Level Difference   ⊞ Hierarchy

Table 6. Types of Movement in Corridor

Types of Movement in Corridor / Name of House	Physical Movement						Sensational Movement						Frequency of Movement
	Moving (Horizontal)	Moving (Vertical)	Eye Movement (Horizontal)	Eye Movement (Vertical)	Eye Movement (Rotational)	Eye Movement (Fluid)	Feeling (Fiction)	Feeling (Privacy)	Feeling (Lightness)	Feeling (Deliberation)	Feeling (Humility)	Feeling (Passing of Time)	
Mohases Mostashar's House	⚲ ⬜ ⊖ ○		⊖ ⚲				⊞	⊞		⊞		⬤	0.50
Zanjanchi's House	/////												
Beheshti's House	⚲ ⬜ ⊖ ○		⊖ ⚲				⊞	⊞		⊞		⬤	0.50
Sadolsoltan's House	⚲ ⬜ ⊖ ○		⊖ ⚲				⊞	⊞		⊞		⬤	0.50
Behrozi's House	/////												
Khatibi's House	⚲ ⬜ ⊖ ○		⊖ ⚲				⊞	⊞		⊞		⬤	0.50
Jalili Azar's House	⚲ ⬜ ○		⚲				⊞	⊞		⊞		⬤	0.50
Asadi & Zeinali's House	⚲ ⬜ ⊖ ○		⚲				⊞	⊞		⊞		⬤	0.50
Aminiha's House	⚲ ⬜ ○		⚲				⊞	⊞		⊞		⬤	0.50
Mirzadeh's House	⚲ ⬜ ○		⚲				⊞	⊞		⊞		⬤	0.50

Elements of Movement

○ Geometry   ⬜ Axis   △ Decorations   ⊖ Rhythm   ⬘ Transparency
⬤ Material   ⚲ Light   ⬒ Tree & Water   ⬜ Level Difference   ⊞ Hierarchy

The table assessing the movement for connector spaces in Iranian traditional houses is presented in Table 3-10. It is clear that the results would be more specific by applying a scale to the table through a questionnaire inquiry, like the Likert scale. However, the tables have been filled by the authors. It thus expresses the researcher's own observations and experiences. Every table is filled for one of the 7 examined connector spaces. Every sign (listed at the bottom of the tables) placed at each cell represents an element of movement which creates a certain movement (listed at the of the tables). For example, eye horizontal movement in Hashti of Beheshti's house (column 3 row 3 in Table 5), appears to be stimulated by rhythm, light, decoration, and axis. Therefore, signs are placed at each one of the correspondent cells. Finally, the last column of the table represents the frequency of movement obtained in each row (each space in each house) which gives us certain values of some movements.

Nevertheless, the 10 houses are similar in terms of the total score of frequency of movement in the corridor, interior courtyard, and porch. Also, it is noteworthy that frequency of movement (physical and sensational movement) scores highest in the interior courtyard by the rate of 0.91, while the lowest score belongs to the corridor by the rate of 0.50 because, in this space, sensational movement and eye movement were less considered than horizontal movement (Tables 3-10).

The comparison of the tables shown in Tables 3-10 express that physical and sensational movements score the lowest in the main entrance of Aminiha's house by the rate of 0.41 compared to the other connector spaces (Table 4).

Table 11 shows the percentage of causative elements in all 44 spaces to create physical and sensational movement, and the frequency of movement types (in the last row) using the numerical values extracted from respective filled tables (Tables 3-9).

According to Table 11, geometry and axis have the greatest effect (81.8% and 65.9%) on horizontal moving which exists in 95.4% of all spaces. The only cause of vertical moving is the level difference which was present in 52.2% of the spaces. Eye movement in connector spaces has been more horizontal and vertical (81.8% and 86.3%), which are mostly caused by rhythm and decoration (54.5% and 52.5%). In addition, in all 44 spaces examined, there is a sense of fiction, privacy, and deliberation created by the hierarchy, and the presence of old materials makes a sense of the passing of time.

Figure 9 shows that the most movement (horizontal and vertical) happens in Jolokhan, interior courtyards, and exterior courtyards. While the lowest movement occurs in the corridor and porch because there is no vertical movement in these places.

On the other hand, the most eye movement takes place in interior courtyards and the lowest amount is related to the corridor.

According to Figure 9, the most sensational movement can be seen on the porch and the least on the corridor.

3.2. Review Rresults of Stagnation

As previously mentioned, stagnation in architectural spaces is generally divided into two types: pause space and solitude space. In this research, 4 elements that cause stagnation include understanding space, hierarchy, modesty, and reverence.

Table 12 represents the results of assessing the stagnation for connector spaces in Iranian traditional houses. This table has been filled by the authors. It thus expresses the researcher's own observations and experiences.

Every cell is filled for one of two stagnation types in 7 examined connector spaces. Every sign (listed at the bottom of the tables) placed at each cell represents an element of stagnation which creates a pause space or solitude space (listed at the top of the tables). For example, in the Hashti of Beheshti's house (column 5 row 3 in Table 12), pause space is created by understanding space, hierarchy, and reverence.

