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Learning the Concept of "In-Between" in Architecture from History and Practice

Zubaidah Nadhem Mahmood ALZubaidi[*1], Ayşe Sirel[2]

[1] *Istanbul Aydin University, Institute of Postgraduate Studies, Istanbul, Turkey*
[2] *Istanbul Aydin University, Faculty of Architecture and Design, Istanbul, Turkey*

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Abstract

The in-between space is a spatial concept that cannot be defined as either an interior space or an exterior space. It is seen as a bridge between the inside and the outside. The in-between space provides the protection offered by the interior, while at the same time allowing individuals to maintain contact with the outside. The objective of this study was to examine the differences in approaches to the creation of in-between space and the reasons behind the creation of this space between the past and the present. To this end, the study proposed a series of general frameworks for approaches to the creation of in-between space in traditional and contemporary architecture, which were developed through a comprehensive analysis of the extant literature on the concepts of in-between space in both traditional and contemporary architectural practices around the world. Utilising these frameworks, a set of examples of traditional architecture from various regions worldwide (the Middle East, the Balkans, and the Far East) and a set of modern buildings constructed after World War II until the present, from different regions worldwide, were analysed morphologically and spatially. The selection of these examples was based on the literature's references to the presence of an in-between space. The study's findings revealed that, while the general frameworks are similar, there are remarkable differences in the approaches to the creation of in-between space and the social, functional, and environmental motivations behind its creation between traditional and contemporary architecture, due to the different technological possibilities between the past and present and the complex intellectual backgrounds behind the creation of in-between space in contemporary architecture. The fundamental objective of facilitating human interaction with the external environment persists as the paramount goal in the conception of interstitial space, irrespective of temporal distinctions.

Introduction

Space is defined as the distance or time interval between two points, objects, or events. It is also considered the interrelationship of objects. Space has the ability to set boundaries on the bodies enclosed in it and prevent these bodies from becoming infinitely large or small. Space is not a pure extension devoid of all the attributes of force, but rather a sort of primitive atmosphere equipped with pressure and tension and constrained by infinite void. We, humans, reside in a large and exposed space, commonly referred to as the exterior, which poses danger and threat of exposure to individuals. This paves the way for the human need for a space that provides protection, shelter, and privacy, which is known as the interior [1]. Dividing space into two parts, interiors (inside) and exteriors (outside), is a way for people to locate their place within the environment. Interior has been separated from exterior, since human beings began to build shelters, with increased differentiation between the two spaces along with the development of different human activities inside buildings [2]. These spaces are separated by boundaries, such as walls and floors, which serve as elements that define and divide the space [3]. In this context, Schulz defined the boundaries of the built space as the floor, wall, and ceiling, where the boundaries of the exterior are the ground, horizon, and sky [4]. Occasionally, it is possible to alter the boundaries; the walls could be replaced by the horizon, where the volume simultaneously becomes a part of both the building and exterior [5]. There are several spaces between the interior and exterior, which are defined neither as interior nor exterior, but as in-between spaces [6]. In architecture, the in-between space refers to the relationships and connections between different

* Corresponding author. E-mail address: zubaidahalzubaidi@stu.aydin.edu.tr

loci and is considered a gate that erases sharp boundaries and provides equal access to both interior and exterior, regardless of their private or public nature [7]. Each region and culture has developed its own unique design solutions and uses for in-between spaces, which are reflective of the traditions, beliefs, climate, and available technology of the society, which paved the way for the emergence of special in-between spaces for each culture [2]. This study aimed to investigate the manifestations and characteristics of the in-between space in traditional architecture in different cultures, and to review the changes in the in-between space in contemporary architecture and the motivations/reasons which might have underlined these changes.

In traditional architecture, the in-between space is representative of a response to the environmental, cultural, and technological influences around human beings. As suggested by Shahlaei and Mohajeri, traditional architecture is the result of interaction between human beings and the environment. Traditional spaces, including entrances and *iwans*, for example, are the first examples of in-between spaces in traditional Iranian architecture, providing both comfort and security as well as communication between the interior and exterior [8]. Similarly, upon analysis of the characteristics of the in-between space in traditional houses in North Macedonia and the interaction of the built environment with nature, Atkovska and Murata reported that this in-between space, which is called the *çardak*, was a place connecting the inside to the outside, where different daily life activities were carried out, based on the social construct and the partial location of the in-between space in the house [5]. Jiang pointed out another traditional in-between space, the *engawa*, and suggested that the *engawa*, which functioned as a part of both the interior and the garden, under the eaves, represented the in-between space in traditional Japanese architecture and was designed as a response to local environmental and social needs [9]. Upon review of in-between spaces in India and Japan, such as the veranda in India and the *engawa* in Japan, Sadanand suggested that these transitional spaces, which connected the interior to the exterior, were influenced by local cultural and environmental factors [10]. Previous studies suggested that the in-between space was included in several traditional architectures across cultures, and the forms of which apparently changed as a reflection of the environmental and cultural needs of the cultures in question.

Nowadays, architects engage in calls and initiatives to promote the use of the in-between space in contemporary architecture, stemming from the desire to re-establish the interrelationship between humans and their environment in a positive way. The in-between space concept, which has been considered an approach that emerged after the Second World War, was introduced by Dutch architect Aldo van Eyck as a notion that represents a bridge between inside and outside spaces and a way to increase human interaction in architectural environments [11]. Inspired by the philosopher Martin Buber in developing the in-between notion, the Dutch architect van Eyck believed that boundaries did not act merely as surfaces but as three-dimensional spaces. According to van Eyck, the concept of in-between space encompasses dichotomous elements, such as inside vs. outside, closed vs. open, and centred vs. decentred. As such, these spaces serve as an area of reconciliation, which brings together diverse programs and activities [7]. Van Eyck's concept of the in-between suggests that opposing polarities can become twin phenomena, a common ground where different things meet and unite. True polarities are distinctive components of one entity, while true entities are always twofold. The in-between is an ambivalent space that corresponds to the ambivalent nature of human beings and is a space that breathes in and out [12]. Can and Heath suggested that a good design of the in-between spaces, i.e., the intermediate spaces between the interior and exterior located within buildings and streets, could contribute to the improvement of social dynamics [13]. Özer asserted that a space became a place by means of the relationships that individuals establish with the space, and thus the meaning of the space could not be considered complete without the existence of humans and their interaction with this space [11]. Accordingly, Can and Heath investigated the vital role of the in-between spaces in cities and how these spaces influenced the social interaction between their residents [13]. A study by Shahlaei and Mohajeri concluded upon review of the interior-exterior and the in-between space concepts that the in-between space was a design solution to concurrently enjoy the interior and exterior [8]. Jiang pointed out how contemporary Japanese architects used the relationship between the inside and outside with an aim to create modern in-between spaces, which were reflective of the spirit of Japanese tradition, responded to environmental and social needs, and integrated architectural ideas with different contexts [9]. A study by Osorio, which investigated the role of in-between spaces, including corridors and ground-floor balconies, in contemporary Antofagasta architecture, reported that these spaces provided protection against the sun, allowed enjoying the outdoors, and provided an ongoing connection with the environment [14]. Furthermore, Shahlaei and Mohajeri suggested that a range of factors should be taken into consideration, including architectural functions, climatic conditions, cultural factors, and lifestyle, etc., so as to create pleasing in-between spaces in functional and aesthetic terms [8]. Osorio added that the concept of the in-between space could be used in various climatic regions, provided that there was a balance between exterior elements and interior design [14]. Previous studies suggested that in-between spaces were promoted as a concept in contemporary architecture, representing a way for people to reconnect with their environment, increase

