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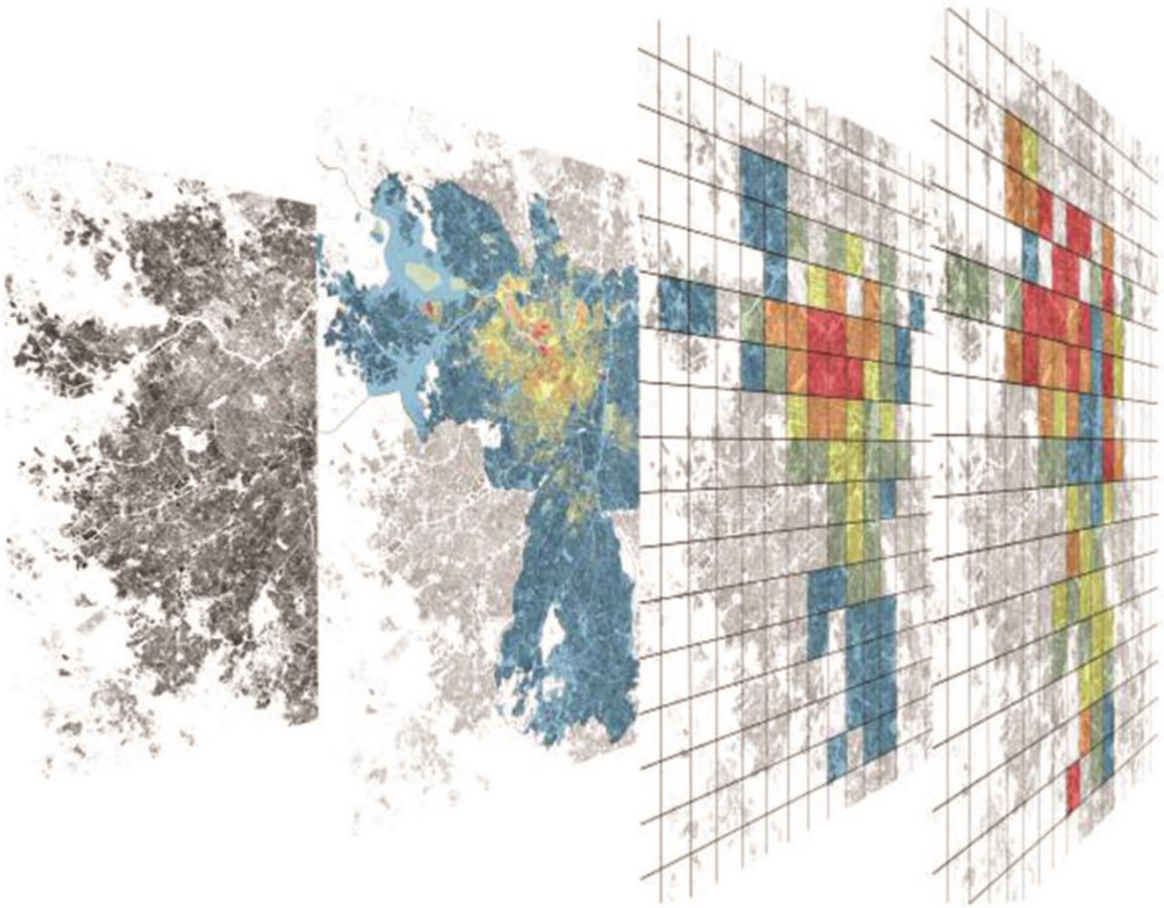

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DAKAM'S
SPRING 2024 CONFERENCES
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DAKAM BOOKS

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ARCHDESIGN ‘24

ARCHITECTURAL DESIGN STUDIES

TRANSLATIONS FROM DRAWING TO TEXT: A STORYTELLING ON DRAWINGS OF LEBBEUS WOODS

ŞEYMA KOCADAĞİSTAN

Şeyma Kocadağistan, Res. Assistant, Mimar Sinan Fine Arts University.

ABSTRACT

Projective architectural representation techniques such as plan, section, elevation and linear perspective, which consist only of lines, can only be used for understanding of the architectural project and the construction of the building. However, architectural representation can mediate not only the construction of a building, but also the discussion of architecture in an interdisciplinary and speculative area. This is possible only by breaking from standard representational techniques, including the integration of different forms of communication techniques such as drawing and text unity in a composition, which is thought to have potential for bringing up the topic of architectural representation to discussion in an autonomous and speculative area. These works, in which different forms of representation coexist, also best exemplify the interdisciplinary areas among painting, literature, architecture and cinema. The main focus of the study is to disclose speculative, imaginative, interpretative and emancipatory aspect of the representation through non-projective representations generally. The study also explores the premise that non-projective representations reveal and reflect the un-buildable and theoretical aspects of architectural representation through the relationship between image-text. Since they disclose the examples where the text-image relationship can be seen most clearly, sketchbook drawings of Lebbeus Woods have been chosen as a case study of the paper. The term "storytelling" is used because it is possible to tell a story through drawing, as a non-projective representations that combines writing and drawing. "Storytelling" which is the methodological term of the study is used to express the drawing in textual terms. In this way, it was aimed to reveal the connections between the visual and the textual, considering that it was a method suitable for the study. The theoretical framework of the study is based on seminal article "translations from drawing to building" written by Robin Evans. Inspired by Evans, who comments on the transitions between building and drawing, it is aimed to reveal the relationships and transitions between "text and writing" by establishing a similar analogy. As a result this study aims to disclose through the non-projective representations in architecture is connected with closer abstract terms as a theoretical forms rather than built-forms as a practical forms of architecture.

Keywords: lebbeus woods, image-text relationship, non-projective representations.

INTRODUCTION AND THEORETICAL FRAMEWORK

Architectural drawings are made for many different purposes, always specific to their time and place: to investigate, speculate, seduce, articulate or, simply, to inform (URL-1, 2024). From this statement, it can be inferred that architectural drawing contains more information than just describing a building project. Robin Evans, in his work The Projective Cast, Architecture and Its Three Geometries, refers to projective drawings as direct transfers in which the object of representation is directly copied. Classical architectural drawings such as plans, sections and elevations are included in this group (Evans, 2000). Drawings other than these are referred to as non-projective representations in this study. The drawings which are among the non-projective drawings and which include both text and drawing are selected as the research object.

The expression "storytelling" is used to describe the drawing as writing, to express it textually. In this study, the term "storytelling" is used since the drawing will be described through writing (or text). In this way, it is aimed to reveal the connections between the visual and the textual, considering that it is a method appropriate for the aim of the study. At the same time, the drawing can be considered a story because it is subjective and autonomous. Since the speculative field of architectural representation can involve time and process, they make it possible to know about its temporal flow. Non-projective architectural drawings can also be written as texts in this respect, they can even be considered as a transitional form between text and image as different tools of architectural representation.

Robin Evans (1997) stated that in his seminal article translations from drawing to building, to translate is to convey. It is to purpose is to shift it without changing it. Such too, by analogy with translatory motion, the translation of languages. Yet the substratum across which the sense of words is translated from language to language does not appear to have the requisite evenness and continuity; things can get bent, broken or lost on the way. I would like to suggest that something similar occurs in architecture between the drawing and the building, and that a similar suspension of critical disbelief is necessary in order to enable architects to perform their task at all. And from this, the study suggests that smilar approach can be considered for the text and drawing and during translation the statement “lost” and “broken” provides opportunity for unique and alternative benefits such as ability to show time and process in the representation area.

Such non-projective kind of representations are thought to be vital because, unlike traditional ones, they make visible unclear sections that are invisible to the eye in the topic of representation. The March-April 2024 issue of architectural design journal with articles on Lebbeus Woods is a case in point for this study. This study is also based on the concept that architectural representation and writing are both forms of "language" used for communication.

There is a very interesting example on the relationship between text and drawing. Oya Şenyurt (2017) states that from the classical era to the late Ottoman period, text and drawing were inseparable. A drawing without text is an object that becomes difficult to understand due to deficiencies in narrative techniques. The fact that writing and drawing were used together as plan indicators in the Ottoman period shows that both tools were considered equivalent in explaining the plan. From the classical period onwards, the relationship between the documents related to designs and short notes or texts is quite tight, and it is seen that "karnâme", which sometimes means drawing sheet and sometimes means a document with written expressions of the drawing, were prepared. Although there are blurred definitions of "karnâme" with different meanings in various documents, this term is mostly used for texts or short notes written in relation to two-dimensional drawings. According to these statements, the methods of representation of the pre-modern world allow the combination of text and drawing to convey and preserve ideas in more detail.

BODY TEXT

Lebbeus Woods’s sketchbook drawings contain both drawing and text. According to the Keller (2024) What mattered most to Woods during these formative years was a desire to make life meaningful by elevating it

'to the level of art': not only to devote oneself to creation, but also to fortify a specific position in relation to the prevalent reality, and the effort required in 'honing one's body, mind, and spirit against it'.

Also, Keller (2024) states that, rather, it appears to capture much of the ways in which these two mediums are intertwined and interdependent in his work. Words are spatial entities, drawn deliberately and carefully across the page's space. Space is inferred not only from drawn lines and bounds, but also from words and sentences; phrases and passages that imply meaning that is as spatial, graphic, and experienced as it is textual and read. Text becomes a drawing, marked and corrected, visualizing through lines that form a language, the methods in which language transforms into lines, only to dissolve, eventually, back into speech.

Woods is an architect who use the sketch as a method of study, frequently dedicating a series of drawings to the development of a single concept. The forms described in his drawings are speculative departures from contemporary architectural production and are not meant to be realized. They reflect Woods' interest in architecture that can envision "new types of space." Following his interest in storms, earthquakes, and sociopolitically disruptive events as sources of inspiration for innovative architecture, Woods creates dynamic forms in reaction to swiftly changing modern urban cultures and settings (URL-2, 2024).

In the first example, we see writing and drawing intertwined. Seen together for the first time, the drawings recall a storyboard. And this supports the expression of storytelling through the combination of text and image. In the Terrain Project drawing by Lebbeus Woods, the composition of complex and overlapping lines has a very abstract character. He has opened random gaps in the text and placed his drawings in it.

According to Tanyeli, Woods' architecture is in no way constructible. Woods developed a discourse and design that does not go beyond the architectural ontology but cannot exist outside of the mediatic field, and with the tools of architecture, he created designs that do not actually refer to 'real' architecture or any concrete phenomenon, but can be described as 'architectural news painting' (Tanyeli, 2000). Based on these statements, it can be said that Woods' drawings have an abstract, internal and subjective characteristic rather than a physical, realistic and concrete context.

Both of these "storytelling" drawings, in which text and drawing become together, can be interpreted as the translation of an idea into writing and drawing. In other words, the idea turns into image or writing in these drawings. And these drawings are as if they are written to be read. In these drawings, sentences and paragraphs on paper can also be considered as spaces in their own right. In Figure 2, we see an example from Lebbeus Woods' work called Terrain project. In this sketch, it can be said that Woods acts in a critical and experimental manner.

Figure 1. A series of drawing of Lebbeus Woods.

Figure 2. Lebbeus Woods, Sketchbooks, from Terrain project, 1999.

CONCLUSION

This complex version of non-projective architectural drawings, integrating text and line, enables observing the process in a way that standard architectural drawings cannot. The advantages of this situation are that it is possible to observe the temporal flow and to see the drawing from an expanded area. With these drawings, it is possible to describe imaginary situations that are impossible to see with the eye. For example, when we read a novel, the spatial descriptions of the author's textual narratives are strongly evoked in our minds, but when we watch a movie version of the same book, what we see remains shallow compared to what we imagine. Based on this situation, it is assumed that the subjective (imaginary) visualisation in the mind is more enriched. Considering that the forms in which text and drawing are together are closer to this richness, it can be said that non-projective drawings in which text and line are together will offer a richer expression as a means of expression.

REFERENCES

Evans, R. (1997). 'Translations from Drawing to Building', in *Translations from Drawing to Building and Other Essays, Architectural Association*, London, pp. 153–194.

Evans, R. (2000). *The projective cast: architecture and its three geometries*. MIT press.

Keller, E. (2024). In Place of Light: On Early Writings. *Architectural Design*, 94(2), 92–101. https://doi.org/10.1002/ad.3039

Şenyurt, O. (2017). *Osmanlı mimarisinin temel ilkeleri: resim ve inşa üzerinden geliştirilen farklı bir yaklaşım*. (2nd Ed.) Doğu Kitabevi.

(URL-1, 2024). https://drawingmatter.org/events/drawing-matter/call-for-submissions-storytellers/ 06.05.2024.

(URL-2, 2024). https://www.moma.org/collection/works/88853 06.05.2024.

Tanyeli, U. (2000). Simulasyon Çağında Mimarlık ve Woods. *Çağdaş Dünya Mimarları: 4, Lebbeus Woods.* s. 7-16. İstanbul: Boyut Publishing.

FIGURE REFRENCES

Figure 1. https://www.friedmanbenda.com/exhibitions/lebbeus-woods-early-drawings/ 09.05.2024

Figure 2. https://www.mutualart.com/Artwork/Six-works--Terrain/694B49891B1534F9 09.05.2024.

SHELTER DESIGN FOR THE HOMELESS IN THE CONTEXT OF QUALITY OF LIFE AND SOCIAL SUSTAINABILITY

MERVE NUR TAŞCI, BETÜL HATİPOĞLU ŞAHİN, AYŞEGÜL TERECİ

Merve Nur Taşcı, MSc, KTO Karatay University, **Betül Hatipoğlu Şahin,** Asst. Prof. Dr., KTO Karatay University, **Ayşegül Tereci,** Assoc. Prof. Dr., Necmettin Erbakan University

ABSTRACT

Throughout history, human beings have needed shelter to survive and be protected against environmental conditions. The sheltered areas have changed according to the changing and developing living conditions of each period. However, due to social, political, economic, environmental and many other factors, individuals have difficulty meeting the need for shelter, which is one of the basic needs of their existence. While some of the individuals who have housing problems continue their lives by finding temporary solutions, some of them are completely deprived of the concept of shelter and are called homeless. Homelessness is a multidimensional, global problem that many countries are struggling with, and today the problem of homelessness is increasing rapidly. Different policies and studies are carried out by international institutions and organisations to stop the rapid increase in the number of homeless individuals and develop permanent solutions. Studies focus on the physical needs of homeless individuals. In addition to physical needs, fundamental issues such as social, psychological, economic, and health concerns also need to be addressed for homeless individuals. In this context, sustainability has become an important concept in every aspect of life, quality of life can be defined as the most general purpose of sustainability as it represents the economic, social, and environmental dimensions of sustainability. When urban quality of life is explained as the reflection of abstract human rights on urban life, the right to housing, which is one of the most fundamental rights, must be provided for every person in the city. "The concept of 'housing right' has been guaranteed by numerous laws and regulations, particularly to fulfil the housing needs of impoverished and low-income individuals. Additionally, in HABITAT II, the concept of adequate housing is defined as "'sufficient privacy; adequate space; physical accessibility; adequate security, structural stability and durability; adequate lighting, heating, and ventilation; sufficient basic infrastructure such as water, sanitation, and solid waste management; appropriate environmental quality and health-related factors; adequate and accessible location in terms of jobs and basic amenities; and the affordability of all these aspects," has been recognised as a fundamental right for every individual across various platforms. Therefore, sustainability and quality of life issues are directly related to the right to housing. While solutions to the spatial problems of homeless individuals are developed with the concept of sustainability, comprehensive solutions to this problem can be developed in the long term by making more conscious approaches to the problem of homelessness socially. In this context, developed for homeless people; Gregory project, James Furzer's award-winning Home for the Homeless project, Shelter with Dignity project and Alexandria Park Tiny Home Village examples will be evaluated and the connections of these buildings with urban life in terms of social sustainability and their quality of life will be discussed. As a result of these evaluations, the solutions offered to the problem of homelessness in Türkiye will be discussed and a framework will be presented for the development of these suggestions.

THE CONCEPT OF SHELTER IN TERMS OF QUALITY OF LIFE AND SOCIAL SUSTAINABILITY

The most important definition of sustainability, which is becoming increasingly significant, is the transfer of the values we own to generations. At this point, this perspective of continuity includes environmental, economic, and social elements together. Although it has been emphasised that sustainability studies should be interdisciplinary and multifaceted and that economic, environmental, and social sustainability should be considered together, social sustainability has not gained enough prominence until recent years (Littig & Griessler, 2005). Social sustainability is defined as a situation in which the social life of a community progresses harmoniously while promoting development, creating quality environments for all segments of the population where cultural and social diversity is integrated and social integration is achieved (Polèse & Stren, 2000). In the urban context, social sustainability is defined as the creation of an urban infrastructure where people can continue their interaction, communication,

and cultural development for a long time. (Yiftachel & Hedgcock, 1993). The sub-components of social sustainability are defined as equality, empowerment, accessibility, participation, sharing, cultural identity and institutional stability (Khan, 1995). In addition, this kind of sustainable development is associated with a good quality of life for all members of society (Hatfield-Dodds & Coggan, 2008). Social sustainability involves establishing the well-being of current and future generations, recognising that the individual is a valued member of the community and has the right to participate and belong to the community. (Castillo, Moobela, Price, & Mathur, 2007) This involves urban development supported by policies and institutions that foster harmonious social relations, promote social cohesion, and improve living conditions for all groups. (Holden, 2012)

The concept of quality of life emerges as a criterion of social sustainability. According to Schalock, quality of life has the capacity to measure the outcomes derived from an individual's life experiences on a societal basis. Therefore, it holds significant importance for detecting sociological changes (Schalock, 2004). Additionally, quality of life is a multidimensional concept that encompasses various components of life situation and existence. Establishing the relationship between these components and analysing the interrelationships are fundamental objectives in quality-of-life research (Masilimani, 2007). At this point, Fadda (2003) defines quality of life as all the needs and requirements of individuals' living conditions. Therefore, physical, economic, spatial, and social factors all become important parameters in determining quality of life. Veenhoven, who defines quality of life as "understanding different aspects of good life," emphasises the direct connection of the concept with social indicators. Furthermore, he indicates that quality of life is an umbrella term, highlighting its multidimensional structure (Veenhoven, 2004).

Marans' study, which holds a significant place in the literature on quality of life, is based on the idea that individuals' personal characteristics and experiences play a crucial role in their perceptions of quality of life. Additionally, the study provides accurate and reliable information that can inform public, institutional, and community policymakers, evaluate changes in community quality of life, and measure societal perceptions. This situation enables the direct connection of quality of life with social sustainability (Marans, 2003).

In examining studies that provide a spatial assessment of quality of life, the concept of urban quality of life prominently emerges. Research on this concept spans various disciplines such as social sciences, natural sciences, health, and engineering, among others. Professions related to the built environment, such as architecture and urban planning, produce studies focusing on urban quality of life. When examining the concept of urban quality of life, it is observed that numerous sub-parameters exist. Particularly, parameters such as access to public facilities, education, healthcare, green spaces, traffic, and population density are measured using both subjective and objective indicators in urban quality-of-life assessments. Upon analysing various datasets, it is noted that "housing, housing and its surroundings, and shelter" are common sub-parameters. Therefore, research conducted on the quality of life based on housing constitutes a significant portion of urban quality of life measurements.

One of the most basic needs of human beings since their existence is shelter. The act of sheltering, which means to exist in a place, covers all the physical, social, and psychological relationships that people maintain with space during their lives (Akdemir Ersoz, 2003). As Ravenhill and Smith (2007) define it, “Home is not just a physical place that provides safety and protection, it is the only personal space that allows individuals to define themselves, a comfortable place where they can be themselves” and goes further than shelter. Home is the place or place where the individual feels free and meets all his/her needs for life, spends his daily life safely, organises his/her plans, expresses himself most comfortably and has social relations (Arnold, 2004). For this reason, the individual needs a home to carry out his/her vital activities.

For individuals, housing is the utilisation of the right to shelter. The right to housing is where individuals can meet their housing needs comfortably, ensuring their security and privacy (Güzel, Okur, 2009). The concept of the welfare state necessitates taking measures to meet everyone's housing needs. In many countries, providing for housing needs through laws and regulations is considered a duty of the state. Additionally, it is the responsibility of the state to provide options, diversity, and accessible housing, in addition to secure and sturdy housing (Balkır, Gönül, 2010). Housing is not merely comprised of a roof and four walls; it is a broad concept that provides security, protection, and both material and spiritual suitability. Therefore, many international platforms offer various assurances regarding the right to housing (TMMOB Ankara Branch, 2013). The Athens Charter, signed in Paris in 1941, emphasised the necessity of creating human-centred, healthy cities, highlighting the importance of organising new urban areas considering people's living conditions, psychological and biological states, and the economic and administrative structures they are part of (Kale, 2013). The Universal Declaration of Human Rights by the United Nations (1948) addressed the right to housing, using the phrase "Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care" (Yalçın and Aslan, 2017). The HABITAT II conference held in Istanbul in 1996 presented a global action plan for sustainable human settlements. The HABITAT II conference held in Istanbul in 1996 presented a global action plan for sustainable human settlements. In this context, the issue of housing was extensively addressed. The third chapter of the report, which contains the commitments section, focused on the topic under the title 'Adequate Shelter for All.' Article 39 acknowledges the obligation of governments to enable people to acquire housing and to protect and improve dwellings and neighbourhoods. It commits to achieving the goal of improving living and working conditions fairly and on a sustainable basis to ensure that everyone has adequate housing free from discrimination, which is healthy, safe, secure, accessible, affordable, and includes basic services, amenities, and comforts, as well as legal security of tenure. The statement emphasises the significant consideration given to the right to housing within the UN framework, demonstrating the importance of this issue (Yalçın and Aslan, 2017). HABITAT II defines adequate shelter as not limited to "a roof over one's head," but also encompassing sufficient privacy, space, physical accessibility, security, tenure security, structural stability and durability, adequate lighting, heating, and ventilation, basic infrastructure such as water, sanitation, and solid waste management, appropriate environmental quality and health-related factors, adequate and accessible location in terms of jobs and basic amenities, and affordability of all these aspects. (United Nations Human Settlements Programme, Habitat Agenda and Istanbul Declaration, Goals and Principles, Commitments, and Global Action Plan, n.d.)

