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THE AMBIVALENCE OF SPACE IN HOUSING ARCHITECTURE AS A RESULT OF LAYERED ARCHITECTONIC STRUCTURE

Abstract

Space that cannot be precisely defined by certain conventional spatial category (for example as interior or exterior), because it takes over the characteristics of various spaces, expresses ambivalent features. Such a spatial category often occurs in complex architectonic structures, that are created by the insertion of spatial layers one within another. Its presence enriches the spatial experience of the architecture and contributes to the creation of unique ambience values, that affect the residents' lives. This paper has the goal to investigate the spaces of this kind in housing architecture and to determine their importance in the terms of housing comfort.

Keywords: ambivalent space, layered architecture, housing architecture

АМБИВАЛЕНТНОСТ ПРОСТОРА У СТАМБЕНОЈ АРХИТЕКТУРИ КАО РЕЗУЛТАТ СЛОЈЕВИТЕ АРХИТЕКТОНСКЕ СТРУКТУРЕ

Сажетак

Простор који се не може прецизно дефинисати неком конвенционалном просторном категоријом (нпр. као ентеријер или ектеријер), јер поприма карактеристике разних простора, изражава амбивалентне особине. Оваква просторна категорија се често јавља у сложеним архитектонским структурама које настају уметањем просторних слојева једног унутар другог. Њено присуство обогаћује просторни доживљај архитектуре и доприноси стварању јединствених амбијенталних вредности, које утичу на живот станара. Овај рад има за циљ да истражи просторе ове врсте у стамбеној архитектури и утврди њихов значај у погледу стамбеног комфора.

Кључне ријечи: амбивалентни простор, слојевита архитектура, стамбена архитектура

1. INTRODUCTION

Between open and closed, between in and out, between private and public, between light and dark, between past and future... the line is as narrow as it is wide. But, what happens when those opposites meet in the course of time, place and content? How do they interact with the structure? How do they move the architecture? How strong is the power that occurs when opposites collide?



Figure 1. *MINI and MAXXI move together, motto of the Museum MAXXI in Rome, photo taken in 2017 during the exhibition: "The Japanese House. Architettura e vita dal 1945 a oggi", Museo Nazionale delle arti del XXI secolo - MAXXI, Rome*

Although the precise definition of space hasn't been specified yet, and would probably never be due to subjectivity of its perception, still the space remains the most important element of any architecture. When it comes to buildings, normally we single out two spatial categories: interior and exterior, whereby each has its own specific characteristics. If in some case, it happens that design concept messes a bit with those commonly established categories, we get to the point where it is hard to clarify the nature of each. We get confused. The boundary is blurred. We get to the space that can be either this or that. We get to the ambivalent space.

This kind of "spatial mess" is particularly characteristic in so called *space within a space concept*, a concept of spatial organization of an architectonic structure that bases its principles on the idea of nesting of a space inside a certain space, i.e. on the insertion of a smaller spatial whole within a larger spatial whole or wrapping a larger spatial whole around a smaller one in a certain sequence. [1] By inserting or wrapping, the architectonic composition of the building becomes layered and the number of layers can vary, depending on a case. Stretching from the inside to the outside, layers create a set of different spatial entities that interact with each other. Those spaces, that are placed between most inner and most outer part of the composition, also called *in between spaces* [2], are usually characterized as ambivalent spaces, because they take over the characteristics of different kind and possess very rich ambient value, which makes them be consider as an important element in spatial organization of the building. Such spaces create particular atmosphere, enhance the user's interaction within the building and reinforce the experience of the space.

This paper has the task to investigate the value of ambivalent space in housing architecture and its importance and contribution to the living comfort. The aim is to find out to what extent such spaces affect the quality of housing space and do they play any important role in the improvement of residents' lives. The paper is based on the short case studies, which will, through the further comparative analysis and synthesis of the obtained results, based on the induction-deduction method, lead to a certain conclusion.

2. SPATIAL CATEGORIES IN ARCHITECTURE

As the space is essential element in architecture, the one that creates architecture and the one that is created by architecture, it remains ever-actual topic. Many authors (Sigfried Giedion [3], Christian Norberg-Schulz [4], Frank Ching [5], Bryan Lawson [6] etc.) dealt with the problem of space. According to Dursun [7], space forms the core of architecture. Although the perception of space is variable category, having in mind that not every individual experiences the same space in the same way, most of the people have the clear idea about the classification of the space into inside and outside domain (interior and exterior).