social interaction, and provide effective environmental solutions. Today, the ever-changing boundaries between the inside and outside, in combination with modernity and the use of glass, confirm the continuity of the interior and exterior and that the lines between the interior and exterior or public and private spaces have been blurred [3]. In addition, Maghami and Ghasr mentioned that the transparent properties of glass could be used depending on the environmental factors and the design of the building to strengthen or constrain the association between the interior and exterior [15]. While exploring the possibilities of reaching uncertain boundaries in architecture, Yücel and Düzgün discovered that these boundaries could be found by using design elements and suggested that this started with the emergence of modern architecture, which brought transparency and freedom to building shells, and that it would continue in contemporary architecture, creating a stronger relationship potential between interior and exterior [3]. Furthermore, Maghami and Ghasr asserted that innovations in architecture and certain materials, including glass, changed the interaction between the inside and the environment, allowing improved functionality and aesthetics and reshaping the boundaries of indoors and outdoors [15].

As can be seen, new ideas, technological developments, and modern materials are considered factors that have been instrumental in the emergence of in-between spaces in contemporary architecture. The introduction of in-between spaces in the traditional architecture of various cultures across the world is considered a response to societal needs. Such spaces vary in terms of forms and functions due to the diversity of environmental and cultural conditions and the technological possibilities available in these cultural milieus. Current experiences, which are put in place or require the use of in-between spaces, can also be considered a response to environmental and cultural needs and the human need to communicate with the outside. Technological advancements in the contemporary world have enabled the re-creation of in-between spaces, which simulate traditional in-between spaces and meet the cultural and environmental needs of contemporary individuals. In-between space has been considered an important concept in contemporary architecture as well, like traditional architecture.

I. Research Methodology

Textual, visual and spatial analysis methods have been used to investigate the in-between space, the approaches that were used to create the in-between space, and the differences between these approaches in traditional and contemporary architecture.

The first step of the four-stage study included textual analysis. Accordingly, first, the academic database available on the Internet was reviewed in detail. Upon general review, a textual analysis was conducted based on Google Scholar searches, scientific studies on the subject, architecture and urban design journals, architectural websites and blogs (ArchDaily, Dezeen, etc.) with the views of different authors on the in-between space and the construction of the in-between space. This stage, which included the review of the conceptual framework, provided a better understanding of the in-between space.

In the second stage, according to the reviewed viewpoints and by examining several examples of in-between spaces in architectural practice, the research proposed three approaches to the creation of in-between spaces in both traditional and contemporary architecture, which were used for the formal and spatial analysis of in-between spaces to clarify the differences and similarities between in-between spaces in traditional and contemporary architecture. The approaches were as follows:

1) pulling part of the outside toward the inside,
2) extending part of the inside toward the outside,
3) using transparent materials.

A mix of various urban models, concepts, and ideas are used by urban planners nowadays depending on the local In the third stage, a formal and spatial analysis of a set of examples that contain an in-between space was

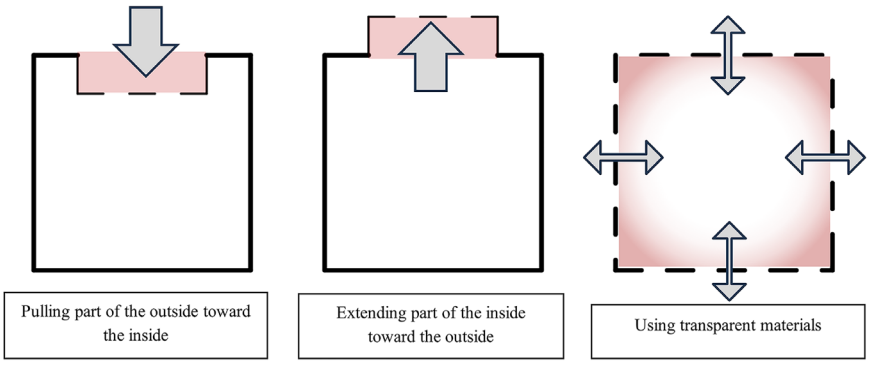


Fig. 1. The approaches to the creation of in-between space (by the authors).

carried out to illustrate the similarities and differences between the in-between space in traditional architecture and contemporary architecture. Several examples of traditional architecture in different parts of the world (the Middle East, the Balkans, and the Far East) were analysed, and the factor behind the selection of these examples was the reference in literature to the presence of the in-between space. For comparison, a group of modern buildings constructed after World War II to the present, in different parts of the world, which also contain an in-between space according to the literature, was also analysed. The formal and spatial analysis was carried out within the framework of the approaches to the creation of the in-between space that have been presented previously.

In the fourth stage, given the data/findings of the third stage, the differences and similarities were identified, and the reasons for these differences and similarities were explained within the framework of the approaches to the creation of the in-between space proposed by the study, as well as the motives behind the creation of the in-between space in both traditional and contemporary architecture. In the fourth stage, given the data/findings of the third stage, the differences and similarities were identified, and the reasons for these differences and similarities were explained within the framework of the approaches to the creation of the in-between space proposed by the study, as well as the motives behind the creation of the in-between space in both traditional and contemporary architecture.

II. The Approaches Used to Create the In-Between Space in Traditional and Contemporary Architecture

A. The Approaches Used to Create the In-Between Space in Traditional Architecture

Pulling part of the outside toward the inside. This approach, creating an in-between space, can be observed at the entrance of traditional houses in Iran. This space, which was introduced by pulling the door inwards, is a transitional area that has been created to wait until the door opens or to talk. Typically, there are two sitting areas in this place, where the elderly can take a seat and have a rest. People can occupy this place without disturbing other passers-by on the road. Therefore, it can be said that an in-between space was created at the entrance as an intersection point between the private interior and the public exterior in Iranian traditional architecture [8]. *Jelokhan* refers to a recess in the entrance area of buildings. It is an Iranian threshold created by allocating a portion of private property for the benefit of the public. The more important the building, the larger its *jelokhan*, and the presence of the *jelokhan* helps make the entrance section of a building more prominent, inviting, and different from the street, square, or place where the building is located. The *jelokhan* of the Shah (Imam) Mosque in Nagsh-e Jahan Square of Isfahan gives an idea of the threshold at the city level (Figs. 2 and 3) [16].

Fig. 2. In-between space at the entrance section of the Shah (Imam) Mosque in Nagsh-e Jahan Square, Isfahan–*jelokhan* [16].

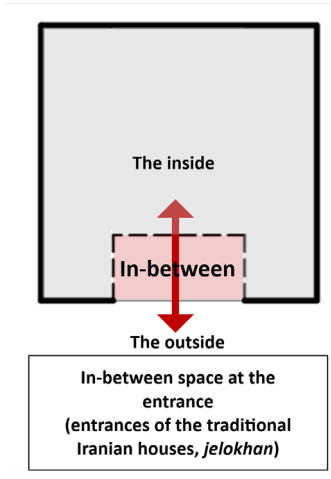


Fig. 3. The spatial analysis of the formation of the in-between space by pulling part of the outside space into the inside in the entrances of Iranian houses and the *jelokhan* (created by the authors).