According to Table 12, in all spaces examined except the corridor, the sense of a pause space was mostly created by hierarchy, reverence, and understanding space. Whereas, in 7 of 10 Hashtis examined, modestly is also considered as an element of stagnation.

In addition, as expected, none of the connector spaces examined can be considered as a solitude space.

3.3. Review Rresults of the Position of the Viewer and the Viewpoint

Another case that has been studied in this paper is the ratio of position of the viewer and viewpoint in 7 defined connector spaces. For this purpose, 4 modes are defined as follows: 1) both the viewer and the viewpoint are animated, 2) the viewer is fixed but the viewpoint is animated, 3) the viewer is animated

while the viewpoint is fixed, and 4) both the viewer and viewpoint are fixed. (Table13).

This table is filled for one of the 7 examined connector spaces. Every sign (listed at the bottom of the tables) placed at each cell represents an element of movement which shows 4 different ratios of the position of the viewer and the viewpoint (listed at the bottom of the table). For example, in the Hashti of Beheshti's house (column 8 row 3 in Table 13), due to the centralized geometry of this space, the viewer is fixed but the viewpoint is animated. While in the corridor of this house, both the viewer and the viewpoint are animated.

Therefore, signs defined were placed at each one of the correspondent cells.

According to Table 13, in Jolokhan, Hasti, and, porch the viewer is fixed but the viewpoint is animated, and in the corridor, this result is the opposite, the viewer is animated whereas the viewpoint is fixed. While in interior and exterior courtyards, both the viewer and the viewpoint are animated.

Overall, the results indicated that motion and stagnation are two main important factors in the design of the connector spaces in Iranian traditional houses. These two factors have been used by architects to create spatial and perceptual hierarchies. The principles of motion and inaction are always meaningful together and they cannot be understood individually. We cannot define movement without the experience of stillness. Therefore, the viewer, along with the feeling of movement, will understand stagnation and vice versa.

Table 7. Types of movement in Exterior Courtyard

Table 8. Types of Movement in Interior Courtyard

Types of Movement in Interior Courtyard / Name of House	Physical Movement — Moving (Horizontal)	Moving (Vertical)	Eye Movement (Horizontal)	Eye Movement (Vertical)	Eye Movement (Rotational)	Eye Movement (Fluid)	Sensational Movement — Feeling (Fiction)	Feeling (Privacy)	Feeling (Lightness)	Feeling (Deliberation)	Feeling (Humility)	Feeling (Passing of Time)	Frequency of Movement
Mohases Mostashar's House													0.91
Zanjanchi's House													0.91
Beheshti's House													0.91
Sadolsoltan's House													0.91
Behrozi's House													0.91
Khatibi's House													0.91
Jalili Azar's House													0.91
Asadi & Zeinali's House													0.91
Aminiha's House													0.91
Mirzadeh's House													0.91

Elements of Movement

- ○ Geometry
- □ Axis
- △ Decorations
- ⊖ Rhythm
- ⬟ Transparency
- ⬦ Material
- ⬠ Light
- ⬚ Tree & Water
- ▯ Level Difference
- ⊟ Hierarchy

Table 9. Types of Movement in Porch Spaces

Types of Movement in Porch / Name of House	Physical Movement — Moving (Horizontal)	Moving (Vertical)	Eye Movement (Horizontal)	Eye Movement (Vertical)	Eye Movement (Rotational)	Eye Movement (Fluid)	Sensational Movement — Feeling (Fiction)	Feeling (Privacy)	Feeling (Lightness)	Feeling (Deliberation)	Feeling (Humility)	Feeling (Passing of Time)	Frequency of Movement
Mohases Mostashar's House													
Zanjanchi's House													0.75
Beheshti's House													
Sadolsoltan's House													
Behrozi's House													0.75
Khatibi's House													0.75
Jalili Azar's House													0.75
Asadi & Zeinali's House													
Aminiha's House													
Mirzadeh's House													

Elements of Movement

- ○ Geometry
- □ Axis
- △ Decorations
- ⊖ Rhythm
- ⬟ Transparency
- ⬦ Material
- ⬠ Light
- ⬚ Tree & Water
- ▯ Level Difference
- ⊟ Hierarchy

Table 10. Types of Movement in all of the Spaces

Types of Movement in all of the spaces — Name of House	Physical Movement							Sensational Movement							
	Moving (Horizontal)	Moving (Vertical)	Eye Movement (Horizontal)	Eye Movement (Vertical)	Eye Movement (Rotational)	Eye Movement (Fluid)		Feeling (Fiction)	Feeling (Privacy)	Feeling (Lightness)	Feeling (Deliberation)	Feeling (Humility)	Feeling (Passing of Time)		
Mohases Mostashar's House															
Zanjanchi's House															
Beheshti's House															
Sadolsoltan's House															
Behrozi's House															
Khatibi's House															
Jalili Azar's House															
Asadi & Zeinali's House															
Aminiha's House															
Mirzadeh's House															