Finding the similarities that exist between the architecture and nature (in and out), Japanese architect Sou Fujimoto [8], in the most of his projects (House N, House NA, House before House etc.),

confronts those opposites and investigates the relationship between them. As he explains¹¹, nature (whereby nature is not only considered as the physical greenery, but is also the wind, the air, the water, our body itself) and the architecture (manmade environment) are visually completely different or opposite, but the structure behind them is in a sense almost the same. Outside is more nature and inside is more architecture, but what happens, he asks, if we try to blur the boundaries and then the nature and the architecture, the outside and the inside, get closer. Trying to answer this fundamental question, he explores the space in-between opposing ideas: "I like to find something in-between. Not only (between) nature and architecture, but also (between) inside and outside. Every kind of definition has an in-between space. Especially if the definitions are two opposites, then the in-between space is more rich" [9].

German architect Oswald Mathias Ungers, a great part of his work dedicated to the research of the conceptual ideas that lie behind the scene of an architectural structure [10]. Apart from the other themes, he particularly dealt with the *space within the space idea*, or as he called it *doll inside the doll*, where he introduced new spatial categories in the spatial structure of the architectonic composition, as opposite to basic ones.

Many contemporary architects, among which also well-known Portuguese duo Aires Mateus [11], often base their architecture on the confrontation of opposite elements in order to create space of a particular atmosphere, where the structure is no longer consider only as a shelter for those who live inside, but as the place that triggers emotions, experiences and development.

Observing the works of abovementioned architects, it turns out that in many cases, the key moment in an architectonic composition of the structure is actually the space that is maybe not strictly pre-defined or not noticeable at the first glance, but emerges in the field where different, more dominant, elements or influences meet and interact, giving the space specific ambivalent character. Attracted and inspired by this "mystic" moment, it arose the need for a deeper examination of the phenomenon. The topic of ambivalent space is chosen as an interesting phenomenon always actual in the field of architecture. Although it is widely present, here, in the research, the topic is narrowed and focused on the housing architecture, with the main goal to clarify the characteristics of such a space and its importance and contribution to the value of the living space. The problem will be approached mostly from the phenomenological and functional point of view, through the analysis of the projects which were chosen to be present as case studies.

3. CASE STUDIES

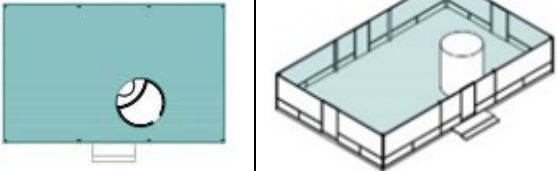
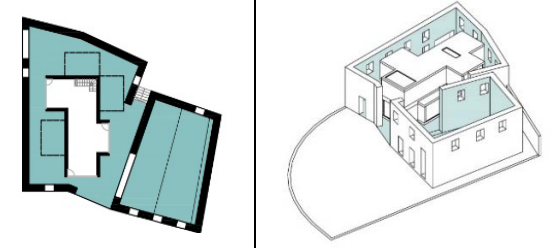
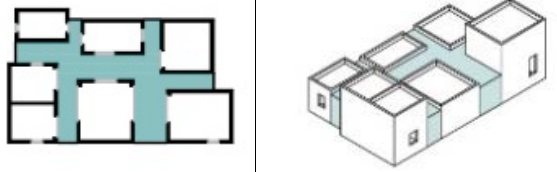
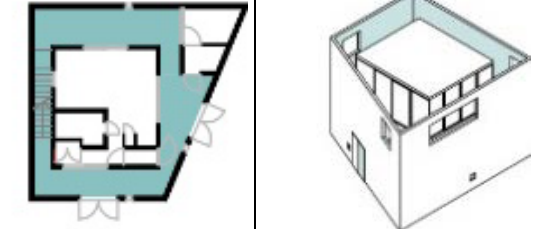
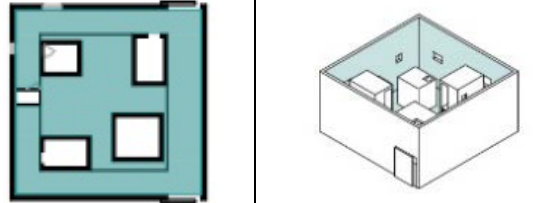
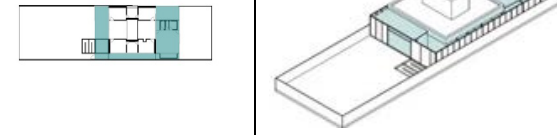
The main selection criteria for the projects was diversity of approaches on the similar recognized topic.