Fig. 4. In-between space at Al Mustansiriyah School in Iraq [17], [18].

Another example of creating an in-between space by pulling part of the exterior space to the interior is the *sofa*, which is an in-between space in traditional houses in Turkey that connects the inside and outside and acts as a perforation in the courtyard facade [17]. Similar to a *sofa*, the *iwan* connects the interior to the private exterior (courtyard). As a semi-open and semi-enclosed space, it is typically a raised seating area with a roof on top of it and an open front. Serving as an in-between space between open and closed areas, the *iwan* provides natural light and moderate temperature (Figs. 4 and 5) [8].

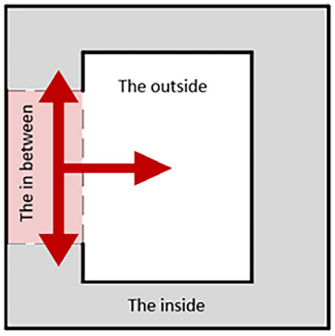


Fig. 5. The spatial analysis of the formation of the in-between space by pulling part of the outside space into the inside in the *iwan* and *sofa* (created by the authors).

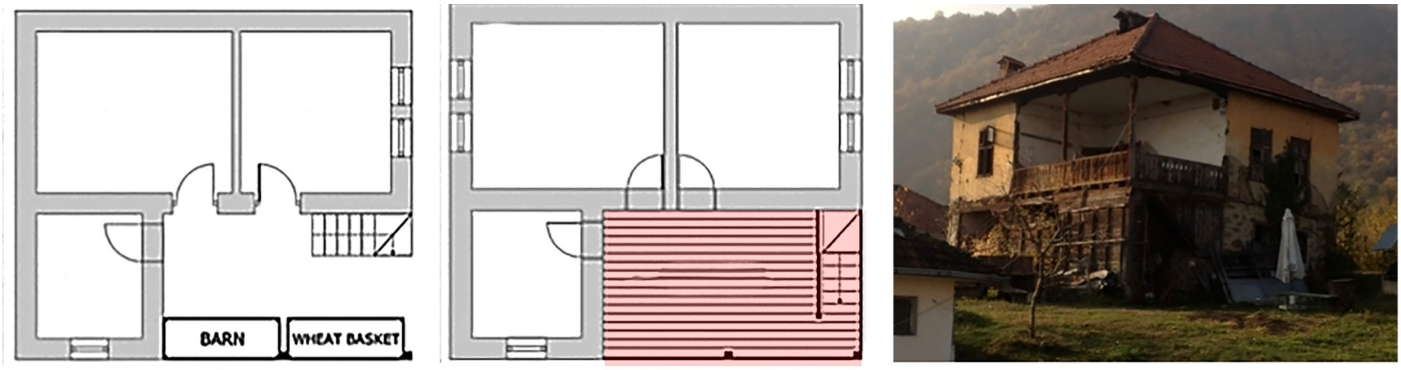


Fig. 6. In-between space in a traditional Macedonian house– *çardak* [21].

The *iwan* developed as a space allotted from the inner surface of the courtyard. It appears as an intermediate level of openness and creates a transition between the interior and the exterior courtyard [17]. The *iwan*, which is associated with both transition and threshold, is interpreted as the space of the soul's movement between the courtyard, which represents the soul, and the chamber, which represents the body [18].

The approach of pulling part of the outside into the inside is also observed in another culture, in the traditional houses of Macedonia. This in-between space, generally defined as a semi-open area on the upper floor where various daily activities take place, is called *çardak* (Figs. 6 and 7). Depending on the social status and location of the *çardak* in the traditional house, this space assumes several functions, ranging from housework to sleeping during the summer season, from wedding celebrations to representing the status of the family. The *çardak* connects the house with nature, and its spatial characteristics are defined by the microclimate and social norms [5].

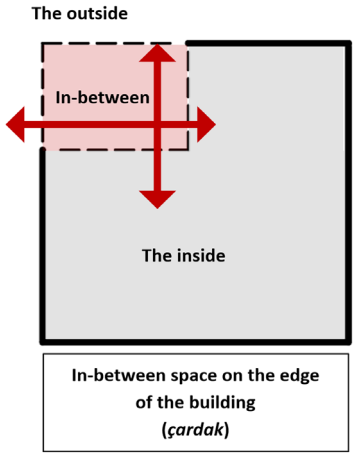


Fig. 7. The spatial analysis of the formation of the in-between space by pulling part of the outside space into the inside in the *çardak* (created by the authors).

Extending part of the inside toward the outside. This approach can be seen in the engawa, an architectural space popular in Japan since the Middle Ages. Located under the eaves and blurring the line between indoors and outdoors, the purpose of the engawa is to protect traditional Japanese houses from rain and to provide shade from the sun. The eaves also serve as a place for people to gather, play, and rest during the summer heat. In this way, the boundary between architecture and nature is blurred, and a sense of infinite expansion is created (Figs. 8 and 10) [7]. At times when weather conditions are considered unfavourable, the individual wooden shutters of engawa can be closed to protect the rooms [10]. It acts as an interface between the inside and the outside, providing a unique and versatile space for both residents and guests [7].

Similar to the Japanese *engawa*, the veranda of the South Indian villages is in the form of a raised sitting area called *thinnai* intended for receiving guests and various activities (Figs. 9 and 10). Its versatility is associated with the fact that thinnai functions as a social space that adapts to the climate and environment, while providing shelter against harsh weather conditions. Like the Japanese *engawa*, *thinnai* also serves as a connection to nature [10].

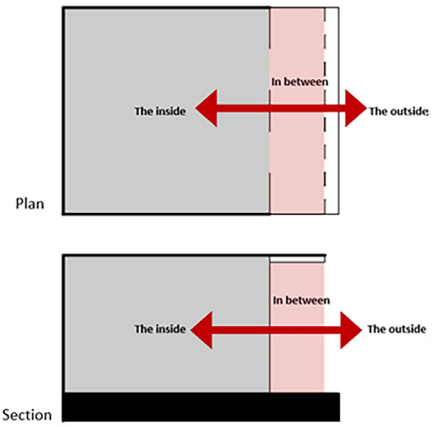


Fig. 10. The spatial analysis of the formation of the in-between space by extending part of the inside toward the outside in *engawa* and *thinnai* (created by the authors).

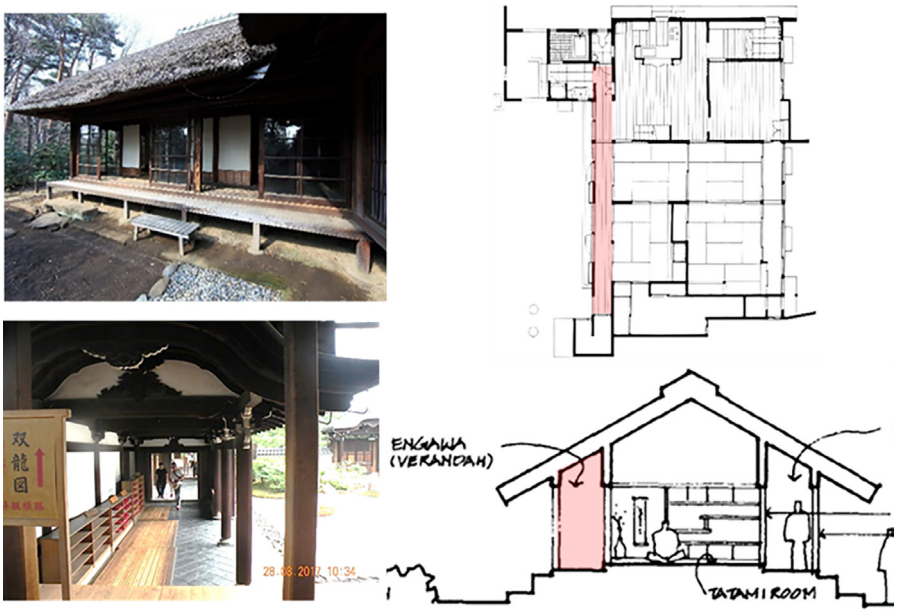


Fig. 8. In-between space in the Japanese traditional house – *engawa* [22], [23], [24], Sirel (2017).