At this point, although many countries have secured the right to housing by the state; The concept of homelessness emerges when access to housing is not possible. It is extremely important to understand homelessness correctly in terms of ensuring both the right to housing and the social quality of life. In addition, social sustainability aims to reduce social inequalities. For this reason, homelessness and architectural solutions for homelessness are important for the purpose of increasing the quality of life.

Homelessness, which is the state of deprivation of the concept of home, is defined as the absence of a personal, permanent, and adequate home. Terms such as rooflessness, houselessness, and insecure accommodation are concepts related to homelessness (Tipple and Speak,2002). In these concepts, the lack of physical elements is constantly mentioned, but one of the important losses is the deficiencies in social

life. In fact, with the loss of physical space, there is also a serious loss of community and social life, and these losses should be considered in solutions to homelessness.

In this part of the study, examples of sustainable housing developed for the needs of homeless individuals around the world is evaluated. Within the scope of the study, Homes for the Homeless, Project Gregory, Shelter with Dignity and Alexandria Park Tiny Home Village are the projects under consideration.

HOMES FOR THE HOMELESS BY JAMES FURZER

The “Homes for the Homeless” project, which won an award in the 'Space for New Visions competition, was designed by designer James Furzer (Dezeen, 2015). Within the scope of the project, it was aimed to provide temporary shelter to some of the approximately 750 homeless people who sleep outside every night in London (Dezeen, 2015). Designer Furzer stated that in order for his design to be applied sustainably in many places, the design can be made with materials suitable for the region to be applied (JFD Architecture, 2024).

Figure 1. Street view of the project (Dezeen, 2015).

Figure 1 shows visual studies of the application carried out in London. Modules were created using lightweight plywood materials in the design. The number of modules varies depending on the area to be applied and the number of homeless people, as seen in the image. Modular cells are placed on the blind facades of existing buildings in a way that does not disturb people walking on the street. Access to the cells is provided by a retractable ladder. Thus, it is aimed at the homeless to meet their needs without being disturbed while they are inside. Thus, it is aimed at the homeless to meet their needs without being disturbed while they are inside.

Figure 2. Interior of the project (Dezeen, 2015).

Inside, there is a wooden bed and wooden shelves for homeless people to sleep as seen in Figure 2. Windows are used for lighting. Attention was paid to the low cost of the materials used in the design. Thus, it is aimed to ensure the sustainability of the project from an economic perspective. With this design, a dry, bright, and sustainable shelter area was created where homeless people can sleep safely. However, even if homeless individuals sleep safely in this shelter, they are deprived of other basic needs such as nutrition and cleaning. When the design is evaluated in terms of social interaction, it offers accommodation without being alienated from other individuals in society. However, no space has been developed for homeless individuals to improve themselves.

PROJECT GREGORY

The Gregory project is one of the examples of shelters designed by Design Develop for the homeless. The scope of the project aims to use the billboards in Slovakia, the visuals of which are shown in Figure 3, by converting them into shelter areas for the homeless (Archdaily, 2024). Thus, it was aimed to evaluate existing areas without creating a new area for homeless people.

Figure 3. Street view of the project (Archdaily, 2024).

The design, which was designed to accommodate two people, has a triangular plan scheme. The design, which was designed to accommodate two people, has a triangular plan scheme. Thus, it was aimed to

develop a solution without affecting the walking axis. Figure 4 shows interior images of the project. The interior includes a raised bed, relaxation area, bathroom, kitchen niche, bookshelf, table, and chairs (Archdaily, 2024).

Figure 4. Interior of the project (Archdaily, 2024).

As seen in the image, the need for ventilation and lighting is met through the windows opening on the rear facades. In addition, the maintenance costs of the project are obtained from the billboards on the facade. With this design, homeless individuals can safely meet their basic needs such as shelter and cleaning. In addition, the integration of the design with the billboard reduces the cost and increases its applicability in many countries. When evaluated in terms of sustainability, it is difficult for homeless people to socially interact with other individuals because billboards are located on the streets, away from people. However, from an economic and functional perspective, it is a positive example for homeless people to live their lives comfortably without negatively affecting society economically.

SHELTER WITH DIGNITY

Shelter with Dignity; It is one of the examples of sustainable shelters designed by the Framlab Design team in New York, where the number of homeless individuals increases rapidly every year. As seen in Figure 5, hexagonal modules are placed on the steel skeleton installed on the empty walls of the buildings with the understanding of vertical terrain (Framlab, 2024). With this understanding, space is saved, and it is aimed for homeless individuals to communicate with other individuals without being removed from society.

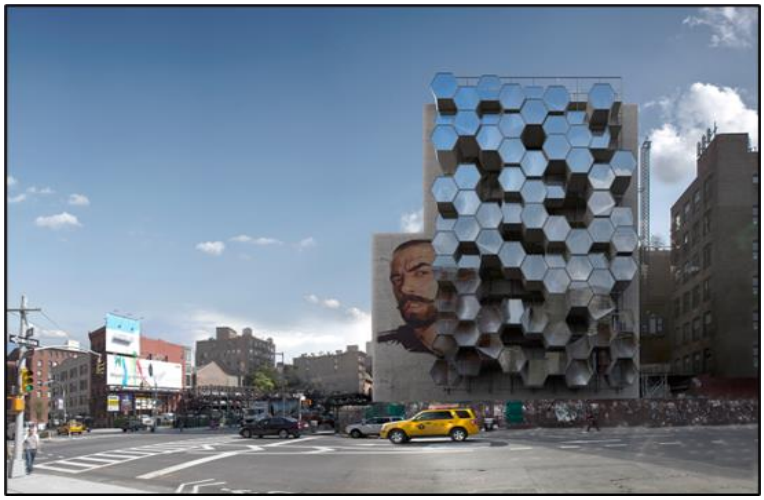

Figure 5. Street view of the project (Framlab, 2024).

Access to the modules is provided by stairs placed on the frame. Sustainable materials were used to reduce the cost of the design and increase its applicability. Looking at the design layers of the shelter, as seen in Figure 5, low-cost sustainable aluminium facade cladding materials that are resistant to bad weather conditions, easy and quick to assemble, were used for the outer shell (Framlab, 2024). Digital content is created with the smart glass system on the front surface of the layers as seen Figure 6. In this way, the income obtained is used to meet the needs of the shelters.

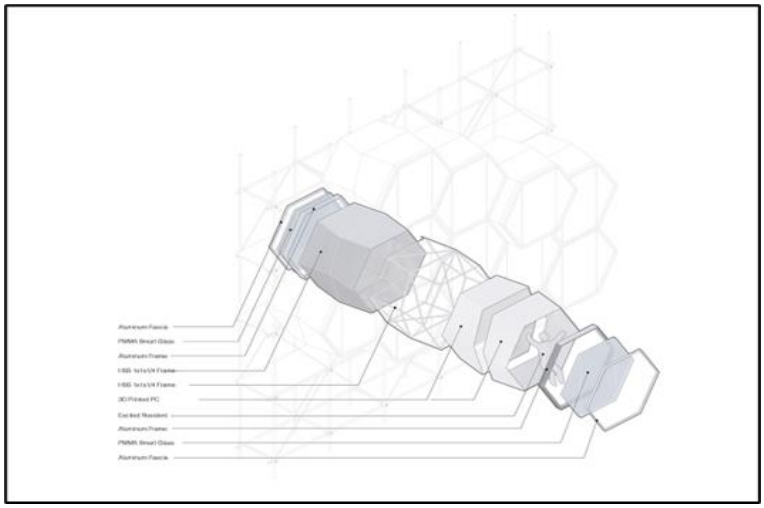

Figure 6. Project Layers (Framlab, 2024).

Each of the modules has different functions and these modules can be combined in different numbers according to the needs of homeless people (Framlab, 2024). Images of modules with different functions are shown in Figure 7. There are 4 different functions in the modules designed for common and individual use.

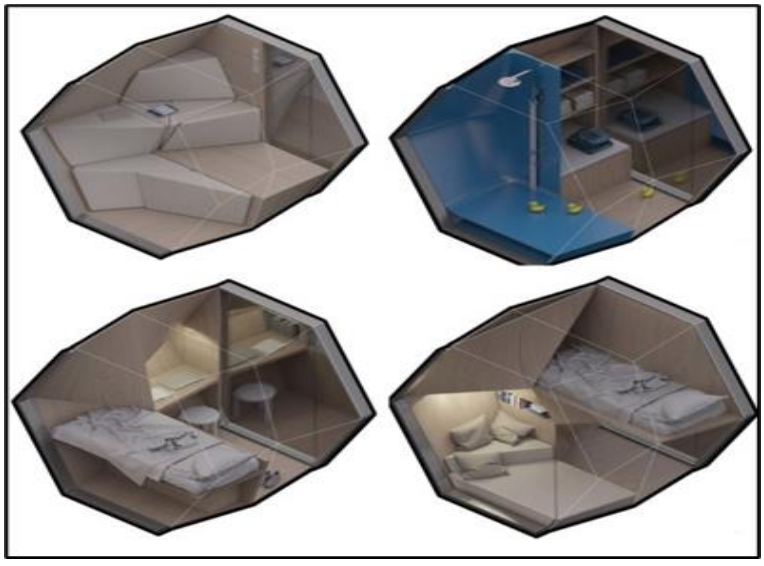

Figure 7. Interior of the project (Framlab, 2024).

It is designed as a double or single sleeping area, bathroom, relaxation area and work area. Sustainable systems have been used in the interior to ensure that it is warm in winter and cool in summer (Framlab, 2024). Thus, it is aimed to provide the comfort conditions and many needs of the homeless. With this design, homeless individuals meet their clean needs such as sleeping, resting, and cleaning by sheltering for a long

time. When we examine it in terms of sustainability, an area has been created where homeless people can meet their physical and psychological needs in a convenient and comfortable way. While creating this area, settlements were made in locations where homeless individuals could have social interaction with other individuals without alienating them from society. Thus, a design that is both socially and economically sustainable has been created.

ALEXANDRIA PARK TINY HOME VILLAGE

Alexandria Park Tiny Home Village was designed by Lehrer Architects to provide housing for homeless people in Los Angeles (Dezeen, 2021). The project consists of 103 micro houses (Dezeen, 2021). As seen in Figure 8, modules were placed in a park next to the highway (Dezeen, 2021). Before this design, homeless people lived in the shade of the trees in this park. Within the scope of the project, existing trees were preserved, and colourful prefabricated modules were placed. The project, which accommodates a total of 200 homeless people, was developed on the theme of creating a neighbourhood.

Figure 8. Top view of the project (Dezeen, 2021).

Prefabricated modules have different functions. It consists of a common dining area, sleeping area, showers, toilets, laundry, and control centre (Dezeen, 2021). Sleeping modules can accommodate one or two people. Modules are 2.4 m^2. Figure 9 shows the interior images of the sleep module.

Figure 9. Interior £of the project (Dezeen, 2021).

Sleeping modules contain only beds. Sleeping modules contain only beds. Thus, the opportunity to establish social interaction without moving away from other individuals is provided. Located in a hard-to-reach and abandoned area, this project aims to revitalise the area and provide safe and controlled shelter for homeless individuals. With this design, homeless individuals can meet many of their basic needs such as shelter, cleaning, food, and work. In addition, the prefabricated village in Los Angeles, consisting of single-storey-coloured modules integrated with a colourful floor, attracts the attention of other individuals in the society. This interest provides opportunities for homeless individuals to communicate with other individuals without being isolated from society or feeling inadequate.

CONCLUSION

Today, the problem of homelessness is increasing rapidly due to changing living conditions. Unique spaces are needed to eliminate the housing problems of homeless individuals and to minimise the problems experienced by them. For this purpose, solutions to their spatial problems are developed in many countries by designs with different forms and functions. Since most of the studies are temporary solutions focusing on the physical needs of homeless individuals, adequate solutions cannot be produced for the social and psychological needs of homeless individuals. Meeting only the sheltering needs of the homeless is not a sufficient solution. For this reason, when designing, it is necessary to first understand and recognise the homeless and to determine their social and physical deprivations comprehensively. In line with the deprivations of the homeless, special areas should be designed where they can meet their basic needs, feel safe and meet their comfort needs. Especially in today's cities where social isolation is intense, area solutions where people who cannot find shelter for various reasons can meet their basic needs, even temporarily, should be made without removing these people from the city. Without ignoring the lives of the homeless in the city, creating spaces that they can access in public spaces can only be possible if the city exhibits a holistic behaviour model. As seen in the analysed projects, problems should be solved without social segregation in the existing area. Establishing social connections in the process of socialisation of the homeless is as valuable as finding a job and this should be shaped within the framework of the area they live in.

REFERENCES

Akdemir Ersoz, Z. ,2003. Barınma Arketipleri ve Bir Simge Olarak "Ev". Tasarım Kültürü Dergisi, 124-128.

Arnold, K. R., 2004. Homelessness, Citizenship, and Identity: The Uncanniness of Late Modernity. New York: State University.

Adam, D.J., 1984. *Stakeholder analysis.* 2nd ed. Oxford: Oxford University Press.

Archdaily, 2024. https://images.adsttc.com/media/images/5458/b7b7/e58e/ce4c/0800/02a9/large_jpg/night1a_copy.jpg?1415100338

Balkır, Z. Gönül. 2010. "Konut Hakki Ve İHlalleri:Kentli Haklarinin Doğuşu." Sosyal Haklar Ulusal Sempozyumu, Kocaeli, Türkiye.

Birleşmiş Milletler İnsan Yerleşimleri Merkezi, Habitat Gündemi Ve İstanbul Deklerasyonu,Hedef Ve İlkeler, Taahhütler Ve Küresel Eylem Planı." n.d. Birleşmiş Milletler İnsan Yerleşimleri Konferansı Habitat Iı,Başbakanlık Toplu Konut İdaresi Başkanlığı, Ankara.

Castillo, H., Moobela, C., Price, A., & Mathur, V., 2007. Assessing Urban Social Sustainability: Current Capabilities and Opportunities for Future Research. International Journal of Environmental, Cultural, Economic, and Social Sustainability: Annual Review, 39-50.

Dezeen,2021. https://static.dezeen.com/uploads/2021/04/tiny-home-village-for-the-homeless-lehrer-architects -loss-angeles-architecture-usa_dezeen_1704_col_2-852x546.jpg

Dezeen,2015.https://static.dezeen.com/uploads/2015/08/Homeless-shelters_JamesFurzer_dezeen_4_1000.jpg

Güzel, A., Okur, A. R., Caniklioğlu N. 2009. "Sosyal Güvenlik Hukuku." In Beta Yayınları. İstanbul.

Fadda, G., 2003. Urban sustainability, quality of life and gender. ın city and gender - International Discourse on Gender, Urbanism and Architecture. U. Terlinden. Opladen, Germany, Leske + Budrich: Ss. 177-190.

Framlab., 2024. https://www.framlab.com/swd

Hatfield-Dodds, S., & Coggan, A., 2008. The pursuit of happiness: sustaining human wellbeing. Ecos.

Holden, M., 2012. Urban Policy Engagement with Social Sustainability in Metro Vancouver. Urban Studies, 527-542

Kale, F. 2013. "Uluslararası Ve Ulusal Boyutlarıyla Konut Hakkı." Yüksek Lisans Tezi, Ondokuz Mayıs Üniversitesi, Sosyal Bilimler Enstitüsü, Samsun.

Khan, M., 1995. Sustainable development: The key concepts, issues and implications. International sustainable development research conference (pp. 63-69). Manchester, UK: Sustainable Development.

JFD Architecture, 2024. https://www.jfdarchitecture.com

Littig , B., & Griessler, E.,2005. Social Sustainability: A Catchword between Political Pragmatism and Social Theory. International Journal of Sustainable Development, 65–79.

Marans, R. W., 2003. Understanding environmental quality through quality-of-life studies: the 2001 DAS and its use of subjective and objective indicators, Landscape and Urban Planning, 73–83.

Masilimani, R., 2007. People's perception of quality-of-life concept in urban development process: Case Chennai. Anna Üniversitesi, Mimarlık ve Planlama Fakültesi, Chennai.

Polèse, M., & Stren, R., 2000. The Social Sustainability of Cities: Diversity and Management of Change. Toronto: University of Toronto Press.

Ravenhill, M., & Smith, J., 2007. What Homelessness? A Report on the Attitudes of Young People and Parents on Risk of Running Away and Homelessness in London. London: Metropolitan University and Centrepoint.

Schalock, R. L., 2004. The concept of quality of life: What we know and do not know. Journal of Intellectual Disability Research. https://doi.org/10.1111/j.1365-2788.2003.00558.x

Tmmob Mimarlar Odası Ankara Şubesi, 2013. "Elverişli Konut Hakkı Bir İnsan Hakkıdır." Konut Hakkı Sempozyumu.

Tipple, G., and Speak, S., 2004. Definitions of Homelessness. Habitat International, 3, 337-352

Veenhoven, R., 2004. Quality-of-life research. 1949, 1–23.

Yalçın, Enes, And Selçuk Aslan. 2017. "Konut Hakkı Ve Konut Sektörüne 2013-2016 Dönemi Konya Özelinde Bakış." Selçuk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi.

Yiftachel, O., & Hedgcock, D., 1993. Urban social sustainability: The planning of an Australian city. Cities, 139-157.

SPATIAL ANALYSIS OF APARTMENT BLOCK PRODUCED THROUGH COOPERATIVES: KONYA'S MODERN BUILDINGS BETWEEN 1950-1970

AYŞENUR DAĞ GÜRCAN, ALİ ŞAHİN, MERVE ATMACA ÇETİNKAYA

Ayşenur Dağ Gürcan, Lecturer, KTO Karatay University/Department of Architecture, **Ali Şahin,** Lecturer, KTO Karatay University/Department of Architecture, **Merve Atmaca Çetinkaya,** Lecturer, KTO Karatay University/Department of Interior Architecture

ABSTRACT

Starting from 1950, Konya witnessed rapid population growth, leading to a surge in the construction of apartment blocks. During this period, residing in the apartment became a symbol of status, with traditional houses being demolished to make way for these modern buildings. Cooperatives played a significant role in the production of these apartment blocks, marking a crucial phase in Konya's urban development.

This study focuses on three iconic apartment buildings constructed in Konya after 1950 by architects from Istanbul and Ankara: Yonca, Horozluhan, and Yeşil Meram Apartments. These buildings, constructed in 1957, 1965, and 1967 respectively, occupy prominent locations on key streets within the city. Yonca Apartment is situated in the Abdülaziz Neighborhood, which saw an influx of immigrants between 1950-1960. Horozluhan Apartment stands on Feritpaşa Street, running from the train station to the monument statue, offering views of the old city stadium. Yeşil Meram Apartment, meanwhile, was located on the newly opened Nalçacı Street between 1963 and 1970. These buildings, located in the same city and a similar period, were designed by nationally recognized architects. The study aims to identify the similarities and differences in these modern apartment-type housing in Konya.

The spatial analysis of these buildings, which are the original apartment building examples of the period, has been made and the space syntax has been utilized as a method. In the analysis method, three aspects are discussed: the relationship between the building and its parcel, circulation within the apartment block, and the configuration of apartment plans. The analysis of building-parcel relationships involves evaluating the layout plan and the connection between the block- the building entrance - and the street. Block type and circulation areas were analyzed for apartment blocks. On the other hand, justified plan graphs and isovist fields were obtained on the apartment plan. Furthermore, visibility graph analysis (VGA) was conducted across all three aspects, measuring visual integration, connectivity, entropy, and mean depth values. These data facilitate a comparative analysis of the three modern apartment-type housing, highlighting their commonalities and distinctive features.

Keywords: Apartments, Apartment blocks, Space syntax, Konya, Modern housing

1. INTRODUCTION

After 1950, rapid urbanization and the spread of apartment blocks directly affect both the structure of the city and social life. The city of Konya, which grew in a planned manner, still bears the traces of this planning and the buildings belonging to this period. Within the scope of the study, 3 apartment buildings that are still actively used and important for both Konya and Turkish architecture were identified and evaluated through their plan schemes. An important point about the building sector in Konya is that cooperative housing production is frequently preferred. Another reason for the selection of the 3 buildings is that these buildings were built through cooperatives.