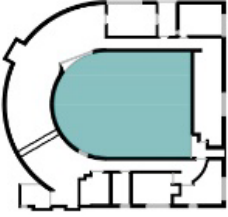
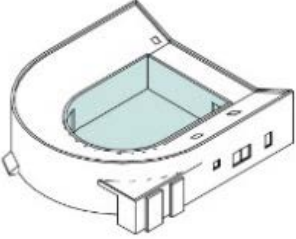
3.1. PROJECT GLASS HOUSE (AUTHOR: PHILIP JOHNSON; LOCATION: NEW CANAAN, USA; YEAR: 1949)

Glass House is one of the best examples in housing architecture where ambivalent space dominates the architecture. Designed as a very simple structure, both in shape and function, it consists of a single transparent volume that unifies the content of the house. Functional organization in Glass House is based on an open-plan, where the functions are combined throughout one continuous space. There are no walls, and the furniture is the only element that defines the areas of use, subtly dividing the house into day and night zone. The only space set aside, as the most private one, is the bathroom, unified together with fire place, hidden inside a bricked cylindrical volume. Since the outer envelope of the house is completely transparent, the views from the interior of the house towards the nature and vice versa are open in all directions, without any barrier. This strong extrovert design approach results with the space that cannot be clearly defined as inside or outside space. Physically it is protected space, i.e. the interior, but visually that space blends perfectly with the surrounding nature, creating a continuum with no boundaries between. One can have a feeling of living outside, while being inside the house. Transparent envelope is present in the composition at the same time to set the boundary between two spatial categories and to allow their constant interaction, creating in this way an in between layer, where residents actually live in a constant symbiosis with the environment. Although the presence of nature is always favorable, the extrovert building yet dictates a radical way of living, which means that this kind of architecture cannot be accepted by every user and is quite subjected to its personal preferences.

¹¹ Urban talks: Sou Fujimoto, The Center for Architecture and Metropolitan Planning (CAMP), Prague, 2019.

Table 1. Tabular presentation of the analyzed projects

PROJECT	AMBIVALENT SPACE <i>*sketches made by authors, based on the architect's drawings</i>		CAUSATION	RESULT
Glass House			- Transparent envelope.	- Strong bound between the living space and the nature
House in Alenquer			- Existing external walls kept from the previous building on a site.	<ul style="list-style-type: none"> - Gradual spatial switch from the inside of the composition to the outside. - Specific experience that gives an impression of the artistic spatial perception.
House in Buzen			- Structural decomposition.	Unification of inside and outside functional contents.
Inside Out House			- Perforated volume around the house.	The house that is the equal home both for people and animals living there.
Light walls House			<ul style="list-style-type: none"> - Extrovert architecture. - Organizational scheme copied from the urban pattern. 	- The mixture of public and private characteristics.
House in a House			- Layered spatial form.	<ul style="list-style-type: none"> - Gradual spatial switch from the inside of the composition to the outside. - Changeable structure that follows the weather conditions.

House U			<p>- Closed introvert U shaped structure.</p>	<p>- The house as a world unto itself. - Spiritual and sculptural expression.</p>
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3.2. PROJECT HOUSE IN ALENQUER (AUTHOR: AIRES MATEUS; LOCATION: ALENQUER, PORTUGAL; YEAR: 2002)

House in Alenquer, the project that in a very original way combines new and old architecture, expresses strong presence of ambivalent space, that comes from the design concept which relies on the direct combination of opposites: existing and new, subtracted and added, solid and void, shade and light.

The architectonic composition is created inside of the perimeter external walls from the old building which are kept and reconstructed [12], while new building, together with a pool, is inserted inside of them. In the conflict of contrasts created by the insertion of one structure into another, emerges the space of a very specific character, which takes on the characteristics of both old and new structures and becomes an important element within a newly created architectonic composition. The existing walls are accepted as an equal element that plays important role in creating a new perception of the old space. This perception should develop itself within the framework of the experience that arises when the new architecture approaches the old one, and when in their temporal encounter interactions appear, as a dynamic trigger of the architectural ambience.