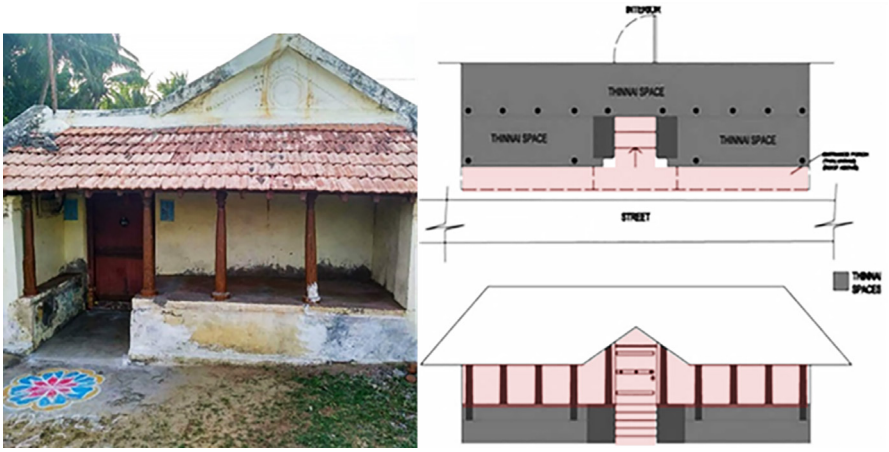


Fig. 9. In-between space in the traditional Indian house – *thinnai* [25], [26].

In Islamic cities, the void between the building and the street plays an important role in social interaction and behaviour. This spatial organisation creates social interaction and vice versa. The internal extensions of the building, including (cumba (bay)) balconies, porticos, sottoportici, arcade, veranda, and *riwag*, *kabalti*) help establish the connection between private and public spaces. Basically, these extended spaces promote certain social interactions in the built environment [17]. Islamic architecture created *al'fina* because of these expansions. *Al'fina* is an ancient Arabic word used to define two areas in ancient Islamic cities. The first is the inner courtyard, and the second is the space in front of or around the buildings. *Al'fina*, as an in-between space, is bounded by streets and buildings (Figs. 11 and 12) [2]. *Al'fina* serves as a transition and interaction space between the private and public boundaries of a property. It is an invisible area along the exterior walls, used only by the occupants of the building. The width and area of al'fina depend on the street conditions. *Al'fina* is used as a social and recreational space that provides interaction between private and public spaces in traditional communities. The windows of the house open directly to the public space, allowing visual and mutual interaction [17].

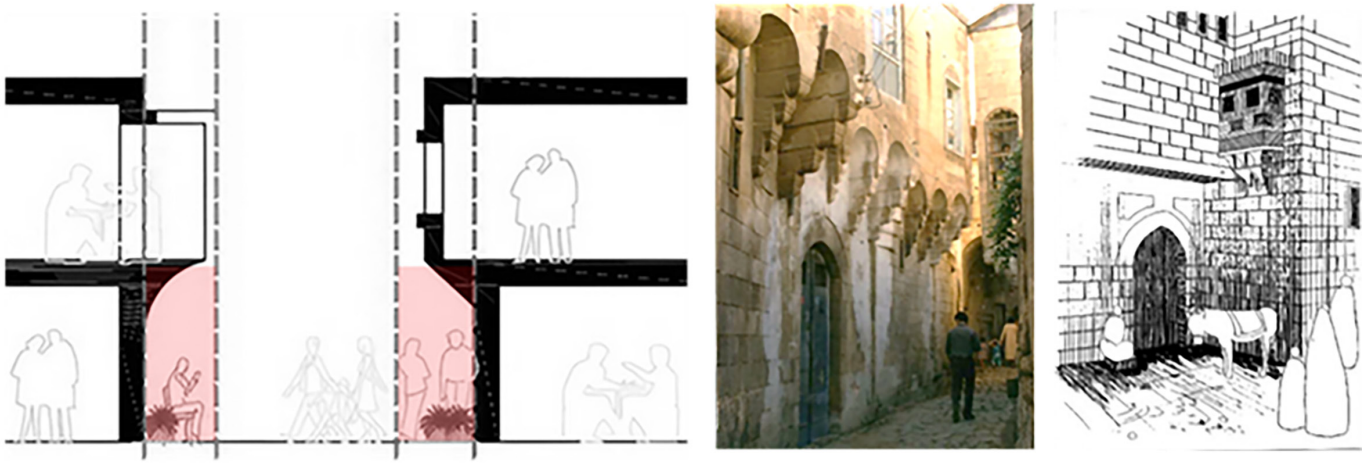


Fig. 11. In-between space in Islamic cities – *al'fina* [16], [25].

The space of al'fina served different functions, private or public or both. Where it met the needs of users in the context of several factors, including climate, religion, community, privacy, commerce, lifestyle, and population growth, all of which are subject to local interpretation [2].

Using transparent materials. The use of *washi* (Japanese paper) in traditional Japanese architecture is representative of the approach of using existing materials and technologies to achieve transparency to allow communication with the outside in traditional architecture (Figs. 13 and 14).

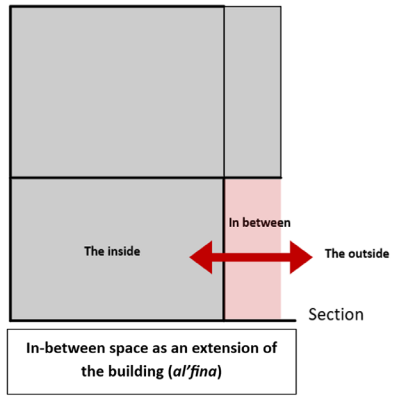


Fig. 12. The spatial analysis of the formation of the in-between space by extending part of the inside toward the outside in *al'fina* (created by the authors).

Fig. 13. Use of *washi* paper in traditional Japanese architecture [9], [26].

Made from mulberry trees, *washi* paper has been used since the 14th century as a lightweight, translucent material for windows and curtains, providing privacy while letting in the sounds of nature and unique light effects [9].

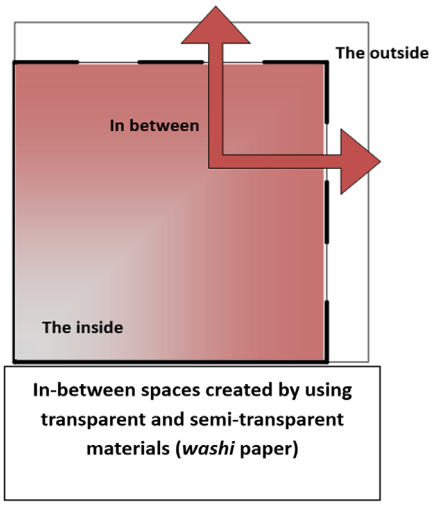


Fig. 14. The spatial analysis of the formation of the in-between space by using transparent materials (*washi* paper) (created by the authors).