Space syntax analysis was preferred for the analysis and evaluations made on the apartment plans because it produces objective and quantitative data. Space syntax is a method frequently used to investigate the social factors in the formation of plan typology. The selected apartment buildings are quite different in terms of design character and plan solutions. By comparing the results of the space syntax analysis for all three buildings, answers to the following questions were sought: Is there a post-1950 plan typology for Konya apartment buildings? What are the similarities and differences between the selected apartment buildings in terms of plan and lifestyle?

2. COOPERATIVELY PRODUCED APARTMENT BUILDINGS IN KONYA

After World War II, the increasing industrialization movement in Turkey and around the world led to an increase in migration from rural to urban areas. In the post-1950 period, the housing problem increased with the increase in the urban population (Hatipoğlu Şahin & Dağ Gürcan, 2021). In order to meet the need for housing, two different types of housing provision emerged. The first is the non-profit cooperatives, municipalities, social security institutions, and the Housing Development Administration of the Republic of Türkiye (TOKİ); the second is the for-profit, small, capitalized constructor and large capitalized private housing providers (Alkan, 2015).

The cooperative, one of the non-profit housing providers, is derived from the Latin word “cooperatio”. This word means to cooperate (Güney, 2009). The International Labor Organization (ILO) defines a cooperative as follows: “an autonomous association of natural persons and/or legal entities who voluntarily come together to meet their common economic, social and cultural needs and aspirations through a jointly owned and democratically controlled enterprise” (ILO, 2022). According to the Turkish Cooperatives Report (2017), the cooperative enterprise model works in many disciplines where broad mass participation is ensured. Cooperatives are active in areas such as housing and agricultural production, education and health services, transportation, and transport.

The first housing cooperatives in Turkey were established in 1887 in Istanbul with members of the British minority. The Republic of Turkey's first cooperative experiment was the Ankara Bahçelievler Cooperative in 1934. In 1926, the Turkish Commercial Code and various laws encouraged cooperatives (Keleş, 2013). There were two steps in the establishment of housing cooperatives. The first step started in Ankara in the mid-1930s and spread across Turkey in the 1950s. The founding purpose of the Ankara Bahçelievler Building Cooperative was to make homeless civil servants homeowners (Koç, 2022). Because the value of land in Ankara increased rapidly in the 1930s, the possibility for middle class civil servants to build a house on their own land decreased significantly. This obstacle was overcome for the first time with the Bahçelievler Building Cooperative. This made it easier for them to obtain loans from the Emlak and Eytam Bank. Thanks to the housing cooperative, situations that were difficult to overcome individually were solved with the help of institutionalized relationships (Tekeli, 2009). Agricultural and consumer cooperatives, which were effective between 1923 and 1930, were put into practice to solve the housing problem. In this way, Ankara's housing need was tried to be solved with the help of cooperatives. Between 1930 and 1940, a total of 56 housing cooperatives were established across the country, mainly in Ankara, Istanbul and Izmir. In the 1940s-1950s, housing cooperatives were tried to be established through legal regulations. The Emlak

Bank of Turkey started to provide housing loans to state employees. However, upper-income civil servants benefited in the first phase. Attempts were made to establish housing cooperatives in Anatolia for workers and low-income civil servants (Bakır Doğru, 2020).

The second stage of housing production occurred after the 1960s. With this step, the planned period was established and the law on condominium ownership was passed in the same period. In the planned period, Sosyal Sigortalar ceased to distribute housing funds through the Emlak Kredi Bank. Instead, it used its own organization (Tekeli, 2009). Although there were periods of stagnation or regression, housing cooperatives became one of the most important experiments. In 1960, there were around 1,750 housing cooperatives (Keleş, 2013), and in 2021 there are estimated to be around 55,000 (Url-3, 2024).

In 1960, with the condominium law, the number of houses built by cooperatives in the country increased. One of the cities affected by these activities is Konya. During this period, the periphery of the city expanded and streets such as Nalçacı were opened. Higher buildings were built compared to previous houses (Hatipoğlu Şahin & Dağ Gürcan, 2021). While Konya gave its first apartment building example in 1937, the number of apartment buildings in the city increased after the 1950s (Arat & Kaçar, 2021). In this period, well-known architects such as Hulusi Güngör, Vedat Dalokay, Şevki Vanlı and others produced works in Konya. These architects, who produced 3 important cooperative apartment buildings of Konya, designed Yonca Apartment (1957), Horozluhan Apartment (1966) and Yeşil Meram Apartment (1967) respectively.

2.1. Yonca Apartment

Designed by Master Architect Hulusi Güngör, Yonca Apartment is located in Abdülaziz Neighborhood, where immigrants were settled between 1950-1960. This building was built in 1957 by the Konya Bahçeli Evler Building Savings Cooperative. It is also one of the examples of modern architecture built during the Republican period.

Yonca apartment building was divided into a total of 42 independent apartments with the condominium law in 1968. It is also the first apartment building of the period to have an elevator and central heating together (Şen, 2021). The facade of the building seen in Figure 1 has a variety of color palette as it was painted later. However, the blue mosaics on the facade still preserve their originality. The plan scheme seen in Figure 2 emerges with the combination of three triangular masses coming together at various angles around the core. The triangular form seen in the plan scheme is seen both on the façade and in the details inside the building. Triangular railings, triangular windows and triangular directional elements showing the apartment numbers on the floor inside the apartment building are examples of this (Url-1, 2024). This 7-storey apartment building also has a basement. There are two storerooms, a laundry and drying area, a coal cellar and a heating section (Şen, 2021). There are intermediate elements such as elevator, garbage and fire chimneys and skylights between both apartments. The building has a circular core and a marble-coated structural system (Url-1, 2024).

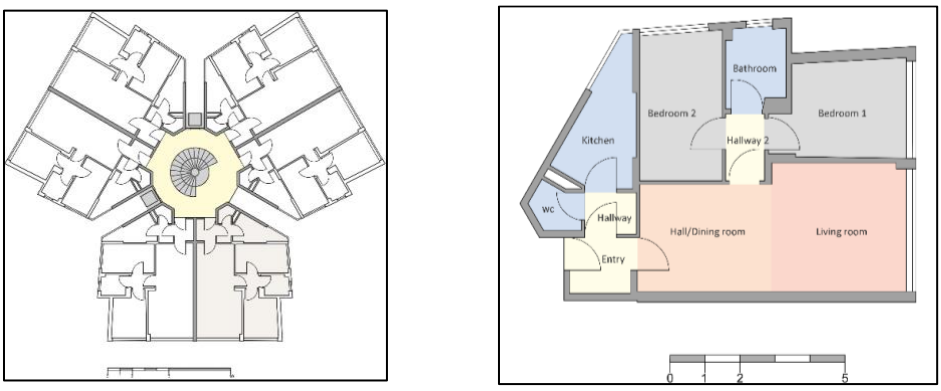

Figure 1. Plan diagram of Yonca apartment building

Figure 2. Facade view of Yonca apartment building (Url-1, 2024)

Yonca Apartment has a total of 42 flats with six on each floor, each flat is 2+1 and each is approximately 77 m^2. The entry is connected to the kitchen and WC with the help of a hallway. The garderobe is placed in this hallway. A connection from the entry to the living room is established with a different hallway. This hall is connected to the living room and also functions as a dining room. From this dining room/hall, two bedrooms and a bathroom are reached through the corridor. In this floor plan example where the living room and the quest hall are not separate spaces, it is seen that the children's room is designed as a specialized space. The small kitchen concept of the early 1950s is seen and this corridor-type kitchen solution does not include table furnishings (Arat & Kaçar, 2021). In addition, built-in wardrobes were used in the bedroom and hallways as a modern alternative to traditional closets (*yüklük*).

2.2. Horozluhan Apartment

Konya Cooperative Apartments was established by Osman Bibioğlu, director of DSİ and 11th term Konya MP. Horozluhan apartment building was built in 1966 by Vedat Dalokay in connection with this organization. Horozluhan Apartment Building is located on Feritpaşa Street extending from the train station to the monument statue and overlooks the old city stadium. This building is another modern cooperative apartment building constructed in Konya during the Republican period.

The building shown in Figure 3 consists of two rectangular blocks and these blocks are connected to each other by a staircase. There is also an elevator connecting the floors. The 7-storey apartment building has shops at the entrance. Each shop has its own entrance. Apart from the shops, there is an apartment belonging to the building attendant and 2 residences on the ground floor. There are 3 flats on the other 6 floors, totaling 40 apartments in two blocks. There are two different plan types on the upper floors (Şen (b), 2021).

Each apartment is approximately 150 m^2 in the block where two flats are located opposite each other. The residence consists of three rooms, a living room, a dining room and service units, and is connected to the kitchen, living room and hall from the entry. In front of the kitchen unit, there is an office room for storage purposes. Depending on the understanding of the period, the living room and the guest room have been solved with two uses *(salon-salomanje)*. In addition, a hall in the center of the house is also designed as a dining room. From here, an independent room and a night hallway are accessed. In the hallway, there are bedrooms, bathroom-wc and a chest room for storage purposes as seen in the buildings of the period. In addition, there are built-in wardrobes in the bedrooms and hallways. The apartment has access to balconies from all rooms.

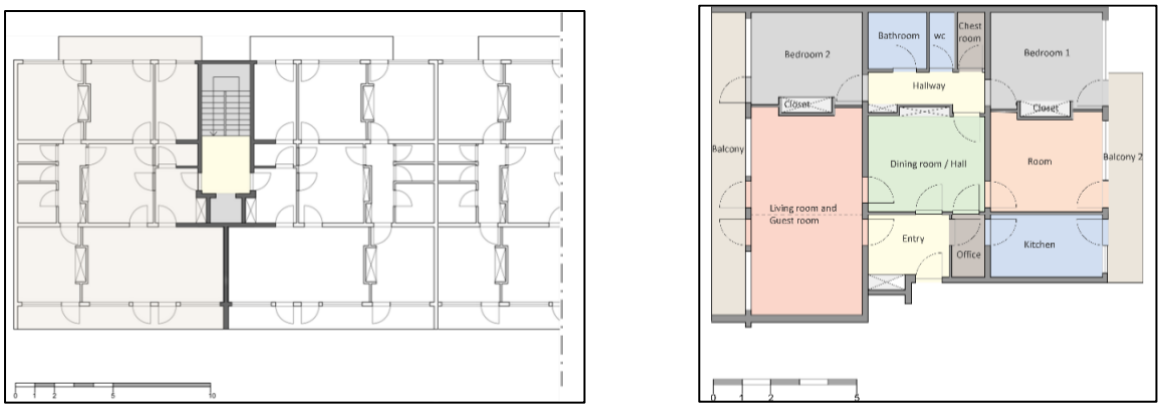

Figure 3. Horozluhan apartment building plan diagram

Figure 4. Horozluhan apartment building facade view (Google street view, 2023)

While the exterior of the building is covered with stucco, tile, marble mosaic and parquet are used in the interior. While the recessed balconies are in the foreground horizontally on the façade, the vertical staircase connecting the two masses is recessed into the background (Şen (b), 2021). Some of the balconies, which were originally planned to be recessed, were later closed with glass by the users living in the residence. The facade image is shown in Figure 4.

2.3. Yeşil Meram Apartment

The last cooperative building that constitutes the scope of the study is the Yeşil Meram Apartment. This building is located on Nalçacı Street, which was newly opened between 1963 and 1970. Before the residential settlement was built on this street, there were vineyards around it and the area was known as "Sille Bağları".

Yeşil Meram Apartment is a modern cooperative building designed by Şevki Vanlı in 1965. While most of the building was completed by the contractor Nazif Yardımcı, the process was then handed over to another contractor. Thus, the building was completed in 1967 and the official construction date is known as 1967. The building shown in Figure 5 has a 13-storey asymmetrical and "L" shaped plan scheme with stairs and elevator connections at three different points attached to the outdoor horizontal circulation that provides access to the residences (Alagöz, Semerci, & Aydın, 2015). With the Yeşil Meram Apartment, it was ensured that all apartments face the front facade and it was aimed to establish a single transportation core. By shifting the sleeping areas on top of each other, the apartments could come side by side on the smallest

facade, while all house entrances could be provided from a single gallery (Url-2, 2024). In order to better understand the facade, we can look at Figure 6.

In the apartment block with open circulation area, the flats are accessed through a vestibule reached by three steps. In some flats, this section was later closed. The flats, each of which is approximately 100 m^2 in gross area, are first encountered with a narrow entrance hall. To the right of the entrance, there is a space delimited by angled walls and functioned as a living room. The living room opens to the balcony and establishes a relationship with the interior and exterior. The room, which has an entrance from the hallway, is also connected to the living room. This situation contributed to flexible use by allowing the living room and the room to be joined and separated as needed. To the left of the entrance hall are wet areas. The kitchen faces the open corridor of the block and consists only of counter space. The dining table is located in the living room close to the entrance. Next to the WC and bathroom there is a deep closet area. A second hallway connects to the two bedrooms. In the master bedroom, the window extends to the floor. This window is associated with an angled and narrow open space (Alagöz, Semerci, & Aydın, 2015).

Figure 5. Yeşil Meram house plan diagram

Figure 6. Yeşil Meram residence facade view (Url-4, 2024)

The common characteristic of these three apartments built by cooperatives between 1950-1970 is that they are new apartment building approaches shaped by modernism. Produced by architects from Istanbul and Ankara, these apartment buildings have become important representatives of modernism in Konya with their unique lines and various spatial needs of the residential buildings of the Republican period.

3. METHODOLOGY

The apartment buildings examined within the scope of the study have different plan schemes from each other, although they were built in recent periods. At this point, the spatial sequence contains very convenient methods of analysis and measurement in terms of comparison. This method, which aims to understand the social logic of the formation of space and serves to read space, is frequently preferred in

studies of examining and comparing spatial change (Guney & Wineman, 2008; Şalgamcıoğlu & Ünlü, 2013; Mansouri & Ünlü, 2018), typo-morphology research (Orhun, Hillier, & Hanson, J. 1995; Malhis, 2017; Şen & Baran, 2020), and concept-focused studies such as centrality-flexibility (Dawes, Ostwald, & Lee, 2021) and privacy (Nejadriahi & Dincyurek, 2015; Alitajer & Nojoumi, 2016; Pourvahidi, 2020; Zabihi & Mirzaei, 2023).

Space syntax analysis aims to present permeability, accessibility, and visibility criteria in structural and urban spaces as numerical data (Hillier, 2014). The main values used to measure these criteria within the analysis method are connectivity, mean depth, and integration values. If the relationship between the connectivity value and the integration value shows a directly proportional development, the structure is a readable and understandable system, and the spatial relationship is interpreted as strong (Hillier and Hanson, 1984). On the other hand, there is an inverse relationship between depth and integration values; as the depth of space increases in the plan plane, the building has a discrete spatial system. This relationship of values, which explains the basic working and interpretation logic of space sequence management, will be used in the evaluation of the analyses of this study.

Space syntax focuses on the configurations and relationships between spaces. Justified graphs, isovist field, and visibility graph analyses were used to define these relationships. Connectivity, depth, and integration analyses were performed using graph diagrams with the representation of interconnected spaces. While isovist analysis analyzes the change in the angle of view of a person moving in space, visual connectivity, visual depth, and visual integration values between spaces were calculated with visibility graph analysis.

In the study, the Agraph program (Manum, 2009) was used for graph analyses, and the open access DepthmapX program, updated by Turner et al. in 2010, was used for isovist and VGA analyses (Turner et al., 2001; Turner, 2001). The structures whose plans were accessed were drawn to scale in vector DXF format with the Autodesk Autocad program. These drawings were then transferred to the analysis program and spatial relationships were entered into the system and visibility (VGA: visibility graph analysis) and isovist maps were defined. All analyses were performed on apartment plans. At this point, visual connectivity, visual integration, visual mean depth, and visual entropy values were analyzed for an apartment and all its spaces. During the visibility analyses in the study, the grid size determining the cell scale was chosen the same for each sample and this size (in cm) was determined as 20. In this way, it was possible to make measurements under equal conditions in all buildings for the analysis. VGA analyses were performed on a global scale by entering an n value. In the co-vision field (isovist) analysis, the field of view analysis from the apartment entrances was performed by choosing a 360-degree perspective.

4. SPACE SYNTAX ANALYSIS OF APARTMENTS

The three apartment buildings examined within the scope of the study were first analyzed separately, and the data of all independent sections within the spatial system were evaluated within themselves. Then, the analysis data of the three examples based on apartments were compared.

Looking at the Yonca apartment, as can be seen in Table 1 and 2, the unit with the highest total and mean depth value was the wc, while the shallowest spaces were the hall/dining room and the entry, respectively. The hall/dining room has the highest integration value, followed by the entry and Hallway 2. The lowest integration value was wc, followed by bathroom and bedrooms. Regarding visual connectivity and integration values, the highest value was again the hall/dining room, followed by the living room, entrance and hallway 2. The lowest values were for wc and kitchen. Regarding the visual mean depth value, the hall/dining room had the lowest value, followed by the living room, hallway and entry. The highest values were for wc and kitchen. While the kitchen and bedroom 2 have the highest visual entropy value, the hall/dining room has the lowest value. In line with the data obtained here, the most integrated and accessible spaces in the apartment are the hall/dining room and living room. These spaces were followed by circulation areas. This situation is supported by the fact that they are the most active spaces of daily life. The fact that the deep spaces in the house are wc, bathroom and bedrooms coincide with the privacy

requirements. The high entropy of the kitchen in the spatial system may be because this space is located close to the entrance but has an indirect connection with it. This has led to an increase in the depth of the kitchen and a decrease in its visibility, making it difficult to understand this space.

Yonca Apartment	Justified Graph Output via Agraph			Visibility Graph Analysis Output via Depthmap			
	Total Depth (a.v.)	Mean Depth (a.v.)	Integration (a.v.)	Visual Connectivity (a.v.)	Visual Integration (a.v.)	Visual Mean Depth (a.v.)	Visual Entropy (a.v.)
Entry	18	2	4	552,58	9,12	1,93	1,54
Hall / Dining room	16	1,77	5,14	723,21	12,61	1,67	1,33
Hallway	23	2,55	2,57	260,67	6,01	2,37	1,76
Kitchen	24	2,66	2,4	230,47	5,32	2,54	1,88
Wc	31	3,44	1,63	107,21	4,81	2,78	1,64
Living room	24	2,66	2,4	682,82	10,85	1,76	1,46
Hallway 2	18	2	4	539,28	10,07	1,81	1,43
Bedroom 1	26	2,88	2,11	345,53	7,01	2,18	1,68
Bathroom	26	2,88	2,11	228,87	7,38	2,13	1,38
Bedroom 2	26	2,88	2,11	312,68	6,15	2,33	1,85

Table 1. Analysis results of Yonca Apartment, a. v. Average value

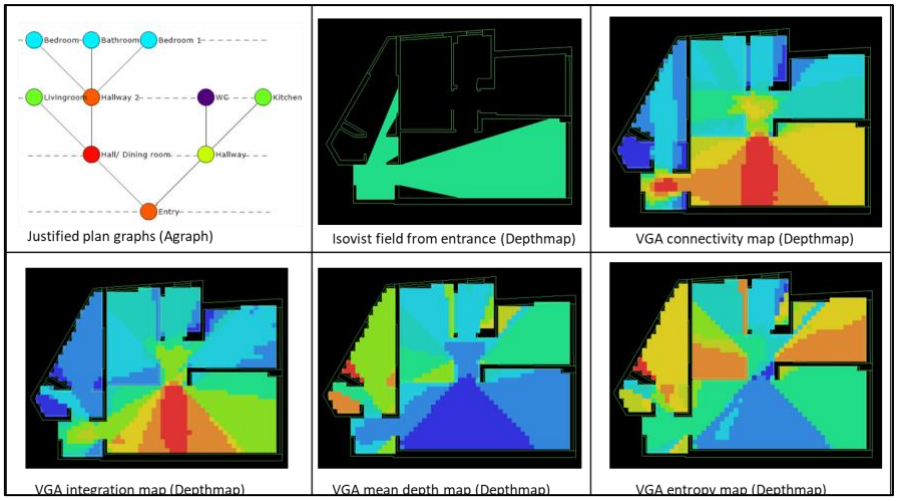

Table 2. Spatial analysis of Yonca apartments

Looking at the Horozluhan apartment building, as seen in tables 3 and 4, the units with the highest total and mean depth are balcony 2 and kitchen. At the same time, the shallowest spaces are the hall/dining room, hallway, and entry=office=living room, respectively. With this situation, the highest integration value is also in the hall/dining room, while the lowest values are in balcony 2 and the kitchen. The spaces with the highest visual connectivity value are the living room, hall/dining room and entrance, while the lowest ones are wc, bathroom and chest room. Visual integration value is highest in the hall/dining room and living room and lowest in the bathroom and bedroom 2. The opposite was seen in the visual mean depth value. Visual entropy was highest in the bathroom, room and living room where visibility was not evenly

distributed. Therefore, in this apartment, the hall/dining room and the guest and living room were the most integrated spaces of the apartment due to their two alternative uses and multiple entrances. In this example, the integration and depth values of the active common areas and the spaces that serve private use yielded the expected results.