Here, the design concept, based on the space within the space idea, expressed through a combination of existing and new structures, recognizes three spatial levels: the most inner (new house and pool), the most outer (garden) and one between them, defined by the remained walls [1]. This middle layer is the one that gives the particular significance to the architectural value and the one that mixes the characters of all the opposites that have taken part in the creation of the house. Since it emerges at the point where other two layers overlap, it can be considered both as the extension of the outer (like the closed garden) or the continuation of the inner (the open house) area. To be in this space leaves the unique feeling of being at the same time in and out, as well as in the past and present. It is some kind of the connection line that creates particular experience of the space, which also brings the artistic aspect to the spatial perception, having in mind the light and shadow play that is achieved by the perforations of the external shall.

3.3. PROJECT HOUSE IN BUZEN (AUTHOR: SUPPOSE DESIGN OFFICE; LOCATION: BUZEN, JAPAN; YEAR: 2009)

The architectonic composition of House in Buzen is very simple in its form and functional organization. The house is composed of six independent volumes, which are connected by a winding corridor. As the architects describe, the main concept lies on the idea of making *equal the relationship between inside and out by using courtyard as a part of everyday life and bringing inside activities outside* [13].

Except for the volume that combines two rooms for children, each volume fits one room (living room, dining area with a kitchen, main sleeping room, bathroom, wardrobe). The rooms are connected by the glazed corridor that runs around the volumes, simultaneously having a role of a garden and playground.

By the insertion of this glazed connecting volume, the initially compact structure has been decomposed into fragments, where domains of interior and exterior have been overlapped. [14] In this regard, based on the constant integration of inside and outside, a new ambivalent space has been created, where *an interior feels exterior, a private feels public, a hall feels like an avenue* [13].

3.4. PROJECT INSIDE OUT HOUSE (AUTHOR: TAKESHI HOSAKA; LOCATION: TOKYO, JAPAN; YEAR: 2010)

The Inside Out House is a structure designed to equally be home *for a married couple and two cats* [15]. That means, the house should provide a space that, at the same time, fits the humans and animals living together. It resulted in an unusual housing concept, in a set of the arrangements, that combine spaces of different characteristics – those oriented towards the open and enclosed. The

main structure of the composition is created by nesting two smaller volumes inside the one large perforated volume, which is placed on the plot. Perforated volume is the key element in the structure, that starts the spatial play. It works as the membrane between the real outside space and the filtered part that was brought inside, defining the mutual community where cats and people dwell together. Being closed associates to a shelter, while at the same time perforations indicate to a natural environment that penetrates inside. This is the primary house for animals (where they can run, lay beneath the sun, play) and the extended house for people (semi covered garden). Emerged right in the field where two spatial domains intersect, this huge spatial volume creates particular atmosphere that puts out together the characteristics of opposite spaces.

3.5. PROJECT LIGHT WALLS HOUSE (AUTHOR: MA-STYLE ARCHITECTS; LOCATION: TOYOKAWA, JAPAN; YEAR: 2013)

The design of the Light walls House is mainly caused by the location context. Since the plot, where the house is positioned, is very small and shaded by the surrounding buildings, main idea for the design lead to an introverted approach. The composition is completely wrapped inside the solid white cube, closed to the surrounding environment, but open to the sky. Lantern openings bring the diffuse light inside and distribute it around the huge inner open-space area which unifies the functional content in a very specific way. There are no usual partitions that divide the space into rooms, but instead, the interior is organized in a form of the scheme that reminds of the urban organization of the city [16]. More private areas (sleeping spaces) as well as auxiliary spaces are placed inside the enclosed small freestanding volumes, metaphor of buildings, while living and dining areas are conceived to be gathering places, metaphor of squares, and are placed between the enclosed volumes. Other common spaces, like kitchen, work space and wardrobe are lined up along the perimeter of the house. If we simplify the things, it can be said that the main structure of the composition is based on a huge box inside of which are inserted smaller boxes. Because the smaller boxes are visually secured, they retain the higher level of privacy, while the content that is distributed around reflects the sense of public. This content is still in the private space, since it is inside of the house, but compared to other spaces inside, it is placed in public domain of the house. And this is where the ambivalence arises - in the interweaving of public and private, whereby the term public has a dual meaning: the space defined by the external membrane in relation to the urban context is referred to be private, but in relation to the smaller volumes nested inside the big volume it can be comprehend as public.