Elements of Movement

- O Geometry
- □ Axis
- △ Decorations
- ⊖ Rhythm
- ⬙ Transparency
- Φ Material
- ⚠ Light
- ⊞ Tree & Water
- ▯ Level Difference
- ⊟ Hierarchy

Fig 9. The frequency of types of movements in 7 connector spaces

Connector Spaces (x-axis): Jolokhan, Entrance, Corridor, Hashti, Exterior Courtyard, Interior Courtyard, Porch

Frequency (y-axis): 0–100

Legend:
- frequency of movement (Eye movement)
- frequency of movement (moving)
- frequency of movement (feeling)

For instance, at the entrance of houses, the stagnation becomes meaningful alongside the physical movement of the eye and the non-physical movement (sensational movement) that provides an opportunity for understanding the environment. Due to centric geometry in Hashti, the speed of the viewer is reduced and stagnation occurs to understand the environment and determine the direction of movement. This in turn increases the motion of eyes and non-physical movements.

In addition, the darkness and tallness of space (geometry), as well as the lack of decorations in the corridor (Dallan) increase the horizontal moving of the viewer toward the brightness at the end of the pathway.

Half of the samples had an exterior courtyard, of which 83% were been with Hashti. The exterior courtyard is an area that divides the building into interior and exterior parts. After passing through the fairly dark space of Hashti, the brightness of this space leads to a pause for understanding the space, and the viewer waits to get permission to enter the reception space for guests, which includes one or more rooms.

In 90% of the cases, after passing through the Hashti and corridor, the viewer reaches the interior courtyard, which residential areas of the house are located around its surrounding.

When entering the inner courtyard, the viewer needs to pause and stay to understand the space, as well as to identify the axis of movement. The existence of trees and ponds in the interior space creates both physical and sensational movements. Moreover, the centric geometry and arrangement of spaces around the yard lead to eye movement.

The ultimate space is the porch (Iwan), which is the intersection of the interior space and the interior courtyard. While creating a hierarchy of light, it also creates a hierarchy of motion while the axis of this space creates a physical movement. The transparency of the porch causes eye movement and sensational movement.

Table 11. Frequency of movement types and the percentage of causative elements

Movement / Elements of Movement	Physical Movement						Sensational Movement					
	Moving (Horizontal)	Moving (Vertical)	Eye Movement (Horizontal)	Eye Movement (Vertical)	Eye Movement (Rotational)	Eye Movement (Fluid)	Feeling (Fiction)	Feeling (Privacy)	Feeling (Lightness)	Feeling (Deliberation)	Feeling (Humility)	Feeling (Passing of Time)
○ Geometry	81.8%	0.00%	15.9%	31.8%	36.6%	0.00%	0.00%	15.9%	22.7%	0.00%	20.4%	0.00%
□ Axis	65.9%	0.00%	20.4%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
△ Decorations	0.00%	0.00%	34.0%	52.2%	34.0%	2.27%	0.00%	0.00%	11.3%	0.00%	0.00%	79.5%
⊖ Rhythm	11.3%	0.00%	54.5%	0.00%	34.0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
⊞ Hierarchy	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100%	100%	0.00%	100%	0.00%	0.00%
△ Transparency	0.00%	0.00%	0.00%	2.27%	0.00%	40.9%	34.0%	0.00%	15.9%	31.8%	0.00%	0.00%
φ Material	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100%
⊡ Tree & Water	0.00%	0.00%	0.00%	0.00%	0.00%	29.5%	0.00%	0.00%	27.2%	0.00%	0.00%	29.5%
△ Light	29.5%	0.00%	25.0%	0.00%	0.00%	0.00%	0.00%	0.00%	43.1%	0.00%	0.00%	43.1%
▯ Level Difference	0.00%	52.2%	0.00%	40.9%	0.00%	0.00%	0.00%	22.7%	0.00%	0.00%	25.0%	0.00%
Total (in 44 spaces)	95.4%	52.2%	81.8%	86.3%	38.6%	43.1%	100%	100%	56.8%	100%	40.9%	100%

Table 12. The Stagnation for Connector Spaces

Table 13. The Ratio of the Position of the Viewer and the Viewpoint

4. CONCLUSION

Overall, the results show that attempts have been made to create the idea of movement and stagnation in connector spaces of Iranian traditional houses. The Iranian-Islamic architects have used different elements to persuade viewers to move or stay. In someplace like corridors, elements such as geometry, axis, and the existence of light on the other side are used to guide the viewers. While in Hashti, using the decoration elements and detail encourages the viewer to stay and watch and increases the movement of eyes instead of moving.

Thus, architects can use the idea of physical movement and sensational movement or pause place and solitude place by using or not using the studied elements.

In the present paper, the main aim to create a new classification was achieved in the form of a table of observations (Tables 2, 12 and 13) depicting: 1) the interconnections among different types of movements and architectural elements of movement, 2) different types of stagnation in architectural spaces, and 3) the ratio of the position of the viewer and viewpoint. The generated table could be considered as a framework for the qualitative-quantitative assessment of movement and stagnation in architecture in any building, whether by employing a scale through a questionnaire or a descriptive report.

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