Horozluhan Apartment	Justified Graph Output via Agraph			Visibility Graph Analysis Output via Depthmap			
	Total Depth (a.v.)	Mean Depth (a.v.)	Integration (a.v.)	Visual Connectivity (a.v.)	Visual Integration (a.v.)	Visual Mean Depth (a.v.)	Visual Entropy (a.v.)
Entry	29	2,23	4,87	728,94	9,83	1,94	1,32
Office	29	2,23	4,87	667,76	9,87	1,95	1,23
Kitchen	38	2,92	3,12	486,79	8,2	2,12	1,45
Hall/Dining room	21	1,61	9,75	837,59	10,75	1,86	1,26
Living room	29	2,23	4,87	939,18	9,94	1,94	1,52
Hallway	22	1,69	8,66	588,19	8,78	2,07	1,31
Balcony 1	34	2,61	3,71	554,72	9,02	2,05	1,27
Room	30	2,3	4,58	552,64	8,08	2,15	1,54
WC	34	2,61	3,71	147,9	7,44	2,23	1,07
Chest room	34	2,61	3,71	300,06	7,95	2,15	1,19
Bedroom 1	34	2,61	3,71	495,62	8,31	2,11	1,3
Bathroom	34	2,61	3,71	151,48	4,89	2,9	1,57
Bedroom 2	31	2,38	4,33	425,4	6,65	2,4	1,48
Balcony 2	39	3	3	448,61	8,43	2,12	1,24

Table 3. Analysis results of Horozluhan Apartment, a. v.: Average value

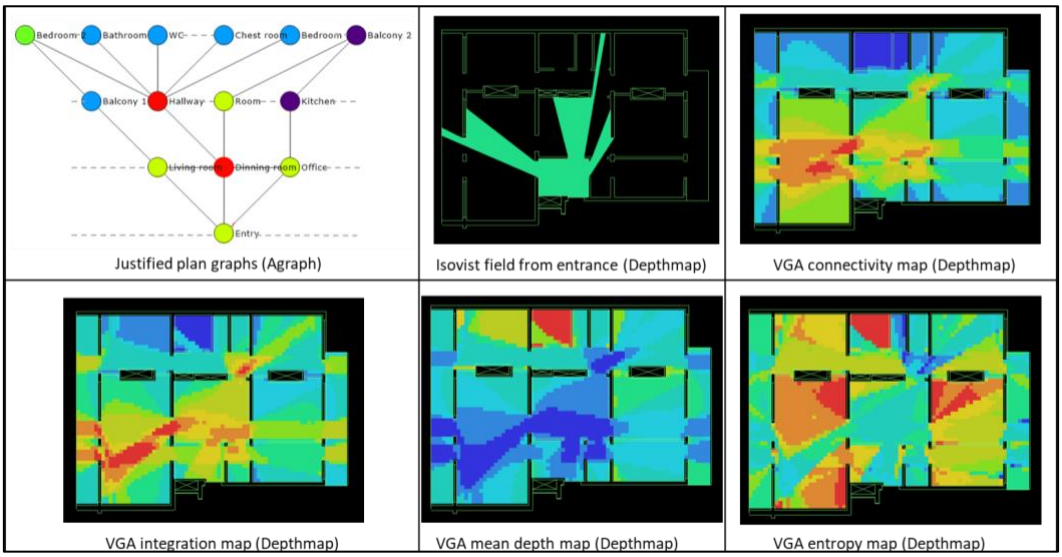

Table 4. Spatial analysis of Horozluhan apartments

In the case of Yeşil Meram Apartment, as seen in Tables 5 and 6, the units with the highest total and mean depth are balconies and bedrooms. The spaces with the shallowest depth are the hallway and entrance. This coincides with the integration value, which is inversely proportional to depth. On the other hand, two different situations were tested in this example for Visual Graph Analysis. In Yeşil Meram Apartment, the analysis results were evaluated for the cases where the room and living room were unified and separated. In the condition where the two spaces are independent, the highest visual connectivity value is in the living room and hallways, while the lowest values are in the kitchen, bathroom and bedroom 1, respectively. In the case where the two spaces are combined, the highest values are in the living room and hallways. The lowest values were in the kitchen, bedroom 1 and bathroom in turn. Looking at the visual integration value for the separated case, hallway 1, hallway 2 and living room had the highest value, while hallway 1 was followed by living room/room in the unified case. Both in the separated and unified cases, bedroom 1 gave the lowest value. When we look at the visual mean depth value for the separated case, the deepest spaces were balcony, bedroom 1, kitchen=bedroom 2 and room respectively; while in the unified case, it was bedroom 1, kitchen, balcony and bedroom 2. The shallowest spaces in the separated case were hallway 1, hallway 2, entrance and living room, while in the unified case, they were living room/room, hallway 1 and hallway 2. In both cases, the spaces with the highest visual entropy were balcony and bedroom 1, while the spaces with the lowest visual entropy were hallway 1 and bathroom. When a general evaluation is made for both cases, unifying the living room and the room has increased spatial integration, decreased the depth value and positively affected the comprehensibility of the apartment. In summary, the circulation areas and the living room are the most integrated spaces, while the bedrooms, kitchen and balcony are the units with the greatest depth.

Yeşil Meram Apartment	Justified Graph Output via Agraph			Visibility Graph Analysis Output via Depthmap							
	Total Depth (a.v.)	Mean Depth (a.v.)	Integration (a.v.)	Visual Connectivity (a.v.)		Visual Integration (a.v.)		Visual Mean Depth (a.v.)		Visual Entropy (a.v.)	
Vestibule	31	2,81	2,75	This space was not included in the analysis because it was outside the entrancedoor.							
Entry	21	1,9	5,5	351,57	351,84	7,26	7,62	2,23	2,16	1,53	1,46
Living room	27	2,45	3,43	623,19	865,74	7,06	10,61	2,26	1,82	1,83	1,53
Hallway	17	1,54	9,16	517,3	597,75	8,75	10,8	2,02	1,83	1,47	1,16
Kitchen	27	2,45	3,43	183,38	183,32	5,63	6,01	2,55	2,47	1,5	1,39
Wc	27	2,45	3,43	327,79	299,05	6,52	7,83	2,32	2,11	1,68	1,27
Bathroom	27	2,45	3,43	217,64	236,48	6,43	7,41	2,36	2,18	1,47	1,24
Room	23	2,09	4,58	337,52	865,74	5,83	10,61	2,47	1,82	1,76	1,53
Hallway 2	23	2,09	4,58	529,31	509,04	7,54	9,23	2,13	1,93	1,75	1,32
Bedroom 1	33	3	2,5	224,13	217,34	4,56	5,19	2,88	2,66	2,06	1,62
Bedroom 2	33	3	2,5	406,25	404,01	5,78	7	2,55	2,32	1,94	1,52
Balcony	37	3,36	2,11	351,69	395,29	4,66	6,52	2,91	2,34	2,08	1,78

Table 5. Analysis results of Yeşil Meram Apartment; a. v.: Average value

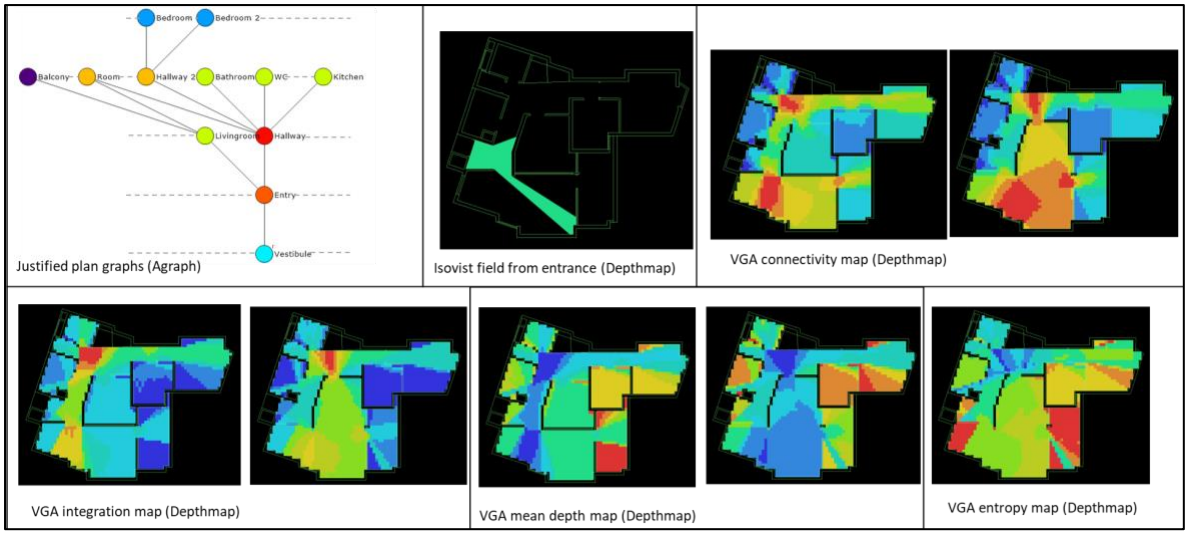

Table 6. Spatial analysis of Yeşil Meram Apartment

5. FINDINGS

When all samples are analyzed based on apartments, as seen in Table 7 and Figure 8, Yonca Apartment, Horozluhan Apartment and Yeşil Meram Apartment for total depth, are replaced by Yeşil Meram Horozluhan in terms of mean depth value. The deepest spaces in the samples were bedrooms, night hallways and bathrooms. The spaces most related to the entrance are the dining room, living room and hallways. When the integration value obtained from graph analysis is analyzed, Horozluhan, Yeşil Meram and Yonca apartments have the highest value respectively. In the visual graph analysis, Horozuhan, Yeşil Meram 2 (unified situation), Yonca, Yeşil Meram 1 (separated situation) were ranked in terms of connectivity value. In the visual integration value, Horozuhan, Yonca, Yeşil Meram 2, Yeşil Meram 1 were found. Although the total depth of the Horozluhan example is higher than the other examples, the fact that the visual connectivity and integration value is higher than the other examples can be explained by the fact that the depth is distributed throughout the entire system and the hall/dining room space in the centre of the apartment contributes to this distribution. In the visual mean depth value, Yeşil Meram 1, Yeşil Meram 2=Horozluhan, Yonca apartments have the highest value. The examples with the highest visual entropy values are Yeşil Meram 1, Yonca, Yeşil Meram 2 and Horozluhan. The gradual access from the centre to the spaces and symmetrical planning in Horozluhan may have been effective in reducing the entropy value and may have reduced the complexity level of the apartment. On the other hand, in the case of dual use in Yeşil Meram, it is seen that the combined use has a positive effect on spatial analysis. Looking at the Isovist area taken 360 degrees from the entrances of the houses, the Yonca apartment has the highest field of view, while the Yeşil Meram apartment building has the lowest field of view. Looking at the examples, it is seen that the spaces that are most included in the field of view other than the entry hall are dining rooms, hallways and living rooms. Bedrooms, night hallways, bathrooms and kitchens were excluded from the field of view. To measure the legibility of all samples, the scatter plot of the connectivity/integration value of the whole system was analyzed. Yonca apartment has the closest result to R=1, followed by Yeşil Meram 2, Horozluhan and Yeşil Meram 1. In this case, the examples with results close to 0.8 are considered legible/intelligible, while the segregated use in Yeşil Meram harmed the value.

Apartment Block Houses	Justified Graph Output via Agraph			Visibility Graph Analysis Output via Depthmap				Isovist Field via Depthmap	Scatter Plot via Depthmap
	Total Depth (a.v.)	Mean Depth (a.v.)	Integration (a.v.)	Visual Connectivity (a.v.)	Visual Integration (a.v.)	Visual Mean Depth (a.v.)	Visual Entropy (a.v.)	Isovist Area from entrance	Connectivity / Integration R^2
Yonca Apartment	23,2	2,57	2,85	469,125	8,66	2,05	1,58	249443	0,81
Horozluhan Apartment	31,28	2,4	4,76	627,269	8,81	2,1	1,39	205011	0,78
Yeşil Meram Apartment 1	27,16	2,46	3,95	419,09	6,34	2,44	1,79	80837	0,51
Yeşil Meram Apartment 2	27,16	2,46	3,95	558,79	8,6	2,1	1,49	86541	0,8

Table 7. Comparative analysis results of selected apartments, a. v.: Average value

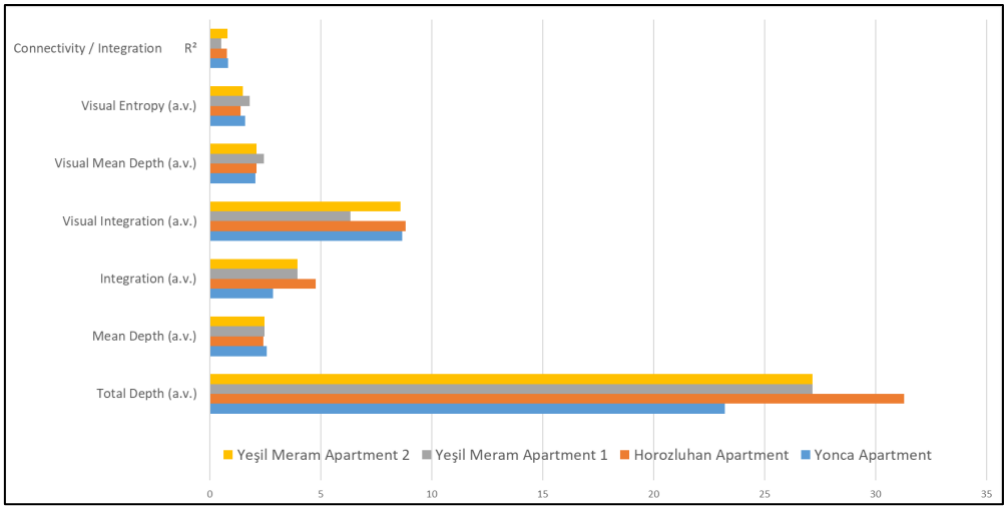

Figure 7. Graphical representation of analysis results

6. CONCLUSION

It is seen that the examples examined within the scope of the research are located in an Anatolian city that grew after the migration from rural to urban areas, in a period of increasing apartmentisation, and were designed by architectural offices in metropolitan cities. These apartment buildings, which are located on corner plots on major streets of the city, have shown different block structuring with the effect of the parcel. While the Yonca apartment building has a single core in the center of the tripartite block, Horozluhan and Yeşil Meram have L-type block structures. In Horozluhan, this block is closed with three cores, whereas Yeşil Meram, as a unique application in the city, has an open circulation and three cores. The main core is formed by the elevator tower in the center and supported by the stair towers at both ends. In this example, open circulation areas serve functions such as sitting, growing flowers, and hanging laundry.

Different applications in block structuring have also brought about differences in apartment solutions. In Yeşil Meram, all spaces are oriented towards a single façade while the kitchen faces the open circulation area, and in Yonca Apartment, the independent sections are located on two façades while the kitchen faces the open light well between the blocks. In the Horozluhan apartment building, on the other hand, there is

an orientation to two opposite facades with balconies throughout and there is access from all independent units. The kitchen opens onto the balcony here.

Although there is an entry area at the entrance in apartment buildings, in Horozluhan and Yonca examples, this area is solved with a garderobe. In all three examples, the entrance has a relationship with the living room or the dining room associated with it. This situation is reflected in the spatial integration, making these spaces, excluding the circulation areas, the most intensely integrated spaces in all examples. Another element that supports this value is the fact that living rooms were designed with two uses guest and daily living rooms (*salon-salomanje*), as seen in the housing understanding of the period. In the Yonca and Yeşil Meram examples, the part of this space near the entrance was designed as a dining room, while in the Horozluhan example, a hall in the centre of the apartment that does not receive light was also furnished as a dining room. This approach, which offers flexible use of the apartment, has been effective in reducing the spatial depth and increasing the integration within the residence. Another noteworthy issue in all three examples is the kitchens. The kitchens are accessed from the entrance through a hallway. This has been effective in increasing the depth of the kitchen and reducing its visibility, thus increasing the degree of privacy of this space. The kitchens are small in square meters and are solely composed of counters, with no space allocated for a dining table. In all examples, the bedrooms are accessed through a night hallway. The hallway also includes a bathroom and storage areas. In addition, in all examples, there are built-in storage closets in the bedrooms or hallways. This is associated with the continuity of the fixed furniture concept of traditional housing. In Yonca and Yeşil Meram apartments, the toilet is located next to the kitchen through a hall close to the entrance, while in Horozluhan it is located in the bedroom corridor. Although the distance from the entrance varies, bedrooms, night hallways, bathrooms, and toilets are the spaces with the most depth in all examples. The gradual distribution of depth from common to private through hallways shows the need for privacy in the transition process from traditional housing culture to modern housing. As a result, even though different architects designed the apartment examples analysed, it has been determined that they contain similar characteristics reflecting the apartment style of the period in Türkiye (dual-use living rooms, closets, small kitchens accessed indirectly from the entrance, and bedrooms accessed last). The fact that these spaces within the apartment yielded similar results in the analyses supported this situation.

Within the limitations of the study, only 3 buildings were analysed. In future studies, the scope of the study can be expanded and the change in social life can be examined by comparing the plan typology with the Konya house since it is the period when the transition from traditional housing to apartmentisation. In addition, the selected buildings belong to nationally reputed architects. By examining the plans of the apartment buildings designed by local architects and not produced by cooperatives, the characteristics of the plan typology specific to the period can be identified and associated with traditional housing.

REFERENCES

Alagöz, M., Semerci, F., & Aydın, D. (2015). Anadolu'da Modernizmin Yerel Açılımları: Konya'da Üç Yapı Üzerinden Örnekleme . *Türk İslam Medeniyeti Akademik Araştırmalar Dergisi, 10*(19), 109 - 124.

Alkan, L. (2015). Türkiye'de Yıllar İçerisinde Değişen Konut Kavramı ve Konut Sorunu. In L. Alkan, & A. Uğurlar (Eds.), *Türkiye'de Konut Sorunu ve Konut Politikaları* (pp. 31-58). Ankara: Kent Araştırmaları Enstitüsü.

Alitajer, S., & Nojoumi, G.M. (2016). Privacy at home: Analysis of behavioral patterns in the spatial configuration of traditional and modern houses in the city of Hamedan based on the notion of space syntax. *Frontiers of Architectural Research*, 5 (3), 341-352.

Arat, Y., & Kaçar, A. (2021). 1950-2000 Yılları Arası Apartmanlarda Barınma Kültürü ve İç Mekânın Dönüşümü: Konya Örneği [Culture of Sheltering in the Apartments and Transformation of Interior Between 1950 and 2000: Case of Konya]. *Türk İslâm Medeniyeti Akademik Araştırmalar Dergisi , 16*(32), 443-474.

Bakır Doğru, H. (2020). Cumhuriyet Dönemi Konut Mimarisinde İdeal Bir Mekân (Okuması) Örneği: Yapı Kooperatifleri. *Uluslararası Sosyal Araştırmalar Dergisi, 13*(71), 359-366.

Dawes, M. J., Ostwald, M. J., & Lee, J. H. (2021). Examining control, centrality and flexibility in Palladio's villa plans using space syntax measurements. *Frontiers of Architectural Research,* 10(3), 467–482.

Guney, Y. I., & Wineman, J. (2008). The Evolving Design of 20th-Century Apartments in Ankara. E*nvironment and Planning B: Planning and Design*, 35(4), 627-646. https://doi.org/10.1068/b3401

Güney, S. (2009). Mortgage Krizi ve Yapı Kooperatifleri. *Elektronik Sosyal Bilimler Dergisi, 8*(30), 167-180.

Hatipoğlu Şahin, B., & Dağ Gürcan, A. (2021). 1923 Yılından Günümüze Apartman Tipi Konutlardaki Yatak Odası Gelişimi: Konya Örneği. *Düzce Üniversitesi Bilim ve Teknoloji Dergisi, 9*(5), 1909 - 1926.

Hillier, B., & Hanson, J. (1984). *The Social Logic of Space*. London: Cambridge University Press.

Hillier, B. (2014). Space Syntax as a Theory as Well as a Method. *21st. International Seminar on Urban Form: ISUF*. Portugal.

ILO. (2022). *Kooperatif İstatistiklerine İlişkin ILO rehberi üzerine bir bilgilendirme kılavuzu.* Kooperatiflerin Ölçülmesi: Retrieved from: https://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---ilo-ankara/documents/publication/wcms_885560.pdf

Keleş, R. (2013). *Kentleşme Politikası (1.baskı).* İstanbul: İmge Kitabevi.

Koç, H. (2022). Kentsel Konut Sunumunda Giderek Unutulan Bir Organizasyon: Konut Yapı Kooperatifleri. *İdealkent, 37*(13), 2002-2026.

Malhis, S. (2017). The Spatial Logic of Mamluk Madrassas: Readings in the Geometric and Genotypical Compositions. *Nexus Network Journal*, 19(1), 45–72. https://doi.org/10.1007/s00004-016-0309-5

Mansouri, A. & Ünlü, A. (2018). A Syntactic Approach to the Effect and the Role of Hayat and Riwaq in the Geometric Conception of Traditional Housing Architecture in Iran: Tabriz Houses. *A+Archdesign*, 4(1), 47-64.