3.6. PROJECT HOUSE IN A HOUSE (AUTHOR: PLURAL; LOCATION: BERNOLAKOVO, SLOVAKIA; YEAR: 2016)

In the project House in a House, the structure of living space is created by a gradual addition of the spatial layers from the center to the periphery of the architectonic composition. The most central element, the main core of the whole composition, is dining area, designed to be the focal point around which the rest of the functional content is spread, defining the primary living space - the enclosed part of the house. Further on, the enclosed house gradually opens itself to the front and back garden, through the unique transition space, that exudes dual character. This transition, semi open or semi closed space, depending on the point of view, combines content that is, by nature, intended for outdoor space, but since it's wrapped in partly transparent envelope, alludes to indoor space. The layer between the inside and the outside can be at the same time recognized as an open extension of the interior or closed continuation of the exterior. In wintertime, it can have a function of the green house, a winter garden, while during summer, by moving the sliding panels away, it connects itself to the front and back gardens, making a unity with them. In this way, the house follows the weather change, by periodical growth of its domain.

3.7. PROJECT WHITE U (AUTHOR: TOYO ITO; LOCATION: TOKYO, JAPAN; YEAR: 1976)

With the intention to make its own world within the urban context of the busy overcrowded city, the design of White U house uses particular spatial arrangement of a simple form to create an introvert structure compound of different spatial domains nested one within another. It could be said that the concept is mainly influenced by the request to use the living space as a tool that will help in strengthening the connection between family members: *The owner expressed a desire for a visual connection between different parts of the house.* [17] In this regard, the emphasis in the project is given to the symbolic value of the space and therefore comes the circular shape, that results in continuous structure wrapped around the atrium. Here, the atrium is not perceived only as courtyard, but rather as an equal part of the architectonic structure, which takes the important role in the

operation of the house. It can be recognized as an open room within the set of other spaces. Also, it plays another role as a detail that contributes to the spirituality of the building and its sculptural expression, in the game triggered by light and shadows.

4. DISCUSSION

In all projects of the houses, which are shown through case studies, it is recognized the strong presence of spatial categories that reflect a dose of uncertainty and ambiguity. They arise in the parts of the architectonic composition where the overlapping or intersection of certain spatial domains appears. Usually, they are imposed somewhere between clearly defined areas and operate in between, connecting them in a certain way. They may be created for a reason (for example in his works, Oswald Mathias Ungers uses the theme of incorporation called “the doll within the doll” to arrange the building’s organization; he creates the architecture based on the fractal idea of continuous flow where an object continues to turn up inside another object consciously and introduces this idea as a principle of design [10]) or may be the consequence of other circumstances (they appear as an accidental consequence of some other ideas). The researched projects show following causes of the occurrence of such spaces: the tendency to make a strong bond between living space and the environment, the way to band together structures from different contexts, the mode to find the unique space that works for various occasions, the unification of various houses in one single, the answer to the unfavorable location framework, the gradation of living space, spirituality of architectural expression.

Table 2. The main reasons of the emergence of ambivalent spaces in researched projects

PROJECT	REASON OF OCCURRENCE
Glass House	connection of living space and natural environment
House in Alenquer	confrontation of various opposites
House in Buzen	merging of indoor and outdoor functional contents
Inside Out House	overlapping of animals’ and people’s living space
Light walls House	contextual framework
House in a House	gradual shift from interior to exterior
White U	structure’s form

The ambivalent space in Glass House is in the first place caused by its transparency. The house is visually completely exposed to the surrounding area, which contributes the interior space to seamlessly merge with the environment. The nature is considered to be equal part of the house, like other spaces are, and vice versa, the house is conceived as natural element in the wider landscape. However, the strong relationship between the nature and the house, i.e. the close interaction between the living space and the surrounding nature, achieved in this way, causes the low level of privacy, which makes the house not be suitable for general population. The life inside such a space is, to a large extent, subjected to the individual preferences of a person. In Glass House the whole living space is actually ambivalent, except for the separated bathroom.