Fig. 15. The in-between space at the entrance of the Orphanage Building in Amsterdam [30].

B. The Approaches Used to Create the In-Between Space in Contemporary Architecture

Pulling part of the outside toward the inside. Dutch architect van Eyck suggested that the in-between space brings together dichotomous elements, such as inside vs. outside, closed vs. open, and central vs. decentralised, and functions as an area of reconciliation that integrates different programs and activities [7]. Van Eyck considered dichotomies not as opposing entities, but as complementary halves. This concept is developed by superimposing two poles and creating a field that simultaneously encompasses both. The in-between refers to the point where two different worlds intersect, filled with multiple meanings in harmony [29]. This approach allows for the creation of in-between spaces that promote encounters, negotiations, and transformations in urban environments [16]. In this context, van Eyck used distinctive architectural elements to create connections between the inside and outside in contemporary architecture. For example, van Eyck created a vertical void using a multi-story entrance in the Hubertus House in Amsterdam. While he used a threshold concept to define the transition from public to private for the Amsterdam Orphanage building, creating a courtyard that extends from the building outward and connects to the surrounding city (Figs. 15 and 16) [29]. Van Eyck created an in-between space at the entrance to these buildings by pulling part of the exterior into the interior.

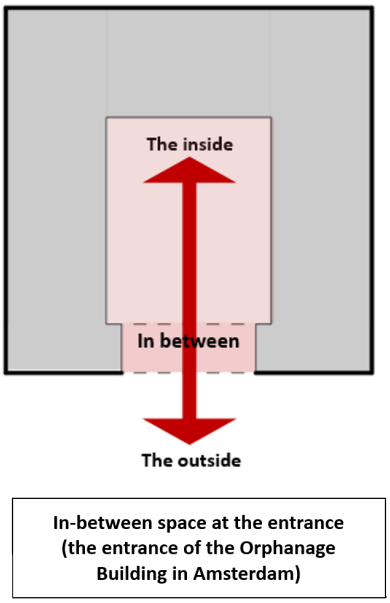


Fig. 16. The spatial analysis of the formation of the in-between space by pulling part of the outside space into the inside in the entrance of the Orphanage Building in Amsterdam (created by the authors).

Upon analysing the examples of in-between spaces in Antofagasta (Chile), Osorio mentioned that architectural designs integrated outdoor elements to provide protection from the sun and create spaces that were in harmony with their surroundings. Osario discussed open courtyards and terraces that serve as connections between buildings and their surroundings. For example, the city hall in Antofagasta, designed by Renato D'Alençon, has a courtyard that faces the eastern mountains. The courtyard is surrounded by three-story buildings and enriched with columns and beams that filter sunlight into the courtyard. While the in-between space design feature promotes a harmonious interaction between the interior and exterior environments, it also guides the circulation within the building [14]. In a similar approach, van Eyck adopted a roofless vertical void in the Schmela Gallery to connect the interior and exterior (Figs. 17 and 18). This space blurred the lines between exterior and interior spaces [29],

Fig. 17. Creating in-between space with roofless vertical void in the Schmela Gallery [29], [30], [31].

creating an in-between space that pulled back the outside into the building.

Sō Fujimoto suggests that architecture is not a single space, but exists through the interrelationship of space and space, space and its environment, and the in-between which connects one thing to another [34]. Fujimoto believes in bringing together nature and architecture. He advocates "weak architecture", which clears hurdles, creates fluid spaces for interaction, and creates rich connectivity between spaces [9]. Fujimoto focuses on the gap between the city and the home in his House N building. The house is composed of three nested boxes/shells, and the space between the outermost and the adjacent box is considered as a space between urban (public) and residential (private)

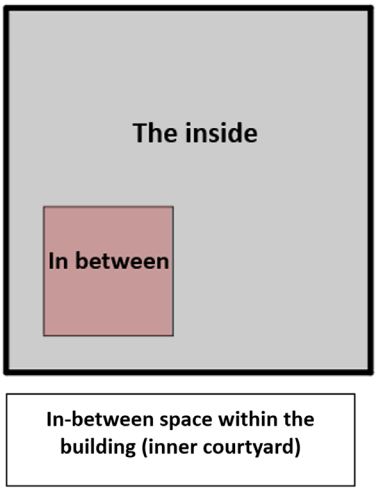


Fig. 18. The spatial analysis of the formation of the in-between space by pulling part of the outside space into the inside in the roofless vertical void in Schmela Gallery (created by the authors).

areas. House N assigns a new meaning to space, which is typically perceived as a garden (Figs. 19 and 20) and defines it as half-exterior, half-interior [7]. The house was designed as three intermingled levels. Covering the entire structure, the outermost shell defines a semi-enclosed garden. The second shell defines a constrained interior space within the semi-enclosed garden area. The third shell, on the other hand, creates a smaller interior space. The life cycle inside the house is envisaged to run between the semi-closed, closed, and open areas created by these shells [35]. Fujimoto created an in-between space in House N by pulling the outside into the building at the edge, using layers and voids to connect with the surroundings, and create a sense of mystery.

Fig. 19. The in-between space in the House N consisting of three nested shells [34], [9].

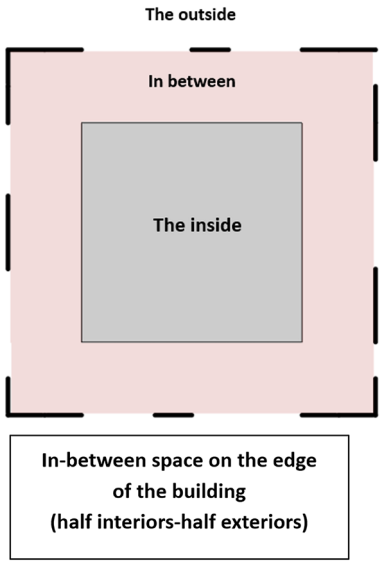


Fig. 20. The spatial analysis of the formation of the in-between space by pulling part of the outside space into the inside in the House N (created by the authors).