Manum, B. (2009). AGRAPH; Complementary Software for Axial-Line Analysis. I*n Proceedings of the 7th International Space Syntax Symposium,* (pp. 1–9). Sweeden, Stockholm.

Nejadriahi, H. and Dincyurek, O. (2015), Identifying Privacy Concerns on the Formation of Courtyards, *Open House International,* 40(4), 18-24. https://doi.org/10.1108/OHI-04-2015-B0004

Orhun, D., Hillier, B., & Hanson, J. (1995). Spatial Types in Traditional Turkish Houses. *Environment and Planning B: Planning and Design*, 22(4), 475–498.

Pourvahidi, P. (2020). Privacy Cognition of Spaces by Agraph Tools in Temperate Humid Climatic Region of Iran. *ICONARP,* 8(1), 241–261. https://doi.org/10.15320/ICONARP.2020.112

The Turkish Cooperatives Report (2017). Retrieved from: https://ticaret.gov.tr/data/5d41e45e13b87639ac9e02dc/15fb10a7fe0bba07482ac9da277b5d35.pdf

Şalgamcıoğlu, M. E., & Ünlü, A. (2013). Examining Space Transformation in Apartment-based Housing Units in Istanbul Using Space Syntax Parameters. *9th International Space Syntax Symposium*. Seoul, 19.1-19.19.

Şen, E., & Baran, M. (2020). Examination of Traditional Residences in Bitlis on the Zeydan District Scale in the Context of Space Syntax Analysis Techniques. *Sage Open*, 10(2), 1-16.

Şen (b), E. (2021). Horozluhan Apartmanı. In A. Güleç Korumaz, & M. Yarar (Eds.), *Konya'nın 1950 Sonrası Çağdaş Yapıları* (pp. 78-79). İstanbul: YEM Yayın.

Şen, E. (2021). Yonca Apartmanı. In A. Güleç Korumaz, & M. Yarar (Eds.), *Konya'nın 1950 Sonrası Çağdaş Yapıları* (pp. 42-43). İstanbul: YEM Yayın.

Tekeli, İ. (2009). *Konut Sorununu Konut Sunum Biçimleriyle Düşünmek.* İstanbul: Tarih Vakfı Yurt Yayınları.

Turner, A., Doxa, M., O'Sullivan, D., & Penn, A. (2001). From Isovists to Visibility Graphs: A Methodology for the Analysis of Architectural Space. *Environment and Planning B: Planning and Design*, 28(1): 103–121.

Turner, A. (2001). Depthmap: a Program to Perform Visibility Graph Analysis. *3rd International Symposium on Space Syntax*, Georgia Institute of Technology, 7–11 May 2001.

Url-1. (2024). *https://www.youtube.com/watch?v=687y2ZtoPzc*.

Url-2. (2024). *https://arkiv.com.tr/index.php/proje/konya-yesil-meram-yapi-kooperatifi/7985*.

Url-3.(2024).*https://ticaret.gov.tr/kooperatifcilik/bilgi-bankasi/kooperatifler-hakkinda/turkiyede-kooperatifcilik*.

Url-4. (2024). https://arkiv.com.tr/proje/konya-yesil-meram-yapi-kooperatifi/7985

Zabihi, A. and Mirzaei, R. (2023), The evolution of privacy in contemporary houses in Iran using space syntax techniques: a case study of Kerman, *Open House International*, 48(1), 55-80.

FEASIBILITY CRITERIA OF TRADITIONAL PASSIVE CLIMATIZATION SYSTEMS IN CONTEMPORARY BUILDINGS: WIND TOWER CASE STUDY

GÖZDE BALCI, SAVAŞ EKİNCİ

Gözde Balcı, Arch. M.Sc., Mimar Sinan Fine Arts University, **Savaş Ekinci,** Assistant Professor, Mimar Sinan Fine Arts University

ABSTRACT

Humans are living beings who continue their lives in the constructed environment. Ensuring comfort conditions is essential in these structures where humans spend the majority of their lives. Passive or active climatization methods (such as heating, cooling, and ventilation, etc.) are utilized while providing comfort conditions. Moreover, our planet is a living system that encompasses humans and the structures they inhabit. Various needs on Earth are met using renewable or non-renewable energy sources. With the industrial revolution to the present day, industrialization and technological advancements have led to a significant increase in energy consumption, a substantial decrease in non-renewable resources, and environmental pollution reaching levels threatening ecological sustainability. Consequently, policies aimed at reducing energy consumption and environmental pollution have been brought to the forefront. In the world, 40% of energy consumption is in the construction sector, with the majority used in the climatization systems of buildings to provide comfort against environmental conditions. While climatization needs in buildings can be met by expending energy with active systems, they can be sustainably provided through architectural form without using energy with passive systems.

Examples of climate-compatible sustainable methods can be found in Traditional (pre-industrial) architectures. In this context, the question of whether passive systems can also be used in contemporary buildings as an approach to reducing energy consumption is on the agenda. To this end, this study examines wind towers, which are one of the traditional architectural elements used for passive ventilation and cooling in hot climate regions of the Middle East. Firstly, what natural ventilation and cooling are, their necessity, and the methods by which they can be achieved without energy consumption are explained. Then, examples of wind towers in traditional architecture are examined among these passive ventilation methods; comparison tables regarding their different applications are provided. The working principles, dimensional, and architectural features of wind towers are explained. Finally, the adaptability of traditional wind towers' passive climatization approach to contemporary buildings is examined; the design criteria that need to be taken into consideration for applicability on a building-specific basis are discussed.

Keywords: energy, passive ventilation, wind tower (badgir), feasibility

INTRODUCTION

Natural ventilation is one of the most crucial spatial comfort requirements, having been utilized in various structures for different purposes throughout history. Ventilation is essential for providing spatial comfort and ensuring human health. Consequently, the first natural ventilation system was developed in a hospital combating epidemic diseases alongside the 'miasma' theory. In Ancient Greece, 'miasma' referred to bad air, the aura of death, or foul air. Natural ventilation in the hospital was achieved through chimneys on the roof according to the miasma theory, minimizing the likelihood of contagious diseases spreading to other patients within the hospital through respiratory transmission. Moreover, structures from the Neolithic era in China, rice rooms in Japan from a century ago, and traditional houses in Anatolia were naturally ventilated. Energy crises in the 1970s, coupled with the rapid depletion of non-renewable energy sources and the recognition of their adverse environmental impacts, led to environmental awareness and energy conservation becoming significant topics among nations and states. Approximately 40% of the energy consumed worldwide is utilized in the construction industry, with the majority allocated to climatization systems. (HABIBZADEH, 2018)

In contemporary times, the use of natural ventilation systems has been brought to the forefront to reduce the energy expended by conventional climatization systems, and their feasibility is being evaluated. Studies have focused on the potential of natural ventilation methods, which have existed for centuries, to reduce the dependency on mechanical climatization systems.

Natural ventilation operates on the principle of bringing clean outside air into the structure while expelling polluted indoor air to the external environment. To achieve this, knowledge of the environmental characteristics during the design phase of the structure is crucial. Climate conditions, regional construction capabilities, cultural architectural language, and social identity are fundamental in determining the ventilation method to be used in the structure.

This study aims to introduce and outline the advantages and disadvantages of a passive/natural climatization method, the wind tower (badgir), which can be utilized to reduce energy consumption for providing climatic comfort in structures. Furthermore, the study aims to compile design criteria that need to be considered during the assessment of feasibility.

METHODS OF NATURAL VENTILATION AND AN EXAMPLE OF WIND TOWER IN TRADITIONAL ARCHITECTURE

Natural ventilation is defined as the intake of atmospheric air into a structure and the expulsion of used air from the structure without the use of mechanical systems. (ÖZER & DURAK, 2008) Another definition describes natural ventilation as a system created by pressure differences resulting from wind, temperature differences between indoor and outdoor air, through intentionally opened sections. (ÖZTÜRK, YILANCI, & ATALAY, 2005)

Natural ventilation is achieved through the displacement of air due to temperature and pressure differences. Temperature differences between indoor and outdoor environments cause a change in air density, resulting in pressure differences. When the temperature inside is higher than outside, the principle of heated air rising causes warm air to be expelled from the highest point of the structure, while cool air from outside is drawn in through openings at lower levels. When the temperature conditions reverse, so does the air movement. Air movements caused by pressure differences occur as a result of positive pressure on surfaces facing the wind and negative pressure on the back surfaces, leading to air being drawn in through openings on surfaces with positive pressure and expelled through openings on surfaces with negative pressure. Ken Yeang defines the function of natural ventilation as preserving user health, providing thermal comfort, and structural cooling. (DEMİR, 2011)

Proper climate control is crucial for human health in enclosed spaces. In addition to heating and cooling, supplying fresh air to the environment and removing polluted air are necessary. Today, building envelopes

are made airtight due to environmental and energy consciousness, and ventilation is left to mechanical systems. However, ventilation can still be achieved through natural methods, as in traditional structures, to reduce energy consumption and promote sustainability.

Various natural and artificial environmental factors affect natural ventilation. Natural environmental factors include climate, topography, orientation, dominant wind direction, and intensity, while artificial environmental factors include the form of development, dimensions of structures, differences in height, spaces between structures, urban voids, and landscape elements that can affect wind direction and speed. When the distance between structures narrows, wind speeds up in these areas, and the angle at which buildings are oriented affects wind direction. Therefore, the ways in which buildings benefit from wind and their positions relative to each other depend on the climatic characteristics of the area. For example, in cold climate regions, dense settlement patterns that provide both protection from wind and opportunities for natural ventilation are preferred, while in hot and humid climate regions, sparse settlement patterns are preferred for utilizing wind for cooling, drying, and ventilation purposes.

The utilization or controlled utilization of wind by buildings depends on their position within building clusters and their orientation relative to the wind. Wind pressure zones on a building depend on the angle at which the wind interacts with the building. The maximum pressure occurs on surfaces perpendicular to the wind, while the minimum pressure occurs on surfaces angled at 45 degrees to the wind. Therefore, when buildings are designed to benefit from the wind, they should be positioned relative to each other in a way that minimizes wind shadows and avoids shading each other.

The form of a building affects its interaction with the wind and the pressure zones and levels that will form on its surfaces. Factors such as the aspect ratio of the building in plan, its height, roof type and slope, facade inclinations, and wind direction control geometries related to the building influence natural ventilation. These characteristics affect the speed of the air affecting the building, the level of pressure zones formed, and their distribution. Wind hitting tall buildings creates different pressure zones around the building. When wind hits a building, it separates and is directed towards the roof, ground, and side faces, along with incoming air molecules. Thus, the wind hitting the surface accelerates upwards along the facade, creating different pressure zones. Winds towards the ground, after moving along the facade, separate from the building before reaching the ground and create fast whirlwinds in areas close to the surface. They circulate around the building and reach the back of the structure with low pressure. Vertical air currents occur in rectangular planned buildings, while lateral air currents occur in circular or nearly circular planned buildings.

The building envelope consists of elements that separate the indoor and outdoor spaces. For effective natural ventilation in buildings, fresh air must be taken into the building through the envelope, circulated within the space, and polluted air must be expelled from the indoor environment. Windows, doors, towers, and chimney openings in the building envelope are architectural elements that provide ventilation. Fresh air is taken into the environment through these openings, and the temperature and quality of the indoor environment change, while polluted air is expelled through these openings. The number, location, arrangement, and size of the openings used for ventilation are important. Incorrect choices may result in inefficient ventilation. (DARÇIN & BALANLI, 2012)

As important as bringing fresh air into the building is circulating it within the structure for effective ventilation. Units affecting air circulation should be planned accordingly, and sections and equipment that may hinder airflow should be placed inside the space.

Various obstructive or directing elements can be encountered as wind approaches the building. One of these is landscape elements. Wind approaching the building can be obstructed, accelerated, diverted, or filtered for cleaner air by landscape elements.

Passive ventilation occurs in three forms: comfort ventilation, cross ventilation, and chimney ventilation. Chimney ventilation is based on the principle of heated air rising. In regions where there is no wind or in

urban settlements where air movement is not required, a chimney effect is created in one part of the building with rising warm air. In this method, as the warm air rises, it is expelled from the upper opening, while cooler air enters from the lower opening, thus achieving natural ventilation through air circulation.

In regions with dense and low-rise structures, wind may not reach the windows, and natural ventilation may not be provided through openings at these levels. In such cases, wind towers are used to capture and transport upper-level air currents into the building. Wind towers are oriented towards the prevailing wind and provide a continuous airflow. However, since the angle and direction of the wind may vary by month, these towers should be designed to capture wind from multiple directions. (YÜKSEK & ESİN, 2011)

WIND TOWER

A wind tower is a structural element used for ventilation purposes in hot dry and hot humid climate regions. The purpose of a wind tower is to capture the wind and direct it into the building, creating a clean and cool indoor environment while expelling dirty air outside to ensure air circulation. Although it's not possible to limit the regions that use wind towers, the first known examples can be observed in the tents of the Middle East. The ventilation of the tents, made of wood and fabric, was provided by joining wood and fabric with ropes. The creation of small openings on the top of the tents facing the wind to capture the wind serves as an example of this.It is believed that wind towers were first developed in Egypt and the Middle East and then spread to Afghanistan, Iraq, and Iran. The depiction of wind towers on the lines of the tomb of Pharaoh Nebamun around 1300 BC supports this notion.

Since wind towers are singular structural elements located above buildings, they are susceptible to environmental damage and have been primarily affected by natural disasters. Therefore, although there is no clear information about ancient wind towers, some information can be obtained through archaeological studies. A wind tower house discovered by Japanese archaeologists during excavations in Iran revealed that wind tower examples in Iran date back to 4000 BC. (Ahmadkhani Maleki, 2011)

In various regions of the Middle East with different climatic and cultural characteristics, various wind tower typologies have been experimented with and implemented to naturally cool buildings against hot climate conditions. There are many wind towers in Egypt, Iraq, Iran, Afghanistan, and Pakistan serving the same purpose but with different features shaped according to regional conditions. These wind tower typologies formed in the Middle East according to climate and environmental physical and social conditions are compared and compiled in the table below based on their orientations, dimensional features, partition types, service areas, chimney, and roof types.

Country / Wind Region / Tower Characteristics	Iran's Hot Dry Region	The Persian Gulf	Iraq	Egypt	Pakistan	Afghanistan
Climate	Hot Dry	Hot Humid	Hot Dry	Hot Dry	Hot Humid	Semi-Arid
Plan	Rectangular, square, hexagon, octagon	square	rectangular	rectangular	square	square
Height	3-5	3-5	1.80-2.10	One floor height	Over 5m	1.5m above roof
Orientation according to wind	diagonal	diagonal	normal	normal	diagonal	normal
Roof shape	flat	flat	Inclined at 45°	Inclined at 30°	Inclined at 45°	Inclined at 30°
Space ventilated by wind tower	Living area and basement	Living area and other rooms	Basement	Living area and one room	All rooms	All rooms
Chimney type	Multi-directional	Multi-directional	One or two	Single	Single	Single
Chimney image						

Table 1. Typologies of Middle Eastern Wind Towers (Compiled from Habibzadeh, 2018 Source)

IRANIAN WIND TOWER (BADGIR)

Within the scope of this study, the wind towers used in the Middle East, particularly the application in Iran known as Badgirs, have been examined. Discussions have been held regarding the evaluation criteria that should be taken into account for their implementation in contemporary construction and building processes.

The use of wind towers for natural ventilation purposes is quite common in the central and southern parts of Iran, becoming an integral part of the region's architectural identity. As a structural element, it also influences the appearance of buildings due to its dimensions. Plan and facade differences vary according to the decisions of designers, contributing to diversity. Iranian wind towers exhibit a wide variety of plans and directions, such as rectangular, hexagonal, and octagonal, single-directional, double-directional, four-directional, and six-directional. These features are created to maximize the benefit from the wind according to the wind characteristics of the location. For example, in the city of Yazd, located away from the desert

and between two mountains, wind towers are tall and multi-directional due to the fast and varied wind directions. In the city of Meybod near the desert, wind speed is low and dusty due to the desert, so wind towers in Meybod are tall and single-directional to catch suitable wind. In the south of Iran, wind towers are four-directional, wide, and low according to the existing weather conditions. In Iran, wind towers generally have flat roofs as there is no problem of rainfall. When wind tower sizes and design aesthetics are examined, they reflect the socio-economic status of the owner. Wind towers operate in two ways due to pressure and temperature differences. Positive pressure occurs in the direction where the wind hits the tower, and negative pressure occurs on the opposite side. Air is taken into the interior space from the chimney opening in the direction of positive pressure, and the heated air inside rises and is expelled outside from the chimney outlet on the side of low pressure. Thus, air circulation is completed. Traditional wind towers are divided into smaller openings vertically with adobe or wooden walls in the plan plane. These sections extend from the base to the ceiling of the wind tower. The channels have different plan types and narrow down to increase wind speed. Additionally, the partitions contribute to the durability of the element.

Figure 1. Sections of the Wind Tower (Farahza & Khajehrezaei, 2011)

The materials used in traditional wind towers are dependent on the climate and the local material potential of the area. Wind towers, commonly used in hot climate regions, are typically made of earth materials. In hot and dry areas, wind towers constructed from fired bricks are utilized, while in hot and humid regions, they are coated with plasters called 'gach' and 'sarooj' to protect against moisture. Due to the earth-based construction, adobe has the ability to absorb heat, and the inclusion of straw particles and the material's color prevent harmful rays from entering the structure by absorbing sunlight.

The height of a wind tower is determined by the level of clean and cool air in the area. In hot and dry regions, where sunlight is reflected from the ground, resulting in elevated temperatures at lower levels, the height of the tower is increased. Conversely, in hot and humid regions, where cooler air currents are present near the ground, tall wind towers are not necessary. Being somewhat elevated from the roof is sufficient. Research indicates that 60% of wind towers are shorter than 3 meters, with 15% reaching heights of up to 5 meters (Ahmadkhani Maleki, 2011). The chimney plan is generally square or rectangular.

Wind towers are divided into sections at the top, each facilitating airflow in specific dominant wind directions, comprising one, two, four, six, or eight sections. Single-directional wind towers are used in areas where airflow is predominantly from one direction. Their roofs are angled to better capture and direct the wind. For example, single-directional wind towers are positioned towards the sea to capture sea breezes on the coast of the Basra Gulf. Due to their simpler structure and lower cost, single-directional wind towers are applied separately to each room in dry climate regions. Double-directional wind towers are divided into two shafts by adobe walls. Their entry and exit openings are oriented towards the wind, making them more functional than single-directional ones. Quadruple-directional wind towers are the most commonly used type, with all of them being used in hot and humid regions and over half in hot and dry regions. In quadruple-directional wind towers, the tower is divided into four shafts opening in four directions. While the variety of height and exit depends on the wind characteristics of the area, they are generally larger and taller.

DISCUSSING THE APPLICABILITY CRITERIA OF TRADITIONAL VENTILATION METHODS THROUGH WIND TOWER APPLICATIONS

Ventilation is a prerequisite for user comfort and human health in any structure. Various active and passive systems are used in buildings to maintain indoor air quality under suitable conditions for these purposes. Wind towers are a building element used for ventilation in hot, dry, and hot, humid climate regions. Due to their long-standing use in combating the climate of the Middle East, they have become one of the region's architectural elements. Today, ventilation is mostly provided through mechanical systems, which consume energy during material production, transportation, installation, as well as during usage and maintenance processes. In response to depleting energy resources and increasing environmental pollution issues globally, the building sector has begun to consider energy-free passive heating, cooling, and ventilation solutions. Examining and understanding passive ventilation methods successfully used in traditional architecture and evaluating their applicability in modern times is necessary and feasible for these solutions to be given modern interpretations.

Considering today's construction processes, the use of wind towers should be evaluated within the framework of various design criteria in terms of relationships. The application of wind towers incurs additional costs to the structure; however, due to being made of local, accessible, and sustainable materials in traditional architecture, these costs are low in terms of construction and maintenance. Since it is resolved within the building area as a plan, there is no need for additional space. Due to being a singular vertical element, wind towers have often been damaged by natural disasters in traditional examples, and their lifespan is generally shorter than that of the structure. With today's construction techniques and materials, it is possible to equalize the element's lifespan with that of the structure. While there is energy consumption and embodied energy throughout the production and transportation processes of materials used in wind tower manufacturing, its function as an energy-free passive climate control system throughout its usage period results in a positive relationship between wind towers and energy consumption. Traditionally, wind towers have been used mainly for ventilating eyvans in single-story structures. Looking at contemporary building forms, multi-story apartment blocks and single-story structures with multiple units per floor are prevalent. In such cases, architectural design decisions such as a single tower serving all floors or multiple towers for different sections become necessary. A wind tower is a system that captures fresh air flow and directs it into the interior while expelling stale air from the interior, and buildings in urban settlements should be positioned in such a way as not to shade each other from the wind. Due to the dense and tall construction prevalent in today's urban fabric, detailed studies should be conducted to determine to what extent wind towers applied to buildings in these areas can utilize dominant wind and airflow patterns on the settlement area. As it does not provide extra usable space due to its vertical nature, its usage alongside a water element circulates clean air from the outside into the interior and, in addition, provides coolness by using water. The form of wind towers is shaped according to the climatic characteristics of the region and the necessity of utilizing wind. If a decision has been made for the necessity of a wind tower, its form should be determined according to the climate. The dimensions and decorations of wind towers in traditional Middle Eastern architecture provide information about the socio-economic status of the building owner and have led to the formation of an architectural style in these cities. In modern applications, it should be kept in mind that the tower is a visible building element, and its effects on the built environment, silhouette, and appearance of the building should be evaluated.