On the other hand, the ambivalent space in House in Alenquer is generated by the collision of various opposites. It is not only the overlapping of inside and outside domains, but the mutual interaction of different epochs, different shades, different forms. Each of the influencing factors has left its own trace, which lead to the space that radiates the unique atmosphere and experience for the one who finds himself in it. This space alludes also to the artistic moment of the building, giving it a sense of sculptural expression

Ambivalent space in House in Buzen is again caused by the mixture of inside and outside content. The complete organization of the house is subordinated to the merging of functions that are of different nature. What is especially interesting is the way in which the common space is organized. It meanders all around the composition, shaping it and giving it fragmental arrangement. The composition is, in a way, put upside down and the house is actually composed by decomposing [14]. So, also in this case, the ambivalent space expresses the connecting role, whereby the corridor is, apart from its basic purpose, used as garden, playground and rest area. Being in that space means at the same time being in the house and being outside the house. One is neither inside enough, nor outside enough.

In the Inside Out House ambivalent space is the direct result of overlapping of two houses - one adjusted to people and one adjusted to animals. It creates the region that is intended for coexistence of all house members, where animals are equal family members as people. In the intersection area of two houses occurs the space that meets all the needs together. It allows the nature to penetrate

inside to a certain extent – to the extent that is enough to provide the animals with the shelter and people with the garden and to allow them enjoy the sun, the rain, the breeze together within the structure they all call home.

Ambivalent space in Light walls House, caused by the introverted architecture and unusual house plan, primary lies on the gradual shift of private and public ambient inside the same architectonic composition. Gradation of the privacy and its impossibility of accurate definition create the space that is ambiguous and therefore diverse from conventional. The project is interesting because it introduces some new approaches to the housing design, that open up possibilities when it comes to spatial-functional organization of living space. However, being delicate in many aspects and affecting in a great manner the life style of the residents, it is questionable the wide acceptability of this design solution.

House in a House reflects ambient space as a direct consequence of concentric sequencing of different spatial levels between two endpoints. In this gradual sequence, one space slowly changes itself till it turns to other space. The way from the inside to the outside is not direct, but developed step by step through the insertion of spatial layers that enrich the transition way and are in constant interaction.

Finally, the ambivalent space in White U is mainly result of the building's form. The artistic moment, present here, also plays an important role. Solid and void parts of the composition, as well as light effects, have the significant function in the creation of the particular atmosphere that is based on ambiguous character.

Table 3. The colors show the level of influence of ambivalent space on the life in the house – black color represents the highest impact, while white color represents no impact.

PROJECT	THE INFLUENCE LEVEL
Glass House	
House in Alenquer	
House in Buzen	
Inside Out House	
Light walls House	
House in a House	
White U	

Spaces researched here consequently have impact on the life of dwellers. The table 3 shows the level of such impact, which is defined based on the previous project analysis and observation. The result shown in the table may not be fully objective, since the perception of space always lack the objectivity and is influenced by the personal preferences of the viewer's perspective, but is conducted upon the established criterions which tend to be objective in a great manner: the level of user residence in the space, the physical characteristics of the space, user exposure to the space out of the architectonic composition caused by the "ambivalent" zone.

According to the comparison made among researched projects (table 1), based on the motives of the appearance, it can be derived the classification of the structures into few groups:

- the group of structures where the ambivalent space is related to the tendency of connecting the interior space of the house with the environment;
- the group of structures where the ambivalent space is related to the poetic expression of the structure;
- the group of structures where the ambivalent space is related to the gradation of the spaces;
- the group of structures where the ambivalent space is related to the unification of contents of a different nature.

5. CONCLUSION

Existence of ambivalent space in spatial structure of a house can enrich the spatial experience of the architecture. Having in mind that *identity is closely related to the experience of space* [4], this space can be considered as crucial architectonic element in creating balanced and personalized structure. It offers different areas inside the same house under which residents can organize their lives, according to the current wishes and needs. If set in the relation between indoor and outdoor, those spaces act like filters between inside and outside world, between interior and exterior of the house. They can direct the influences from one side to another in a way that is convenient to residents. For

example, they can dose amount of light that can enter inside, the level of visual openness towards the surrounding etc. They create unique atmosphere for stay, that differs from the common one. The most emphasized advantage of such a space is the stronger relationship between inside and outside domains, mainly arranged in a gradual way. There is no sharp boundary, and the transition from one to another point within the architectonic composition is smoot. There are not only black and white, but the whole pallet of spaces is reinforced with the shades of gray that coexist among them.