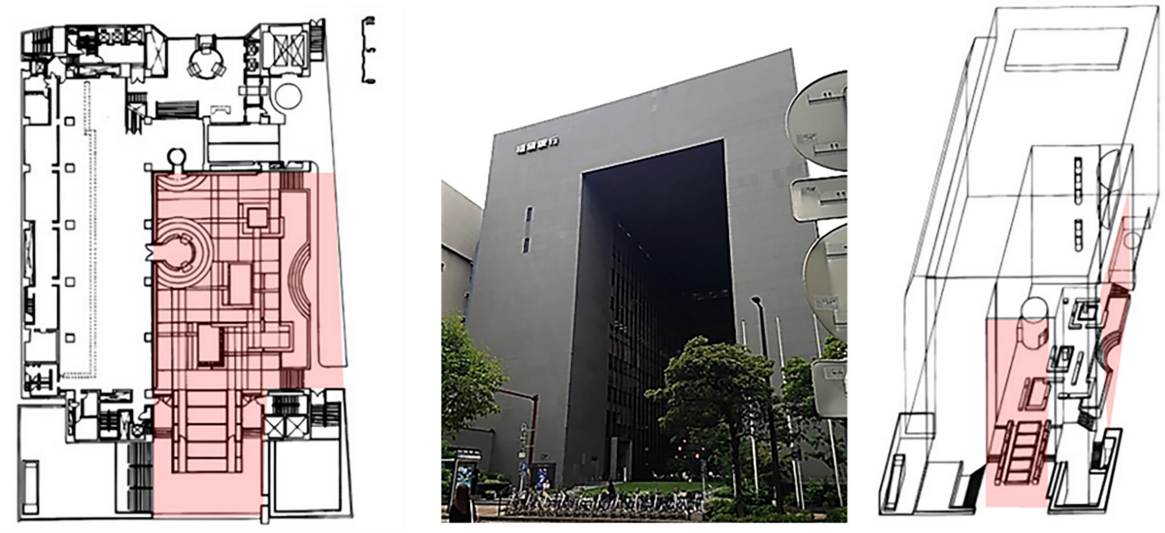


Fig. 21. The in-between space at Fukuoka Bank headquarters [37].

Extending part of the inside toward the outside. This approach can be seen in the work of the Japanese architect Kisho Kurokawa, who has incorporated in-between spaces, including the *engawa* placed in front of and around traditional Japanese houses, into contemporary architecture [29]. Kurokawa introduced the concept of the "grey area" in architecture, which aims to bridge the gap between the inside and the outside. This idea was incorporated into the design of the Fukuoka Bank headquarters, which features a large plaza under the eaves that serves as a transitional space between the private offices and the public plaza (Figs. 21 and 22) [9]. Kurokawa created a "semi-open public space" by using the *engawa*, which brings together the interior and exterior [29]. Kurokawa masterfully combined nature and building through a transparent facade and well-placed entrances, and incorporated traditional Japanese architectural elements, including eaves, to provide shade and protection from rain [9].

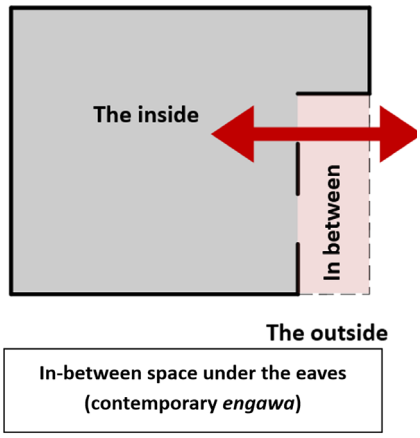


Fig. 22. The spatial analysis of the formation of the in-between space by extending part of the inside toward the outside in the Fukuoka Bank headquarters (created by the authors).

Architect Bernard Tschumi is particularly interested in in-between spaces and their potential and sees the inclusion of in-between spaces as a solution to complex projects. Tschumi treats the in-between space as an intermediate space that highlights contrasting elements and creates tension between them. Tschumi incorporated the concept of in-between space into the historic building of Le Presse Noir National Studio for Contemporary Art in Paris by adding a new roof that created an in-between space between the old building and the new roof, creating a half-outdoor, half-indoor podium (Figs. 23 and 24) [7].

Fig. 23. In-between space on the historic Le Presse Noir National Studio for Contemporary Art in Paris [36], [37], [7].

Using transparent materials. This approach can be seen in the well-known masterpiece by Junya Ishigami, KAIT Kobo of the Kanagawa Institute of Technology, which is a workshop without walls. The space is supported by 305 slender, independent columns that are oriented in a distinctive direction and positioned at varying intervals. Each column is meticulously placed to mimic the randomness of a forest, reflecting Ishigami's reverence for the essence of nature. The intentional ambiguity in defining the function of each area within KAIT's design adds to its mystique. In addition, the integration of plants blurs visual boundaries, creating an enigmatic extension of each space. This intentional design embodies the fluidity of space and presents a captivating expression of the ambiguity of interior and exterior spaces within the realm of contemporary Japanese architecture (Figs. 25 and 27) [9].

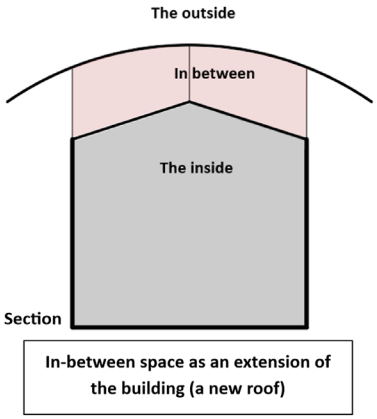


Fig. 24. The spatial analysis of the formation of the in-between space by extending part of the inside toward the outside in the Le Presse Noir National Studio for Contemporary Art (created by the authors).

Fig. 25. Blurring visual boundaries by means of transparent glass in the KITE Kubo-Kanagawa Institute of Technology building [40].

Fig. 26. Using transparent materials at the UNC Campus [42].

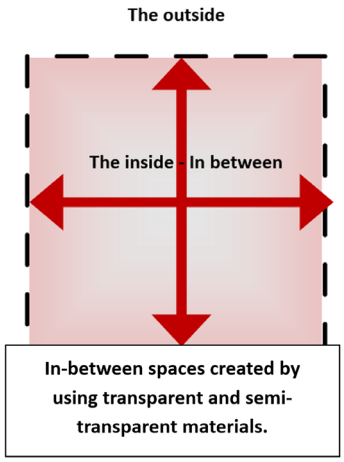


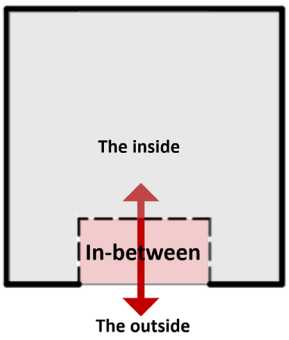
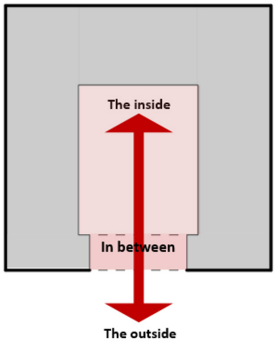
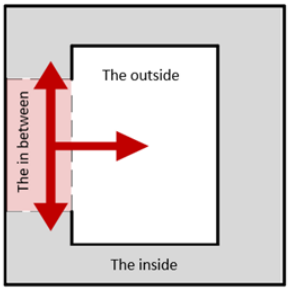
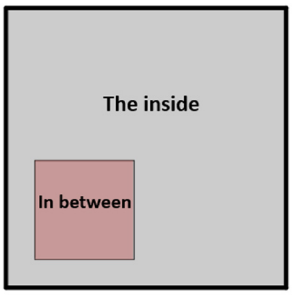
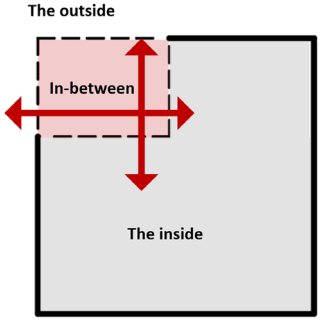
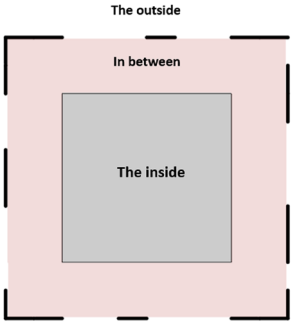
Fig. 27. The spatial analysis of the formation of the in-between space by using transparent materials (created by the authors).