A wind tower is one of the passive ventilation methods. When a passive ventilation solution is implemented in a building, all its features such as cost, usage possibilities, limitations, and aesthetic effects should be considered in comparison with other passive ventilation methods. For example, when designing a single-story structure with a small footprint, its ventilation can be achieved through cross-ventilation by opening windows at different levels. In this case, it should be assessed whether there are environmental elements that may obstruct airflow to the windows. It should be noted that landscape elements, settlement density,

and the heights of surrounding buildings are important factors to consider for detecting small-scale airflow changes.

Climate characteristics are one of the main elements in building design. When designing climate-compatible structures, analyses should be conducted at the city, neighborhood, and building scales, and solutions should be developed based on the performance (benefit/harm situation) of the solutions to be used. Wind chimneys are used in different shapes in different regions nowadays. In this section, modern wind chimney examples will be introduced, and a table evaluating their applicability criteria will be created.

Lighthouse Zero Energy, United Kingdom

As part of a strategic plan enacted in the UK in 2016 to reduce energy consumption, the 'Lighthouse Zero Energy' project was designed with the aim of zero energy usage and environmental sustainability. This project features a wind tower with a traditional working principle. It is the UK's first net-zero carbon home, aiming to respond to climate change while minimally interfering with our lifestyle. Placed above the staircase void, the tower delivers clean air to all floors and rooms. It is designed to capture wind from all directions and utilizes the temperature difference between day and night to facilitate air circulation within the structure. Cool air from the outside, cooler than the indoor air, descends through the chimney, removing stagnant indoor air and enhancing the chimney effect. Due to sufficient humidity levels, no humidification solution is implemented inside the tower.

Figure 2. Visualization of Lighthouse Zero Energy (Habibzadeh, 2018)

Jalal-abad Villa, Iran, 2018

Constructed in the rural area of Isfahan in 2018, Jalal-abad Villa aimed to blend traditional and modern methods to introduce a new construction model. The structure incorporates different structural and cladding materials cohesively, utilizing low-cost local materials such as bricks and certain local construction techniques. A wind tower, commonly used in traditional Iranian architecture for passive cooling purposes, has been integrated into the building, aligning the traditional method with contemporary construction. Additionally, the wind tower has provided the necessary elevation for a water tank, which is positioned atop the tower. (URL-1, URL-2)

Figure 3. Visual of Villa Jalal-Abad

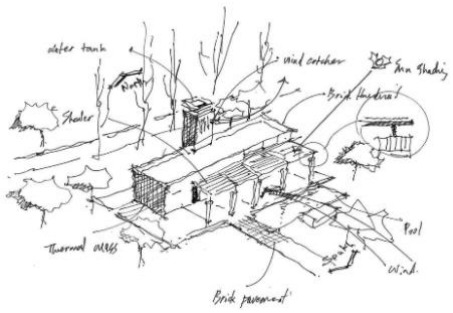

Figure 4. Sketch Drawing of Villa Jalal-Abad

QATAR UNIVERSITY, QATAR, 1985

In 1985, wind towers referencing traditional wind catchers were utilized at Doha University. These towers operate individually for each space. Positioned in the dominant wind direction and gradually constructed so as not to obstruct each other's airflow, the towers are divided into two parts to prevent mixing of hot and cold air currents. Cold air enters through the openings of the tower and descends into the space, while hot air rises and exits through smaller openings on the opposite side of the tower. Thanks to this inexpensive and passive system, the air inside the space remains cool throughout the day. Additionally, the towers transmit sunlight into the interior spaces and gardens, fulfilling the need for natural light. (URL-3)

Figure 5. Visual of Qatar University

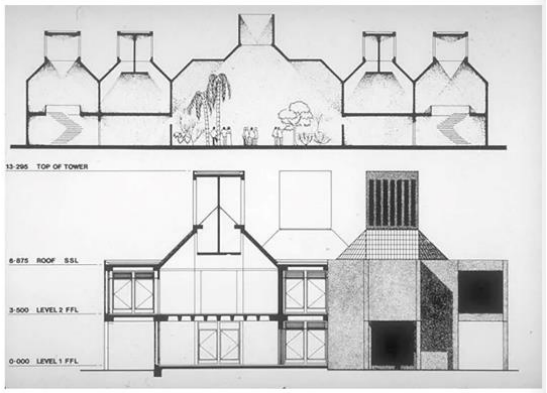

Figure 6. Chimney Drawing of Qatar University

Windcatcher House, Indonesia, 2008

Constructed in East Surabaya in 2008, this house diverges from the local architectural identity of the settlement area by adopting a modern design. The house is oriented towards the east, the prevailing wind direction. The three-dimensional facade at the front serves as a wind catcher, keeping the house cool without the need for air conditioning. The layout of the plan is also designed to facilitate the circulation of this captured air within the interior space. (URL-4, URL-5)

Figure 7. Visual of Windcatcher House

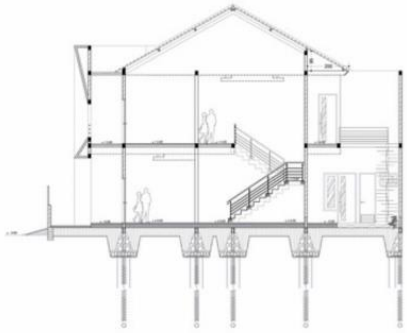

Figure 8. Section of Windcatcher House

TORRENT UNIVERSITY RESEARCH CENTER, INDIA, 1999

Wind towers are proven and effective elements used in passive ventilation, but their usage has declined over time. However, in recent years, they have begun to be used in modern buildings with renewed functions and forms. In these examples, it is possible to see the wind tower not as an addition to the building but as an integral part of the design. Wind towers have been used in an integrated manner into the design, particularly in certain areas of university campuses. The Torrent University Research Center is the first example of large-scale functional wind towers.

Figure 9. Visual of Torrent University Research Center

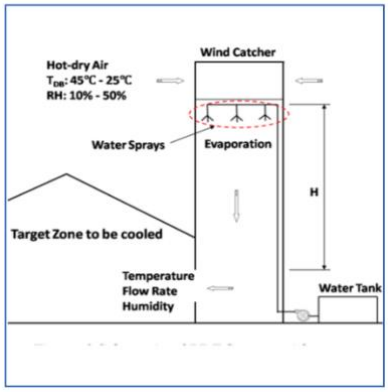

Figure 10. Passive Downdraft Evaporative Cooling

In order to significantly reduce energy consumption, a wind tower is utilized in conjunction with the Passive Downdraft Evaporative Cooling (PDEC) system. The design of the building ensures airflow even under stagnant air conditions. The air heats up in the towers located on the outer perimeter, rises, and is expelled through openings at the upper level. Meanwhile, fresh air is drawn in through the tower above the hall, completing the air circulation. The incoming air is cooled within the tower by water sprays, which also increase its density, facilitating its descent. Cool air is drawn into the interior through windows located at each floor level. Conversely, warm air within the space is transferred to the towers on the outer perimeter through high-level windows. During cold weather, airflow is controlled by opening and closing these windows. Users can adjust airflow within their spaces according to their comfort needs through these windows. This system has significantly reduced carbon monoxide emissions and saved costs by eliminating the need for a 200 metric ton air conditioning system. (URL-6)

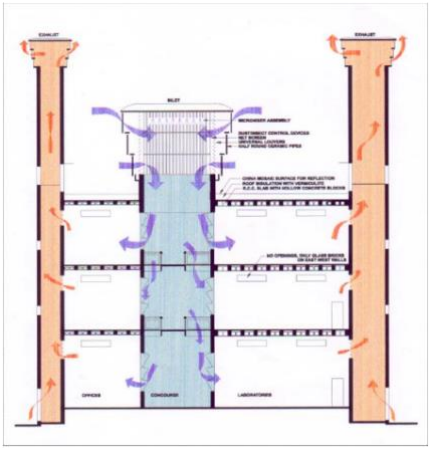

Figure 11. Section of the tower at Torrent University Research Center

Figure 12.Tower Plan of Torrent University Research Center

OUTDOOR WIND TOWER, ABU DHABI

Wind towers are commonly used for enclosed and semi-enclosed spaces, but there have been experiments regarding their use in open areas as well. A group of researchers based in Madrid, Spain, supported by the European Council, has conducted a project on evaporative wind towers that could be used in outdoor spaces such as boulevards in hot, dry summer climates. They installed 16 wind chimneys in a circular plane and collected data, noting that the chimneys lowered temperatures by up to 3.5°C in some areas. However, it was observed that thermal comfort could only be provided up to a height of +1 meter from the ground. This indicated an efficiency of 32% for the system.

In Masdar City, Abu Dhabi, the streets are designed to be wide and flat. Streets are obstructed and narrowed due to cantilevers, undulating facades, and photovoltaic panels fixed to roofs. These designs create useful shaded areas for pedestrians on the streets. To harness and direct the wind, a wind tower has been installed in the public space. This installed wind tower serves as an example of using wind towers in outdoor environments. Equipped with adjustable louvers according to different wind directions, the tower aims to cool the area by up to 5°C. Water jets at the top of the tower spray a fine mist, humidifying and cooling the air. Although there is no available data on research results, it has been reported that residents of the area feel thermally comfortable for four months of the year. (Abbas, Hyowon, & UooSang, 2016)

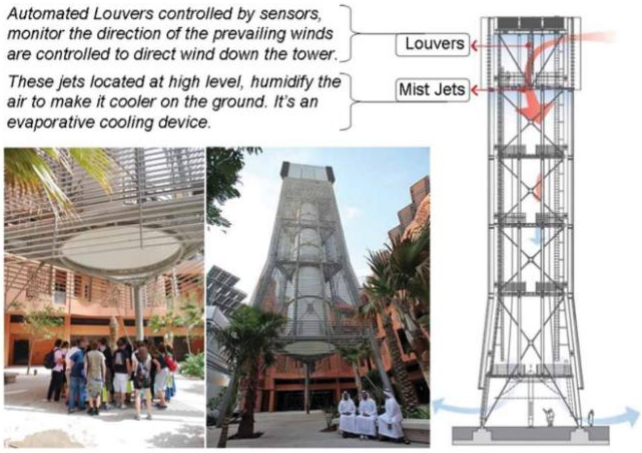

Figure 13. The Windcatcher in Masdar City Involves Complex Technology to Control the Orientation of the Wind and Quality of the Air (ABBAS, HYOWON, & UOOSANG, 2016)

Barjeel Installation, Dubai, 2019

Inspired by the architectural wind towers of Dubai, the Barjeel installation, created in 2019, embodies an architectural ensemble. Cool air captured by the wind tower is conveyed to the seating area below. Wind towers, dating back to ancient times, have not only been used as passive ventilation and cooling systems but have also evolved into architectural identities and urban symbols over time. This installation is a result of the desire to establish a sustainable connection with one's living space. Through geometric abstraction and the use of reusable materials, the Barjeel installation attempts to reflect the spatial characteristics of the local typology from which it derives its name. (URL-7)

Figure 14. Visual of the Barjeel Installation

Example / Criteria	Lighthouse Zero Energy, United Kingdom	Jalal-abad Villa, Iran	Qatar University, Qatar	Windcatcher House, Indonesia	Torrent University Research Center, India	Outdoor Wind Tower, Abu Dhabi	Barjeel Installation, Dubai
Construction Cost	Low	Low	High	None	High	High	Low
Maintenance (Operating) Cost	Low	Low	Medium	None	Medium	Medium	Low
Construction Cost Recovery Period	Short	Short	Short	Short	Short	-	-
Lifespan Compared to Building	Equal	Equal	Equal	Equal	Equal	Equal	Equal
Determining Effect on Building Character	None	None	Exists	None	Exists	-	-
Usability for Different Functions	No	Yes	Yes	Yes	No	No	No
Impact on Building Footprint	None	None	None	None	Increased	-	-
Impact on Building Volume	Low	Low	High	-	High	-	-
Embedded Energy Quantity	Low	Low	Medium	Low	High	Low	Low

Impact on Energy Consumption	Reducing	Reducing	Reducing	Reducing	Reducing	Reducing	Reducing
Effect on Spatial Composition	None	None	Present	None	Present	-	-
Adaptation to Climate and Geography	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
Efficiency / Necessity Status	Efficient	Efficient	Efficient	Efficient	Efficient	Efficient	-
Solution to Space Humidity	None	None	None	None	Present	Present	None

Table 2. Evaluation Table of Tower Examples in terms of Applicability Criteria

CONCLUSIONS

As seen in Table 2, in the example of Qatar University, the towers designed for ventilation were also utilized as natural lighting lanterns, thus serving a dual function. Similarly, in the case of the Jalal-abad villa in Iran, the roof of the tower provided the necessary height for the water tank. The embedded energy amount is related to the type of material used, and the scale/intensity of use of the structural element. As observed in the example of Torrent University Research Center, the intensity of use is so high that it becomes a decisive factor in the form of the structure, hence resulting in a higher embedded energy amount. Conversely, in the case of the Jalal-abad villa in Iran, the embedded energy amount of the wind tower, used as a singular element proportional to the scale of the structure, is lower due to the use of local materials. In low-rise or single-story buildings, the wind tower used on the roof does not increase the footprint area of the building, whereas in high-rise buildings, wind towers designed to serve all floors, as in the example of Torrent University Research Center, increase the building's footprint area. In the case of the Windcatcher House, designed as a facade ventilation element, it provided energy savings without causing additional costs or space loss. Wind towers are passive ventilation systems and, being implemented with accessible materials and simple methods, they have low maintenance costs and significant effects on reducing energy consumption.

In conclusion, in today's world where depleted resources and energy crises are on the agenda, it is imperative to use passive systems to reduce energy consumption in buildings. When selecting passive systems to be used in buildings, the climatic characteristics of the location should be taken into account, and designs should be made accordingly. In traditional architecture, in hot, arid climate regions, the density of construction is high to protect against solar radiation. This dense construction also obstructs the flow of wind into spaces. Wind towers were used to capture cool air currents at upper levels and convey them to lower-level spaces. These towers, being singular elements located higher than the structure, have often not reached the present day in traditional architecture due to reasons such as earthquakes. The working principles, dimensional, and functional characteristics of wind towers, which are one of the passive ventilation methods, have been introduced, and examples of their contemporary use have been shared. As seen in the examples, passive ventilation is an effective method in providing comfort conditions in a cost-effective and simple way. Based on these examples, criteria to be considered for the implementation of wind towers today have been discussed. When implementing wind towers, the climatic characteristics of the location should be known, and ventilation needs should be determined. Subsequently, factors such as cost, function, benefit/loss, and sustainability should be evaluated to implement wind towers in a way that adds optimum value to the design.

REFERENCES

Abbas, M., Hyowon, L., & UooSang, Y. (2016). From Medieval Cairo to Modern Masdar City: Lessons learned through a comparative study. Architectural Science Review, 59(1), 39-52.

Ahmadkhani Maleki, B. (2011). Wind Catchers: Passive and Low Energy Cooling System in Iranian Vernacular Architecture. International Journal on Technical and Physical Problems on Engineering, 3(3), 130-137.

Bahadori, M. (1985). An Improved Design of Wind Towers for Natural Ventilation and Passive Cooling. Solar Energy, 35(2), 30-41.

Boloorchi, H., & Eghtesadi, N. (2014). Investigation of the Middle East Windcatchers and (Comparison between in Catchers in Iran and Egypt in Terms of Components). International Journal of Architecture and Urban Development, 4(1), 87-94.

DARÇIN, P., & BALANLI, A. (2012). Yapılarda Doğal Havalandırmanın Sağlanmasına Yönelik İlkeler. Tesisat Mühendisliği, 128, 33-42.

DEMİR, N. (2011). Yüksek Yapılar ve Sürdürülebilir Enerji. Yüksek Lisans Tezi. İstanbul: YTÜ.

Farahza, N., & Khajehrezaei, İ. (2011). Badgir (Rüzgar Kulesi), Earthen Resistant Structure. 2011 International Conference on Earthen Architecture in Asia.

HABIBZADEH, A. (2018). Konut Yapılarında Doğal Havalandırmanın Önemi ve Badgir Bağlamında Günümüz Koşullarında Değerlendirilmesi. İstanbul: Yüksek Lisans Tezi.

LINDA, M. (2007). Design in Hot Arid Climate: A Case of North Horr Town, Kenya. Nairobi: The University of Nairobi.

ÖZDENİZ, M. (1979). Yapma Çevre Tasarımında Rüzgar Etkeni. Çevre ve Mimarlık Bilimleri Derneği, 163-182.

ÖZER, S., & DURAK, M. (2008). Rüzgar Enerjisi: Teori ve Uygulama. Ankara: İmpress Matbaası.

ÖZTÜRK, H., YILANCI, A., & ATALAY, Ö. (2005). Enerji Etkin Pasif İklimlendirme: Doğal Havalandırma. Tesisat Mühendisliği Dergisi, 89, 21-26.

WALKER, A. (2010). Natural Ventilation Principles.

YÜKSEK, İ., & ESİN, T. (2011). Yapılarda Enerji Etkinliği Bağlamında Doğal Havalandırma Yöntemlerinin Önemi. 10. Ulusal Tesisat Mühendisliği Kongresi. İzmir.

URL-1 : https://www.archdaily.com/960898/jalal-abad-villa-haj-sabz

URL-2 : https://www.archidiaries.com/projects/jalal-abad-villa-hajm-e-sabz/

URL-3 : https://hiddenarchitecture.net/qatar-university/

URL-4 : https://www.archdaily.com/91656/ira-residence-andy-rahman/5013113c28ba0d0658000e9a-ira- residence-andy-rahman-section?next_project=no

URL-5 : https://archello.com/project/windcatcher-house

URL-6 : https://www.archidev.org/spip.php?article1115&lang=fr

URL-7 : https://www.archdaily.com/928454/barjeel-installation-miskavi-architecture-studio

AN EVALUATION ON THE RELATIONSHIP BETWEEN ARCHITECTURE AND NEUROSCIENCE

MELİSA DİKER

Melisa Diker, Assistant Professor, Department of Architecture, Faculty of Architecture, Iskenderun Technical University.

ABSTRACT

The impact of neuroscience, a branch of science that focuses on the structure of the brain and examines the nervous system, on architecture, the art of designing and creating the built environment, is a highly relevant topic today. A comprehensive understanding of the structure and functioning principles of the human brain holds significant importance for designers and users alike in the context of space or environment design. The objective of this research is to investigate the relationship between neuroscience and architecture and to evaluate the knowledge and contribution that neuroscience can provide to architecture, particularly through recent relevant scientific studies. A literature review will be conducted on the topics of 'neuroscience and architecture' and 'neuro-architecture'. In conclusion, the aims, methods, and findings of these studies examining the relationship between architecture and neuroscience will be evaluated through comparison.

INTRODUCTION

While human beings transform the environment or structure they live in in line with their own needs and desires, the environment or structure they live in also changes and transforms human beings. Typically, the living environment is closely linked to the identity of users. Moreover, when introducing themselves, people often talk not only about their own qualities, but also about the historical, cultural and even physical aspects of their environment.

Users may exhibit diverse responses to varied cues that they perceive through their sensory organs when navigating the constructed environment or an architectural spaces. A person may feel good, happy and excited in some places and bad, unhappy, calm or stressed in others. Or, when an individual falls ill, the illness may end because the space or environment in which he or she will be present has "various features". Understanding the design parameters that enhance productivity in businesses or facilitate attentive listening in educational settings is beneficial for both the designer and the users of the space. At this point, when designing the space or the environment; knowing neuroscience, which examines the structure and working style of the human brain, is very important for designers in terms of providing inputs for design. In terms of users, this situation can help to ensure the correct management of emotional reactions and behaviors such as good, bad, etc. shown in the environment/space. This study aims to explain the contributions that neuroscience can offer to the field of architecture. In this context, a literature review is conducted within the scope of examining the article studies, especially those produced in recent years, that address the relationship between "neuroscience and architecture" and "neuro-architecture". This approach aims to comprehend the present condition of neuro-architecture and unveil significant concepts associated with the field. The research focused on analyzing publications specifically linked to neuro-architecture, while excluding books, book chapters, reports, and theses from the study. As a result, the point that neuro-architecture has reached today is understood by comparing the articles analyzed in terms of purpose, method and findings.