The bivalent space can be introduced to the design by intention or can be the result of other tendencies or can even be created more or less by chance. Anyway, once set, it affects the internal relations and gives an opportunity to users to choose between the various spatial categories.

Based on the table 3, it can be concluded that ambivalent space influences the residents' life in any case, but depending on the situation, the influence level can be more or less strong. The most powerful impact is noticeable in the situations when its role is to make the link between certain spaces – indoor and outdoor or private and public. As a connecting element, it takes over the characteristics of both sides and, by mixing them, introduces a new spatial category of a very particular character. As it is explained in Elemental living [18], *a fine line exists between those houses that simply speak to their surrounding landscape, and those that both speak and respond to it*, emphasizing the dialogue, as *elementally important* tool, without which *the architecture can feel both anachronistic and out of touch*.

Finally, it can be derived the conclusion that the existence of ambivalent spaces in the architectonic composition of housing building is favorable, because they broaden the opportunities offered by the architecture and create a variety of new spaces that can be enjoyed. That means that they directly affect the development of housing quality and the improvement of residents' lives.

LITERATURE

- [1] H. Krstic, "Research of the architectonic space structure in the domain of housing – space within a space concept", PhD thesis, University of Nis, Serbia, 2018.
- [2] H. Krstic, A. Trentin, G. Jovanovic, "Interior-exterior connection in architectural design based on the incorporation of spatial in between layers", SPATIUM, No 36, pp. 84-91, Dec. 2016.
- [3] S. Giedion, Prostor, vreme i arhitektura – Razvoj nove tradicije, Beograd: Građevinska knjiga, 2012.
- [4] K. Norberg Šulc, Egzistencija, prostor i arhitektura, Beograd: Građevinska knjiga, 2002.
- [5] F. D. K. Ching, Architecture Form Space and Order, New York: Van Nostrand Reinhold, 1996.
- [6] B. Lawson, The language of space, Great Britain: Architectural Press, 2001.
- [7] P. Dursun, "Dialogue on space: Spacial codes and language of space", A|Z ITU Journal of the faculty of architecture, vol 9, pp. 104-119, 2012.
- [8] S. Fujimoto, T. Ito, J. Worrall, "Sou Fujimoto International Architecture Review", 2G International Architecture Magazine, vol. 50, 2009.
- [9] S. Knott (Discussion). "Sou Fujimoto: The spaces in-between.", Internet. <https://architectureau.com/articles/sou-fujimoto-the-spaces-in-between/>, Sep. 25, 2014 [Apr. 29, 2022].
- [10] O. M. Ungers, Architettura come tema / Architecture as theme, Milano: Quaderni di Lotus / Lotus Documents, Electa, 1982.
- [11] General de Ediciones de Arquitectura, "Aires Mateus, Arquitectura 2003-2020", TC cuadernos, vol 145, 2020.
- [12] Aires Mateus Arquitectos, "Works Aires Mateus Arquitectos", Arquitecturas de autor / Author architectures AA25, T6 ediciones, Escuela Técnica Superior de Arquitectura, Universidad de Navarra, España, 2003.
- [13] ArchDaily. "House in Buzen / Suppose Design Office", Internet: <https://www.archdaily.com/50701/house-in-buzen-suppose-design-office>, Feb. 26, 2010 [Feb. 15, 2022].
- [14] H. Krstic, A. Dib, M. Cvetkovic, "House design: making the composition by decomposing", in Proc. PhiDAC 2019, 2019, pp. 117-123.
- [15] ArchDaily. "Inside Out House / Takeshi Hosaka Architects", Internet: <https://www.archdaily.com/560419/inside-out-takeshi-hosaka>, Nov. 18, 2019 [Feb. 15, 2022].

- [16] H. Krstic, M. Cvetkovic, G. Jovanovic, V. Petrovic, S. Spasic Đorđević, “*Home between the house and the city - architectural concept that uses urban pattern for housing design*”, in Proc. ICUP2018, 2018, pp. 131-139.
- [17] Rory Stott. “AD Classics: White U / Toyo Ito”, Internet: <https://www.archdaily.com/345857/ad-classics-white-u-toyo-ito>, Mar. 20, 2013 [Feb. 15, 2022].
- [18] Elemental living, Phaidon, 2016.