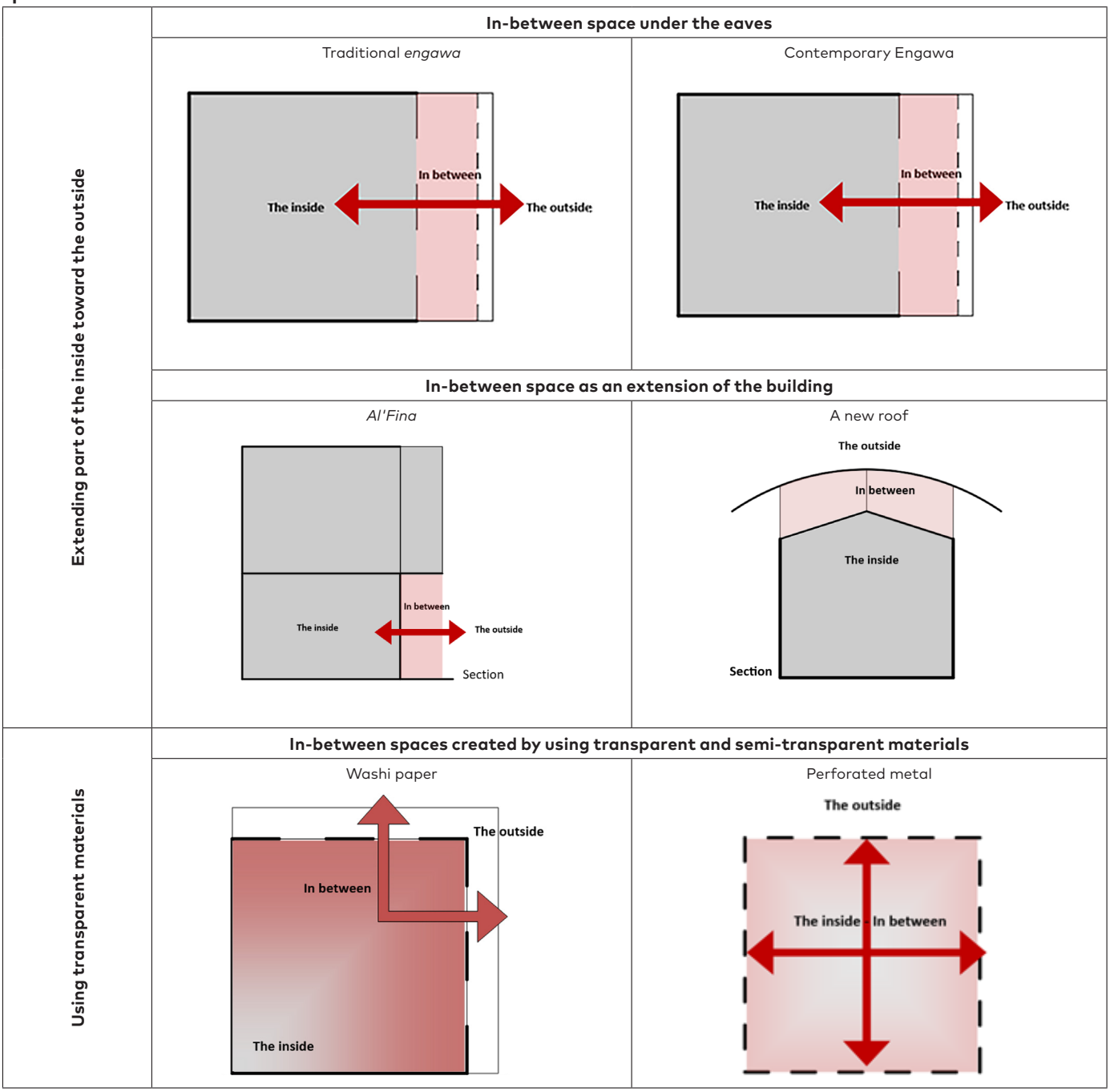
In the UNC Campus Virtual, designed in 2018 by Deriva Taller de Arquitectura (Guillermo Mir and Jesica Grötter) in Cordoba, Argentina, the continuity of the landscape is maintained by creating an open area in a simple cube structure on the ground floor. A ramp connects the ground floor to the upper floor, allowing the public space to flow seamlessly between the two levels. This ramp, positioned on the facade of the building, along with the open spaces between the cube volume and the metal skin that encloses it, enhances user mobility and serves as an interface that provides views of the city. The design emphasises the concept of immateriality by abstracting from material elements (Fig. 13) [3]. The external view of the building

is in the form of a white, permeable and transparent cube that changes its configuration depending on the light and offers an ambiguous appearance [41]. Here, the architects have created an in-between space by drawing the outside towards the inside as well as using the possibilities of the new materials and their transparency to connect with the external environment (Figs. 26 and 27). The special analysis of the changes in the approaches used to create in-between spaces, between traditional and contemporary architecture, is summarised in Table I.

TABLE I

The Special Analysis of the Changes in the Approaches Used to Create In-Between Spaces Between Traditional and Contemporary Architecture [Created by the authors]

Formal approach	In-between space in traditional architecture	In-between space in contemporary architecture
Pulling part of the outside toward the inside	**In-between space at the entrance**	
	Iran, entrance of a house *jelokhan* (entrance) 	Threshold (entry) 
	In-between space within the building	
	Iwan, sofa 	Inner Courtyard 
	In-between space on the edge of the building	
	Çardak 	Half interiors-half exteriors 



III. Results

A. Pulling Part of the Outside Toward the Inside

After analysing the in-between spaces that fell within this classification formally and spatially, the research found that the in-between space was located in specific places of the building (at the entrance of the building, within the building, and on the edge of the building). After analysing and comparing the in-between spaces located in the same location within the building, formally and spatially, in both traditional and contemporary architecture, the research found the following:

- The in-between space at the entrance of the building (entrances of the traditional Iranian houses, *jelokhan*) in traditional architecture was created by pulling the door inward, while in contemporary architecture (the entrance of the Orphanage Building in Amsterdam), the entrance did not appear as a mere boundary, but as a complex three-dimensional space that blurs the boundaries between interior and exterior spaces.
- The in-between space within the building in traditional architecture (*iwan*, *sofa*) is an opening, within the inner facade of the courtyard, that faces the centre. In contemporary architecture (Schmela Gallery), a complex vertical space was created within the

body of the building, allowing the interior spaces to communicate with the exterior.
- The in-between space on the edge of the building, in traditional architecture (*çardak*), was created by pulling one of the outer walls of the building back towards the interior. In contemporary architecture (the N-house), different parts of the external surfaces were pulled inward and at the level of all the external facades of the building, and by using layers, an in-between space was created that connects the inside and the outside, from all four sides.

B. Extending Part of the Inside Toward the Outside

After analysing the in-between spaces that fell within this classification, formally and spatially, the research found that they have two forms:
- In-between space located under the eaves (*engawa*, *thinnai*) in traditional architecture, which was created by small-sized eaves extensions, while in contemporary architecture, as in Fukuoka Bank headquarters, the in-between space was a major space and was created by large-scale extensions.
- In-between space underneath the extended parts of the building. In traditional architecture, it is represented by the *al'fina*, which is a small space resulting from limited extensions of the building's facade, while in contemporary architecture, the extensions were a huge new roof covering the entire building (Le Presse Noir, the National Studio for Contemporary Art) and forming a giant and complex in-between space underneath.