NEURO-ARCHITECTURE

Based on the interaction of the built environment and the neural activities of the brain, neuro-architecture is a new field that brings together neuroscience, environmental psychology and architecture (Karakaş ve Yıldız, 2019). Bringing together the disciplines of architecture and neuroscience to better understand the relationship between the human brain and the built environment, this field will help to move towards a future of architecture and design that prioritises human health and well-being (Azzazy vd., 2021). Neuroarchitecture investigates the impact of designed spaces on the human brain and explores how knowledge of the brain's response might inform future architectural enhancements (Doughert &Arbib, 2013). In other words, neuro-architecture examines the relationship between sensory experience in the built environment and architectural perception (Papale at al., 2016).

In a 2003 issue of the Society for Neuroscience, the term 'Neuroscience' was first mentioned in relation to building design in an interview with Eberhard and Gage explaining why architects and neuroscientists started to work together (Azzazy vd., 2021). In the same issue, the announcement of the establishment of the first academic research organisation focusing on neuro-architecture (the Academy of Neuroscience for Architecture (ANFA)) was also included (Eberhard ve Gage 2003; Arellano 2015; Azzazy vd., 2021). Established in 2003 in San Diego, ANFA is acknowledged as a research institute that promotes and enhances the application of neuroscience research to better understand of how humans interact with the built environment (ANFA, 2003).

Neuro-architecture focuses on the shape and plasticity of objects, and architects have been progressively using neuro-architecture to ensure that form serves human functions and produce pleasure (Karakaş ve Yıldız, 2019).

Karakaş and Yıldız (2019) categorize the methodologies and strategies to examine the connection between neuroscience and the built environment into three groups: environment and behaviour research techniques, neuroscience research techniques, and digital tools. In environmental and behavioural research techniques; observational measurement, self-report measurement, archival data and mapping techniques such as mental, behavioural, cognitive, bio-mapping, bio-sensory are used. Psycho-physiological measurement techniques are used in neuroscience research techniquesPsycho-physiological measurements include neuroimaging techniques (fMRI, PETI EEG, ERP, MEG), heart rate, blood pressure, electrodermal activity, pupil response, blood volume, blinking, eye movements, skin conductance and skin temperature. Digital tools include crowdsourcing using social media tools, wearable devices, GPS technologies that combine emotional responses with locations, mobile camera systems and virtual reality (VR) glasses (Karakaş ve Yıldız, 2019).

According to Azzazy et al., psychological analyses are mostly used in the literature to investigate the impact of the built environment on mental health. There is a scarcity of scientific research that utilize neuroimaging techniques, such as brain scans, for the purpose of investigating neuroarchitecture (Azzazy vd., 2021). In recent years, however, advances in medical equipment, especially in radiology and brain mapping, have allowed researchers to study the impact on the nervous system more and more (Azzazy vd., 2021; Nanda ve ark. 2013; Papale ve ark. 2016).

Previous studies on the connection between neuroscience and the built environment have primarily explored environmental psychology. However, since the 1990s, there has been a shift towards focusing on psychology and engaging in critical discussions that view the environment as a secondary factor in human psychology (Karataş, 2019; Gieseking, 2014). In the articles analysed within the scope of this study; it can be said that topics such as "healing environments, place-orientation experiences, the effect of form on emotions, methodologies and techniques, aesthetic evaluation, limitations and contributions in the field" come to the fore.

Considering the intersection of neuroscience and architecture, "healing environments, spaces" draw attention. The healing feature of nature can be an important factor in the design of spaces. Understanding the design characteristics that promote healing in buildings, particularly those with health-related purposes, can provide guidance to architectural designers. In a study conducted by Ulrich in 1984, it was found that patients whose postoperative room windows had a park view had better results compared to patients whose room windows had a brick wall view. In the study; patients whose windows overlooked the park complained less to the nurses, needed lower strength painkillers and were discharged earlier than patients whose windows overlooked the brick wall. (Ulrich, 1984). In another study conducted by Ulrich et al. in 1991, participants first watched a stressful film and then videos from six different natural and urban environments. Meanwhile, physiological measurements (heart rate, muscle tension, skin conductance and pulse transit time, blood pressure) and emotional verbal measurements were made. The results showed that recovery was faster and more complete when the participants were in natural rather than urban environments. Participants who stayed in the natural environment reported higher levels of attention and positive changes in physiological activity levels (Ulrich at al. 1991). Martínez-Soto et al. examined the neural response to restorative environments to investigate stress restoration. For this, while participants looked at photographs with low or high restorative potential, connections in the brain were investigated with functional magnetic resonance imaging (FMRI). The results showed that attention increased in high restorative photographs and suggested that vegetation could be integrated into the building to improve stress restoration (Martinez-Soto at al.2013). Similar to these studies, Van den Berg et al. investigated the viewing of nature and the built environment by using different sized photographs with different levels of complexity. While being shown the photographs, the participants were asked to rate the concepts of "complexity, beauty, fascination, relaxation, positive effect". It was concluded that participants responded positively to natural scenes and fractal patterns more commonly found in nature

(Van den Berg at al., 2016). Stigsdotter vd. (2017), Blood pressure, heart rate variability and psychological and mood changes were measured in both walking and sitting participants in urban and natural environments. The results showed that there was no difference between the two environments in terms of heart rate, but psychologically, walking in the natural environment is good for the mood and has a restorative feature. (Stigsdotter at al. 2017).

In a study (Higuera-Trujillo et al., 2020), the effect of environmental sources of satisfaction on stress reduction was analyzed in a waiting room for patient companions in a pediatric ward, which is different from a natural or urban environment. A multisensory simulation was performed through a virtual reality experiment with visual, auditory and olfactory elements and stress levels were recorded both at the psychological and neurophysiological levels. The results suggest that a combination of environmental sources of satisfaction can be said to produce a significant synergistic effect at the psychological and neurophysiological levels. The study shows that it underlines the importance of auditory and olfactory stimuli (Higuera-Trujillo at al., 2020). Similar to the healing effect of natural and urban environments, Asim et al. (2023) investigate the role of the built environment on campus in influencing the mental recovery and well-being perception of students under constant stress and psychological distress. After determining the activity points on the campus with a survey, the role of built environment elements on restorative approach/neglect behavior and perception of the built environment was investigated. EEG (Electroencephalography) data were recorded with mobile bands worn on the participants' heads. A neuropsychological study including the Perceived Restorativeness Scale (PRS) was conducted. The results suggest that some environmental elements such as vegetation, novelty/uncertainty, acoustic environment and expansive views may be associated with positive approach behaviors and others such as high building density may be associated with avoidance behaviors (Asim at al., 2023). Azzazy et al. reviewed literature studies investigating the impact of the built environment on the mental state of the user. As a result, brain activities that are complex and meditative in a natural environment showed higher levels of stress when in a built environment (Azzazy at al, 2020).

Wayfinding in the built environment is an important cognitive activity, and organizing the built environment in a way that facilitates wayfinding is important for the city to be imaginable and readable. On wayfinding, Karandinou et al. (2017) tried to understand the brain's response to physical environments. The brain activity of participants walking around the city was recorded with a portable EEG device, while the route was also video recorded. The result examined how moments of decision-making in the journey and variation in the physical qualities of the built environment are associated with specific brain waves (Karandinou at al., 2017). Passini et al.'s study aimed to identify design principles that would promote and facilitate wayfinding for people with Alzheimer's disease. For this study, interviews were conducted with the staff of an urban care home and wayfinding experiences were conducted with residents. The results suggest that it is important to include environmental information in wayfinding, and that the monotony of the architectural composition and the lack of reference points make wayfinding difficult (Passini at al. 2000). Djebbara et al. used a mobile brain/body imaging approach to investigate cognitive processes associated with architectural affordances, recording brain activity synchronized with head-mounted displays. Participants perceived and acted upon virtual transitions ranging from impassable to easily traversable. The results showed that the mechanisms that enable meaningful movements in the environment originate in the motor system. It can be said that the potential to move in a certain environment originates from environmental possibilities and affects perception (Djebbara at al, 2019).

There are also some studies examining whether having expertise and experience in architecture causes changes in brain activity when making aesthetic judgments in the built environment. Kirk et al. (2009) used functional magnetic resonance imaging (fMRI) to examine aesthetic judgments of visually presented architectural stimuli and control stimuli (faces) for a group of architects and non-architects. This study tested whether level of expertise modulates neural activity in brain regions associated with perceptual processing, memory or reward processing. The results showed that even in the absence of behavioral

aesthetic rating differences between architects and non-architects, there were changes in areas of the brain involved in perceptual processing, memory and reward processing during aesthetic judgment (Kirk at al., 2009). It can be said that some parameters such as upbringing, culture, expectations are important along with architectural experience when making aesthetic evaluation in architecture. Xie et al. considered that people may have different aesthetic cognitions regarding their sensory characteristics on the architectural design of hotels. By conducting a field research and interviews, they stated that sensory-motor, information-meaning and emotion evaluation systems play a key role in appreciating architectural aesthetics. They also stated that familiarity, expectations, context and cultural background directly influence an individual's aesthetic knowledge and the meaning of architecture (Xie at al., 2022). Coburn at al states that architectural experiences are the target of neuroscientific research and recent developments in neuroaesthetics with a literature review. It is asserted that emotional reactions can serve as the basis of architectural experiences and that these experiences can be influenced by education, upbringing, and personal experiences (Coburn at al, 2017).

The geometry and shape of architectural space or building parts have an impact on aesthetic judgments and emotional responses. Vartanian et al. conducted a functional magnetic resonance imaging study to examine how systematic variation in contour affects aesthetic judgments and approach-avoidance decisions. Participants were shown images with curvilinear and linear contours, including open-closed (windows) and low-high ceilings. Then participants were asked whether they found these images beautiful and whether they would enter these spaces. In conclusion, participants found the curvilinear contours more beautiful than the linear ones, but this did not affect their approach-avoidance decisions. bunun yaklaşma-kaçınma kararlarını etkilemediği belirtilmiştir (Vartanian at al, 2013). In a similar study, Banaei et al. stated that curved forms in the interior space were evaluated more positively in relation to the emotional state of the participants. In the study, a mobile brain/body imaging approach was used to record the electroencephalogram (EEG) of participants walking through different indoor forms in virtual reality (VR) while perceiving the spaces (Banaei at al., 2017). In another study by Nanda et al., which examines the effect of forms and contours of the image through a literature review, it is stated that curvature in architectural forms can change the quality of the response compared to sharp lines. And it is stated that this may affect the emotional experience of individuals. The study also pointed out that the common unit between designing architectural environments and functional magnetic resonance imaging (fMRI) experiments is the 'visual image' (Nanda at al., 2013). Naghibi Rad et al. investigated the effect of window shapes on the emotional state and cortical activity of perceivers. Psychophysical experiments and electroencephalogram (EEG) were used for this study. As a result, rectangular, square, circular and semicircular arched window shapes were identified as pleasant, while triangular and triangular arched window shapes were identified as unpleasant window shapes (Naghibi Rad at al., 2019).

It can be said that the presence or absence of window openings in the architectural space affects the stress level and increases the feeling of leaving the space. In their study, Fich et al. measured salivary cortisol and heart rate variability in participants who entered a virtual room, a closed room without windows and a room with windows. As a result, participants in the closed room responded to the triggering of stress with more pronounced and higher cortisol reactivity. So the design of architectural space can influence the stress response (Fich at al. 2014). Similarly, Vartanian et al. measured using fMRI that closed-window areas can elicit an emotional response accompanying exit decisions due to a reduction in visual and locomotive permeability (Vartanian at al, 2015).

It is also very important that architectural spaces serve their intended use and meet the needs expected from the building. Paiva's work discusses the latest findings in neuroscience that can be useful for architecture by reviewing the literature. Paiva stated that schools can be improved to enable learning, workspaces can be improved to enhance performance, and hospital buildings can be improved to enable healing (Paiva, 2018). In another study, Mehta and Zhu (2009) investigated on the psychological impact of color. They found that the color of the surroundings has an influence on cognitive task performance.

Specifically, they observed that red color enhances performance on tasks that require attention to detail, whereas blue color enhances performance on activities that require creativity. This effect of color can be considered an important element, especially in spaces that require attention and concentration.

There are some studies that review the existing literature on neuro-architecture, describing the potentials, challenges and developing techniques. In their study, Higuera-Trujillo et al. map the work done in this field, focusing on the impact of architectural design on people's cognitive and emotional states. The study critically discusses the limitations, controversies, benefits, impact on relevant professional sectors, and potential of neuroarchitecture and its precursors' approaches (Higuera-Trujillo at al., 2021). Pektaş examined the main research themes and developments in spatial cognition research over the last two decades through the literatüre. Through various analyses, it is stated that spatial cognition in architectural design and the possibilities it provides will guide further studies (Pektaş, 2021).

Similarly, Ghamari et al. (2021) present a bibliometric analysis of the studies on neuroarchitecture in the last three decades and present a general picture of this field. As a result of the study, it is stated that neuroarchitecture has started to grow especially since 2016 and there has been a shift in methodological approaches towards concepts such as EEG, fMRI and virtual reality. Papale at al. highlighted some similarities and differences between the concepts of tactility and metamodality from different perspectives of cognitive neuroscience through a literature review (Papale at al., 2016). Assem et al. examined the literature with a qualitative approach and presented design elements such as form, width, height, light, texture and planting in the context of their physiological, psychological, cognitive and behavioral effects (Assem at al., 2023). Recognizing the intersection of architecture and neuroscience, Eberhard studied the relationship between brain structure and design with the help of literature in order to produce useful designs for people in the future (Eberhard, 2009). Tektaş has made an assessment of existing studies in the literature to understand the relationship between neuroscience and architecture and how neuroscience can help reinterpret architectural history. This study paves the way for research on the correlation between neuroscience, architecture, and architectural history. It emphasizes the necessity of creating an educational and discussion-oriented environment for conducting such investigations (Tektaş, 2023).

Some methods used in the field of neuroarchitecture have been criticized for their limitations and different methods and techniques have been proposed. Wang at al summarized the main goals of neuro-architecture and provided an overview of experimental research in this field. In addition, the Mobile Brain/Body Imaging method was introduced as the current brain imaging techniques are limited to aesthetics and the participants need to be stationary. This is an emerging approach that has the potential to improve the ecological validity of neuro-architectural research (Wang at al., 2022). In his study, Mostafavi systematically reviewed the existing literature using empirical methodology. The reviewed articles categorized architectural design evaluation, experimental VEs (visual environments) and biometric feedback, and the lack of architecturally oriented discussions and theories in experiments was recognized. There is also a need for a comprehensive protocol for reporting the psychological comfort parameters of the experimental environment (Mostafavi, 2022). Karakaş and Yıldız, who systematically reviewed the existing literature, stated that the concepts developed in theoretical frameworks have not yet been validated in experimental studies due to the difficulties of measuring and testing data (Karakaş ve Yıldız, 2020).

The studies examined in this review provide instances of how the aesthetics, form, and design of architect ural structures and the built environment can influence mental and physiological well-being. There are many studies in the literature that measure physiological and psychological responses. According to Coburn et al., the growing interest in the intersection of neuroscience and architecture inspires the design of spaces from a biological perspective. This interest motivates the construction of spaces/environments that contribute to the development of people in terms of behavior, health and well-being (Coburn at al, 2017).

CONCLUSION

This study examined some of the studies in the literature investigating the relationship between neuroscience and architecture in terms of purpose, methodology and findings. The topics of the articles examined within the scope of this study can be summarized as "design features of healing spaces/environments, the experience of orientation in the built environment, the influence of expertise and culture on aesthetic judgments, the influence of spatial form on aesthetic perception and emotional responses, the role of space openings on stress levels, designing spaces for their intended use" (Table 1). In addition, in the articles examining the literature on this field, "the potentials, limitations, and especially the difficulties experienced in experimental methods of neuro-architecture" were expressed.

Especially in the studies conducted through literature review, the contributions of neuroscience to architecture, explanations about neuro-architecture and the methods and techniques used in this field research are mentioned. While the challenges and potentials of this methodology are expressed, it is summarized that there is a shift towards more experimental research in neuroarchitecture research today.

In the experimental articles analyzed in this study, psycho-physiological measurement techniques (fMRI, EEG, heart rate, etc.), wearable digital tools (VR, etc.) were mostly used, while questionnaires were also used to verbally measure the emotional reactions of the participants. In the experimental articles analyzed, the emotional reactions evoked by the built environment, architectural space or form in the individual were tried to be explained by neural connections and changes in the body and brain.

As a result, it can be said that there are some design criteria that affect people emotionally and physiologically in the design of the built environment and architectural space. Designing window openings in health buildings in a way to know the healing power of the natural environment, realizing that curvilinear contours are perceived more pleasant by individuals are just a few of them. Considering that spaces are specifically created for their users, there is a necessity for additional and comprehensive research into the correlation between neuroscience, built environment, and architecture. It is suggested that the designed spaces should be integrated into the architectural design process in a way to include the psychological and physiological feedback of the users (especially with the help of developing technology) and provide a preliminary input to the designers.

Topic	Reference	Method	Results
The Influence of Aesthetic Judgments	Kirk at al, 2009	-Aesthetic Rating, Functional Magnetic Resonance Imaging (FMRI)	Even if there were no differences in behavioral aesthetic ratings between experts and non-experts, it was found that visual and architectural stimuli were handled differently in aesthetic evaluation according to expertise.
	Coburn at al, 2017	-Literature Review	It has been stated that emotional reactions can form the basis of architectural experience and that this experience can change with education, upbringing and personal experiences.
	Xie at al., 2022	-Field work, Interviews	It is demonstrated that familiarity, expectations, context and cultural background directly influence an individual's aesthetic knowledge and the meaning of architecture.
Geometric Forms Affect Aesthetic Judgments and Emotional Reactions	Vartaniana at al., 2013	-Survey, Functional Magnetic Resonance Imaging (FMRI)	Curvilinear spaces were rated as more beautiful. In contrast, although curvilinear spaces activated the visual cortex, they did not affect contour approach-avoidance decisions.
	Nanda at al, 2013	-Literature Review	In the field of neuroscience, it has been noted that the formal elements of a designed visual environment can generate good or bad emotional responses.
	Banaei at al, 2017	-Virtual reality (VR), Electroencephalogram (EEG) ,Mobile brain/body imaging	Curvilinear spaces were found to be more favorable and it was revealed that curvilinear geometries activate some regions of the brain. A new light has been shed on the use of mobile EEG and VR in architectural studies.
	Rad at al., 2019	-Psychophysics experiments, Electroencephalogram (EEG)	Rectangular, square, circular and semicircular arched window shapes were identified as pleasant window shapes, while triangular and triangular arched window shapes were identified as unpleasant window shapes.
Window Openings affect	Vartanian, 2015	-Functional Magnetic Resonance Imaging (FMRI)	Rooms with high ceilings and open spaces were rated as more beautiful. Closed spaces can elicit an emotional response that accompanies exit decisions.

	Fich at al., 2014	-Salivary Cortisol Variability, Heart rate variability (HRV)	Participants in the closed room responded to the triggering of stress with more pronounced and higher cortisol reactivity.
Healing environments/spaces	Ulrich, 1984	-Participants' movements were recorded and observed.	Patients with windows overlooking the park complained less to staff, required lower strength pain medication, and were discharged earlier.
	Ulrich, 1991	-Physiological measurements (heart period, muscle tension, skin conductance, ect.), Emotional verbal measures	It was observed that recovery was faster and more complete in natural environments rather than urban environments. It was stated that attention was higher and physiological activity levels were positive in the natural environment.
	Van der Berg at al., 2016	-Viewing photographs and rating them	There were positive reactions to natural scenes and fractal patterns more commonly found in nature. Nature scenes were viewed for longer periods of time.
	Stigsdotter at al, 2017	-Physiological Measurements (Blood pressure (BP), Heart rate variability (HRV)), Psychological Measures	Heart rate variability results show no significant difference between the two environments. The results of psychological measures show that forest walking has a positive effect on mood.
	Martı´nez-Soto at al., 2013	-Functional Magnetic Resonance Imaging (FMRI)	It was noted that the perception of restorative qualities and a vegetation integrated into the building could be considered for architects to provide the necessary cognitive resources for human functioning.
	Higuera-Trujillo at al., 2020	-Virtual reality experiment -Psychological research -Neurophysiological research	A combination of environmental sources of satisfaction has been reported to produce a significant synergistic effect at the psychological and neurophysiological levels, emphasizing the importance of auditory and olfactory stimuli.
	Asim at al, 2023	-Survey, Electroencephalography (EEG), Perceived Restorativeness Scale	Vegetation, novelty/uncertainty, acoustic environment and wide views are positive approach behaviors and high building density is avoidance behavior.
	Azzazy at al, 2020	-Literature Review	The human brain has shown higher levels of stress in a built environment.
Wayfinding	Karandinou at al., 2017	-Electroencephalogram (EEG), Video record	It was observed that the frequencies in some parts of the brain increased when encountering people on the way while making a pathfinding decision.
	Passini at al., 2000	-Interviews (Staff), Navigation experience (Patient)	Monotony of architectural composition and lack of reference points make wayfinding difficult. Visual access to main destinations increases their use and facilitates wayfinding.
	Djebbara at al., 2019	-Functional Magnetic Resonance Imaging (FMRI)	Early sensory brain activity was found to differ before moving in the environment. It was stated that potential actions provided by the environment affect perception.
Purpose of Use	Paiva, 2018	-Literature Review	Social relationships, focus, cognition, creativity, memory and well-being can all be affected by the surrounding physical space.
	Mehta ve Zhu, 2009	- Photo show, survey	It is stated that the color red increases performance for detail-oriented cognitive tasks, while the color blue increases performance on a creative task.
Review of Existing Literature	Tektaş, 2023	-Literature Review	The evaluation opens the door to studies on the relationship between neuroscience, architecture and architectural history.
	Ghamari at al., 2021	-Literature Review and various analyzes	A shift in neuroarchitecture towards concepts such as EEG, fMRI and virtual reality has been noted.
	Papale at al., 2016	-Literature Review	Relationship between architecture and tactility are mentioned.
	Assem at al, 2023	-A Systematic Review - Literature Review	Neuro-architectural design elements (form, color, width, etc.) are presented in the context of the physiological, psychological, cognitive and behavioral effects of architecture.
	Eberhard, 2009	-Literature Review	It was emphasized that the relationship between architecture and neuroscience can be useful in future designs.
	Pektaş, 2021	-Literature Review - various analyzes	It is concluded that the spatial cognition of architectural design provides a robust framework to guide further studies.
	Wang at al, 2022	-Literature Review	Mobile Brain/Body Imaging is introduced as an approach that has the potential to improve the ecological validity of neuro-architectural research.
	Mostafavi, 2022	-Systematic Literature Review	The lack of architecturally oriented discussions and theories in the experiments. The psychological comfort parameters of the experimental environment need to be reported.
	Karakaş & Yildiz, 2020	-Systematic Qualitative Review-Literature Review	Many concepts developed in theoretical frameworks have not yet been validated in experimental studies. The difficulties of experimental studies in quantifying data are noted.
	Higuera-Trujillo at al., 2021	-Literature Review	The paper critically examines the limitations, controversies, benefits, impact and potential of neuro-architectural approaches

Table 1. Topics, methods, findings in the field of neuro-architecture within the scope of the studies examined.