C. Using Transparent Materials

After formal and spatial analysis, the research found that the in-between spaces in traditional architecture, which fell within this approach, resulted from a limited use of transparent materials (washi paper). In contemporary architecture (the KITE Kubo-Kanagawa Institute of Technology building– the UNC Campus building), glass and transparent materials were used on a large scale, which resulted in turning the building into a visually permeable space that represents, as a whole, an in-between space.

The research also found that there are social, cultural, functional, and environmental factors behind the creation of in-between spaces in traditional and contemporary architecture. In traditional architecture, the in-between space provided opportunities for social interaction in addition to being a transitional space that protects interior privacy. The in-between space was also used as a multifunctional space, serving as a seating area, sleeping area, children's playground, and a place where many different activities could take place. In contemporary architecture, on the other hand, the in-between space is a public meeting space that promotes social interaction, increases opportunities for encounters, and ends the isolation of people from their environment created by modern architecture. It was used as a tool to revitalise traditions and solve complex projects. From an ecological perspective, the in-between space was one of the methods developed by traditional architecture to deal with difficult environmental conditions. In contemporary architecture, the in-between space has also been seen as a solution to the challenges associated with climate change and minimising energy use.

IV. Discussion

Upon a comparison of the approaches to the creation of the in-between space in both traditional and contemporary architecture, although these approaches are very diverse, the general frameworks of these approaches share similar patterns in both traditional and contemporary architectural practices. Whether in the past or today, the main purpose of creating an in-between space is to create a space that can provide communication between the interior and exterior and meet the socio-cultural, functional, and environmental needs of humans. Three different approaches were adopted in traditional architecture to achieve this, and at the level of different parts of the building. These three different approaches included replacing one of the boundaries of the built space, which were defined by Schultz, as the floor, walls, and ceiling [4], to communicate with the exterior. This can be done either by pulling part of the outside toward the inside, extending part of the inside toward the outside, or using transparent materials. Traditional architecture achieved this with the technological possibilities then available and as an expression of the cultural and societal characteristics of the society in which this space was introduced. This is consistent with Nooraddin's (1998) argument that each region and culture has developed its own unique design solutions and uses of in-between spaces, which reflect the societal traditions, beliefs, climate, and technology of that region [2].

It is remarkable that there are contemporary calls and practices which summon the use of traditional experiences with an aim to create an in-between space. This is clearly evident in the way contemporary Japanese architects have used the relationship between the interior and exterior to create modern in-between spaces that reflect the spirit of Japanese traditions, respond to environmental and social needs, and integrate architectural ideas with different contexts [9]. This explains the similarities in the general frameworks of the approaches to the creation of the in-between spaces and the reasons underlying the creation of such spaces in traditional and contemporary architecture. Approaches to the creation of the in-between space in contemporary architecture and the reasoning behind it have been more complex and diverse despite the similarities in the general frameworks. This may be associated with the great possibilities provided by modern technology,

which endowed contemporary architects' great freedom to implement complex and diverse ideas and approaches. Accordingly, it is now possible, for example, to create completely transparent buildings in which the interior spaces are transformed into in-between spaces where interior and exterior are completely intertwined. Innovations in glass technology as an architectural material have changed the way the building interior interacts with the exterior and reshaped the boundaries of inside and outside [15]. The introduction of novel ideas in contemporary architecture has increased the diversity of in-between spaces and the goals that architects have tried to achieve through this space. The novel ideas, which considered the concept of in-between space as a means of re-establishing the relationship of modern human beings with their external environment, included the suggestions of van Eyck, who introduced the concept of in-between as the point, where individuals communicate with each other and with their environment [11], Fujimoto's ideas about "weak architecture" that clears the hurdles [7], Kurokawa's approach, which is associated with the importance of in-between space and uncertainty [29], Schumi's ideas about integrating in-between space as a solution to complex projects and as a connection that creates tension and liveliness between opposing spaces [7], and Ishigami's theory and approach to flexible spaces and the blurring of internal and external contexts [9]. Therefore, technology and ideation were the main factors in the differences that emerged in the formal approaches towards creating the in-between space and in the reasons underlying the creation of such space between traditional and contemporary architecture.

CONCLUSIONS

Man has constructed the interior to protect himself from unwanted outside influences and to provide comfort. However, man's desire to communicate with the outside environment has persisted from ancient times to the present, as it is a basic human need. Therefore, the need arose to create a space that would allow communication with the outside while providing the protection that the inside offers. The concept of in-between space was introduced into architecture as a means of balancing these two spatial needs. Given that basic human needs have always been the same everywhere and at all times, the in-between space introduced by traditional architecture as a response to human needs continues to manifest itself in many contemporary architectural practices today. However, the in-between space has taken different forms in conventional and contemporary architectural experiences. These forms have been altered, shaped, and diversified by the cultural and environmental conditions and technological possibilities of each society in which they were introduced. While the in-between space in contemporary architecture shares the basic structural attributes of traditional architecture, it exhibits more diverse and complex characteristics in accordance with the diverse and complex contemporary ideas behind its creation, the advanced technological capabilities, and the diversified cultural, functional, and environmental needs of contemporary people. Contemporary in-between space is an inherited lesson from traditional architecture on how to keep people connected to their environment and how to provide multifunctional spaces to ensure that they provide social connectivity and act as an innovative environmental solution. Especially with the technological possibilities, new materials, and rich intellectual background, contemporary architects need to creatively utilise these opportunities and ideas, as observed in the contemporary architectural experiences considered for the purposes of this study. In addition, architecture must expand the use of the concept of in-between space by adopting innovative and creative approaches that reflect our contemporary world.

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Zubaidah Nadhem Mahmood ALZubaidi, MSc, is a Lecturer at the University of Mosul, Mosul, Iraq. She completed her undergraduate studies at the Department of Architecture, University of Mosul in 2005. In 2019, she received her master's degree from the University of Mosul. She was a research assistant at the same university between 2005 and 2019. Between 2019 and 2022, she was a Lecturer at the University of Mosul. Since 2023, he has been pursuing her PhD education at Istanbul Aydin University.

Ayşe Sirel, Dr, Professor at Istanbul Aydın University, Istanbul, Turkey. She completed her undergraduate education at Mimar Sinan University, Department of Architecture in 1980. In 1982, she received her master's degree from Yıldız Technical University. In 1993, she received her PhD degree from Mimar Sinan University. She worked as an assistant at the same university between 1983 and 1993 and as an assistant professor at Trakya University Faculty of Architecture between 1994 and 2008. Since 2009, he has been continuing her academic studies at Istanbul Aydın University and became a professor in 2022. She has written many articles, symposium papers and book chapters in the field of architectural design and urban design in national and international publications. She is currently the editor of "A+ Arch Design", the journal of the IAU Faculty of Architecture and Design.

Contact Data

Zubaidah Nadhem Mahmood ALZubaidi
E-mail: *zubaidahalzubaidi@stu.aydin.edu.tr; zubaidanadhim@uomosul.edu.iq*
ORCID iD: https://orcid.org/0000-0003-2480-4348

Ayse Sirel
E-mail: *aysesirel@aydin.edu.tr*
ORCID iD: https://orcid.org/0000-0002-5244-3001