REFERENCES

Karakas, T., and Yildiz, D., 2020. "Exploring the influence of the built environment on human experience through a neuroscience approach: a systematic review", Front. Archit. Res. 9:236–247. doi: 10.1016/j.foar.2019.10.005

Dougherty, B. O., and M. A. Arbib. 2013. "The Evolution of Neuroscience for Architecture: Introducing the Special Issue." Intelligent Buildings International 5 (sup1): 4–9. doi:10.1080/17508975.2013.818763.

Papale, P., L. Chiesi, A. C. Rampinini, P. Pietrini, and E. Ricciardi., 2016. "When Neuroscience'Touches' Architecture: From Hapticity to a Supramodal Functioning of the Human Brain." Frontiers in Psychology 7: 866. doi:10.3389/fpsyg.2016.00866.

Azzazy, S., Ghaffarianhoseini, A., GhaffarianHoseini, A., Naismith, N., and Doborjeh, Z., 2021. "A critical review on the impact of built environment on users' measured brain activity." Archit. Sci. Rev. 64, 319–335. doi: 10.1080/00038628.2020.1749980

Eberhard, J. P., and Gage, F. H., 2003. "An architect and a neuroscientist discuss how neuroscience can influence architectural design", Neurosci. Q. 6–7.

Ruiz-Arellano, M., 2015. "Hawaiian Healing Center: A Weaving of Neuro- Architecture and Cultural Practices"., Honolulu HI: University of Hawaii at Manoa.

ANFA. 2003. History of ANFA. Accessed 08.05.2024, https://anfarch.org/about/history

Gieseking, J.J., 2014. "Environmental psychology, overview. In:Encyclopedia of Critical Psychology". Springer New York, New York, NY, pp. 587-593.

Ulrich, R. 1984. "View Through a Window May Influence Recovery." Science 224 (4647): 224–225

Ulrich, R. S., R. F. Simons, B. D. Losito, E. Fiorito, M. A. Miles, and M. Zelson. 1991. "Stress Recovery During Exposure to Natural and Urban Environments." Journal of Environmental Psychology 11 (3): 201–230.

Martínez-Soto, J., Gonzales-Santos, L., Pasaye, E., and Barrios, F. A., 2013. "Exploration of neural correlates of restorative environment exposure through functional magnetic resonance". Intell. Build. Int. 5, 10–28. doi: 10.1080/17508975.2013.807765

Van den Berg, A. E., Y. Joye, and S. L. Koole. 2016. "Why Viewing Nature is More Fascinating and Restorative Than Viewing Buildings: A Closer Look at Perceived Complexity", Urban Forestry & Urban Greening 20: 397–401. doi:10.1016/j.ufug.2016.10.011.

Stigsdotter, U. K., S. S.Corazon, U. Sidenius, J. Kristiansen, and P. Grahn. 2017."It is Not All Bad for the Grey City – A Crossover Study on Physiological and Psychological Restoration in a Forest and an Urban Environment", Health & Place 46: 145–154. doi:10.1016/j.healthplace.2017.05.007.

Higuera-Trujillo, J.L., Millán, C.L., Aviñó, A.M.I., & Rojas, J.C., 2020. "Multisensory stress reduction: a neuro-architecture study of paediatric waiting rooms", Building Research & Information, 48:3, 269-285, DOI: 10.1080/09613218.2019.1612228

Asim F., Chani, P.S., Shree, V., Rai, S., 2023. "Restoring the mind: A neuropsychological investigation of university campus built environment aspects for student well-being", Building and Environment 244, https://doi.org/10.1016/j.buildenv.2023.110810

Azzazy, S., Ghaffarianhoseini, A., GhaffarianHoseini, A., Naismith, N., and Doborjeh, Z., 2021. "A critical review on the impact of built environment on users' measured brain activity". Archit. Sci. Rev. 64, 319–335. doi: 10.1080/00038628.2020.1749980

Karandinou, A., and Turner, l., 2017. "Architecture and neuroscience; what can the EEG recording of brain activity reveal about a walk through everyday spaces?", International Journal of Parallel, Emergent and Distributed Systems, 32:sup1, S54-S65, Doi: 10.1080/17445760.2017.1390089

Passini, R., Pigot, H., Rainville, C., & Tétreault, M. H., 2000. “Wayfinding in a nursing home for advanced dementia of the Alzheimer’s type”, Environment and Behavior, 32, 684–710.

Djebbaraa, Z., Fich, L.B., Petrini, L., Gramann, K., 2019. “Sensorimotor brain dynamics reflect architectural affordances” PNAS | July 16, 2019 | vol. 116 | no. 29 | 14769–14778, www.pnas.org/cgi/doi/10.1073/pnas.1900648116

Kirk, U., Skov, M., Christensen, M. S., and Nygaard, N., 2009. “Brain correlates of aesthetic expertise: a parametric fMRI study”, Brain Cogn. 69, 306–315. doi: 10.1016/j.bandc.2008.08.004

Xie H, Chen Q, Nespoli C., and Riso T., 2022. “Understanding the Cognitive Immersion of Hospitality Architecture in Culture and Nature: Cultural Psychology and Neuroscience Views”. Front. Psychol. 13:833819. doi: 10.3389/fpsyg.2022.833819

Coburn, A., Vartanian, O., Chatterjee, A., 2017. “Buildings, Beauty, and the Brain: A Neuroscience of Architectural Experience” Journal of Cognitive Neuroscience 29:9, pp. 1521–1531, doi:10.1162/jocn_a_01146

Vartanian, O., Navarrete, G., Chatterjee, A., Fich, L. B., Leder, H., Modroño, C., et al., 2013. “Impact of contour on aesthetic judgments and approachavoidance decisions in architecture”, Proc. Natl. Acad. Sci. U.S.A 110(Suppl. 2), 10446–10453. doi: 10.1073/pnas.1301227110

Banaei, M., Hatami, J., Yazdanfar, A., and Gramann, K., 2017.“Walking Through Architectural Spaces: The Impact of Interior Forms on Human Brain Dynamics.” Frontiers in Human Neuroscience 11: 477. doi:10.3389/fnhum. 2017.00477.

Nanda, U., Pati, D., Ghamari, H., & Bajema, R., 2013. “Lessons from neuroscience: form follows function, emotions follow form”, Intelligent Buildings International, Vol. 5, No. S1, 61–78, doi: 10.1080/17508975.2013.807767

Naghibi Rad, P., Shahroudi, A. A., Shabani, H., Ajami, S., and Lashgari, R., 2019. “Encoding pleasant and unpleasant expression of the architectural window shapes: an erp study”, Front.Behav. Neurosci. 13:186. doi: 10.3389/fnbeh.2019. 00186

Fich, L. B., Jönsson, P., Kirkegaard, P. H., Wallergård, M., Garde, A. H., and Hansen, Å., 2014. “Can architectural design alter the physiological reaction to psychosocial stress? a virtual TSST experiment”, Physiol. Behav. 135, 91–97. doi: 10.1016/j.physbeh.2014.05.034

Vartanian, O., Navarrete, G., Chatterjee, A., Fich, L. B., Gonzalez-Mora, J. L., Leder, H., et al., 2015. “Architectural design and the brain: effects of ceiling height and perceived enclosure on beauty judgments and approachavoidance decisions”, J. Environ. Psychol. 41, 10–18. doi: 10.1016/j.jenvp.2014.11. 006

Paiva, A., 2018. “Neuroscience for Architecture: How Building Design Can Influence Behaviors and Performance”. Journal of Civil Engineering and Architecture 12, 132-138, doi: 10.17265/1934-7359/2018.02.007

Mehta, R., & Zhu, R. J., 2009. “Blue or red? Exploring the effect of color on cognitive task performances”, Science, 323, 1226–1229.

Higuera-Trujillo, J. L., Llinares, C., and Macagno, E. 2021. “The cognitiveemotional design and study of architectural space: a scoping review of neuroarchitecture and its precursor approaches”, Sensors 21: 2193. doi: 10.3390/ s21062193

Taşlı Pektaş, Ş., 2021. “A scientometric analysis and review of spatial cognition studies within the framework of neuroscience and architecture”, Architectural Science Review, 64:4, 374-382, doi: 10.1080/00038628.2021.1910480

Ghamari, H., Golshany, N., Naghibi Rad, P., Behzadi, F., 2021. “Neuroarchitecture Assessment: An Overview and Bibliometric Analysis”, Eur. J. Investig. Health Psychol. Educ. 11, 1362–1387. https:// doi.org/10.3390/ejihpe11040099

Papale, P., L. Chiesi, A. C. Rampinini, P. Pietrini, and E. Ricciardi. 2016. “When Neuroscience‘Touches’ Architecture: From Hapticity to a Supramodal Functioning of the Human Brain.” Frontiers in Psychology 7: 866. doi:10.3389/fpsyg.2016.00866.

Assem, H. M., Khodeir, L.M., Fathy, F., 2023. “Designing for human wellbeing: The integration of neuroarchitecture in design – A systematic review”, Ain Shams Engineering Journal 14, 102102, https://doi.org/10.1016/j.asej.2022.102102

Eberhard, J.P., 2009. “Applying Neuroscience to Architecture”, Neuron 62, June 25, 753-756, doi: 10.1016/j.neuron.2009.06.001

Tektas, E., 2023. “Mimarlık İçin Nörobilim: Nörobilim ve Mimarlık │Tarihi │Arasındaki İlişki Üzerine Genel Bir Değerlendirme”, Tasarım Kuram; 140. Yıl Sayısı: 138–158. doi: 10.14744/tasarimkuram.416/ ARAŞTIRMA (TEZ)

Wang S, Sanches de Oliveira G, Djebbara Z and Gramann K 2022. “The Embodiment of Architectural Experience: A Methodological Perspective on Neuro Architecture”, Front. Hum. Neurosci. 16:833528. doi: 10.3389/fnhum.2022.833528

Mostafavi, A., 2022. “Architecture, biometrics, and virtual environments triangulation: a research review, Architectural Science Review”, 65:6, 504-521, doi: 10.1080/00038628.2021.2008300

Coburn, A., Vartanian, O., Chatterjee, A., 2017. “Buildings, Beauty, and the Brain: A Neuroscience of Architectural Experience’’, Journal of Cognitive Neuroscience 29:9, pp. 1521–1531 doi:10.1162/jocn_a_01146

WASTES VALORISATION AND REUSE FOR APPLICATIONS IN CONSTRUCTION. A REVIEW OF THE TECHNICAL REGULATION IN EUROPE

ADRIANA CALÀ, MANFREDI SAELI

Department of Architecture, University of Palermo, Viale delle Scienze Bld. 8-14, 90128, Palermo, Italy

* corresponding author: Manfredi Saeli (manfredi.saeli@unipa.it)

ABSTRACT

Among the initiatives for global sustainability, such as the European Green Deal and the 2030 Agenda for Sustainable Development, waste management emerges as a prominent issue. Europe faces significant annual waste generation whose impact on the environment and human health requires more sustainable practices of production and consumption. Therefore, sustainable waste management is a crucial priority in the environmental scenario globally. The waste legislation evolution in Europe resulted in several directives and laws, aimed at promoting waste reduction, recycling and reuse, with the ultimate goal of achieving "zero waste" and complete transition to a real circular economy. That proposes an approach in which materials are exploited and reused as much efficiently as possible, minimising waste spread and environmental impact. In this perspective, the construction sector could give its strong contribution in waste reuse by including residues in building and construction materials and components.

This review discussed the European legislation on waste classification and management, with a focus on the opportunities and benefits of reusing wastes in the construction context, in accordance with the Minimum Environmental Criteria, the circular economy objectives, and the industrial symbiosis. More particularly, the potential and benefits of some types of waste reuse in construction are analysed, such as organic, plastic, or industrial wastes in general. Those find various applications in construction, such as thermal insulation, panels, cladding, plasters, structures, and others. This approach not only could reduce the volume of landfilled wastes, but also offer an opportunity to exploit resources that are commonly considered unusable. This practice is part of a larger context of environmental sustainability and the promotion of a greener future, representing an effective solution to sustainable waste management, also offering several economic, environmental, and social benefits. In fact, it could contribute to the transformation to a more efficient, resilient, and environmentally friendly sector, driving innovation and the search for environmentally sustainable solutions for the built environment.

Keywords: Waste management, wastes reuse, waste directives, circular economy, industrial symbiosis

INTRODUCTION

The implementation of sustainability worldwide is a key concept for the permanence of our planet and its future development. It is a paradigm that focuses on environmental protection, social equity, and economic prosperity, seeking a balance between the needs of today and those of future generations (United Nations, 2024). In this context, Circular Economy (CE) emerges as an alternative economic model to the traditional linear one of "produce-consume-dispose" (World Commission on Environment and Development, 1987). CE aims to dematerialise the industrial processes of production, optimise the use of resources, and regenerate natural systems through the continuous generation of a waste stream that might enter the productive chain as secondary raw resource. That would minimise waste and maximise the value of materials throughout the entire life cycle of a product, from its initial design and manufacture to its final disposal (MacArthur E., 2012). Indeed, one of the main sustainability issues is waste management.

In the past, the environment was considered an infinite resource for raw materials and a place for waste disposal. However, over time, it was realised that its unlimited exploitation would have negative consequences on human and environmental well-being. This led to the adoption of environmental strategies and policies aimed at reducing exploitation and promoting sustainable resource management. Nowadays, waste is seen as a valuable resource to be reused, rather than mere waste to be discarded (Agovino et al., 2023; Chioatto & Sospiro, 2023).

Therefore, it is essential to explore novel opportunities to meet human needs for materials and energy, and to prevent uncontrolled depletion of natural resources. An effective waste management system could offer the opportunity to generate secondary materials and energy without harming ecosystem integrity (Sondh et al., 2024). The maintenance of safe and protected ecological environments, along with the promotion of sustainability and improvement of the economy, required an innovative approach to waste management, particularly by-products from production processes. In this context, several studies have identified various potential strategies for the management of the produced waste worldwide. These include the extraction of organic wastes to be reused in agriculture, the improvement of landfill stability for reciclyng, and the implementation of plans and technologies for the transformation of wastes into reusable resources (Ferronato & Torretta, 2019).

Nowadays, the globally improved living standards require a careful reconsideration of the environmental challenges in all the sectors, including construction. In this context, the reuse of waste by-products as alternative construction and building materials emerges as a promising area of research and potential application. This approach could offer solutions that are not only cost-effective but also environmentally friendly and sustainable for both the construction sector and the waste management in general. Having that in mind, this paper will provide an overview of the European legislation on waste, including classification and management, with a focus on the opportunities and benefits of reusing wastes in the construction context. Different types of wastes and the most recent and innovative uses will be analysed, as well as a variety of cases of study, wiht a focus on waste reuse intended for the manufacture of innovative and green construction materials.

WASTES GENERATION AS A GLOBAL ISSUE: CLASSIFICATION AND QUANTITY

The problem of waste is a global challenge of increasing importance and the excessive production of waste, especially the non-recyclable ones, poses a serious threat to the environment, causing pollution, land consumption, and public health concerns. Looking to the future, global wastes is expected to reach 3.40 billion tonnes by 2050, more than double the population growth over the same period (World Bank, 2024). In fact, the wastes generation is growing worldwide due to an increasing urbanisation and industrialisation. The composition of waste varies considerably from region to region. Generally speaking, in the developing countries the percentage of organic waste is higher; while in the developed countries the percentage of packaging and plastics is more considerable. As a general trend, the predominant fraction is organic and derives from frood and green fractions, as shown in figure 1 (World Bank, 2024; Sondh et al., 2024).

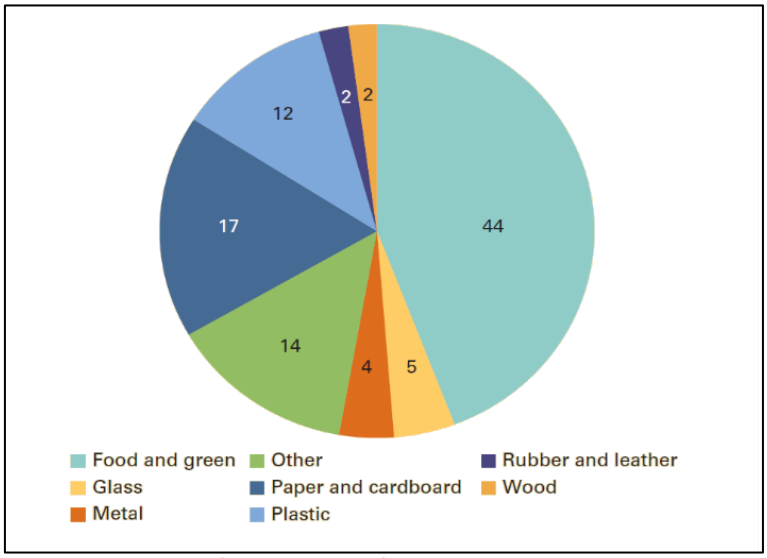

Figure 1. *Global waste composition (%). (Source: https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html).*

Waste by-products generate serious environmental issues during generation and disposal to the end-of-life. Traditional waste disposal/management methods could cause serious ecological, financial, and social concerns that hinder the achievement of the United Nations Sustainable Development Goals (Junaid et al., 2022). Indeed, at least 33% of the produced waste is not disposed of in an environmentally friendly system (World Bank, 2024). Poor management of natural resources increases unsustainability and negatively impacts on the ecosystem. Uncontrolled disposal (figure 2) causes serious heavy metal pollution in the aquatic environment, soil, and plants. At the same time, open burning causes emissions of CO_2 and other dangerous pollutants that damage the atmosphere, posing serious risks to human health and the environment itself. As a result, inadequate waste management raises serious and varied environmental and social problems, impeding progress towards a real sustainable development (Ferronato & Torretta, 2019).

Figure 2. *Waste disposed in landfills. (Source: https://www.focus.it/ambiente/ecologia/focus-next-30-riciclo-rifiuti-ieri-oggi-domani)*

Successfully tackling waste challenges requires a thorough understanding of the various types and categories to which waste belongs. For the policy-makers and government agencies, the waste definition and classification, according to environmental and human health risks, are of paramount importance to ensure a proper and efficient waste management. There are different classification methodologies that consider origin, composition, hazard, and other factors, as shown in figure 3.

Figure 3. *Waste classification overview. (Source: https://sisu.ut.ee/waste/11-definition-and-classification-waste/).*

Moreover, the increasing quantity of produced Municipal Solid Waste (MSW) is an uncontrollable challenge that requires immediate attention. MSW can be defined as the unwanted remains produced by households, institutions, industries, construction and demolition sites, commercial activities, etc. (Sondh et al., 2024). The concern arises by considering that about half of the world's population actually lives in urban areas, with a projected increase to 66% by 2050. All such increasign population consumes goods and produces wastes, MSW specifically. Hence, according to World Bank statistics, the total amount of MSW generated globally amounts to about 2.01 billion tonnes yearly. However, it is extremely worrying that about one third of that is not managed properly and ends up in treatment and disposal processes that are extremely harmful to the environment (World Bank, 2024).

The "Zero Waste" concept is an ambitious goal to tackle the growing waste problem and promote sustainability (Zero Waste Europe Report, 2023). First proposed in 1973 to combat chemical wastes, it has since been adopted by governments to develop zero-waste strategies able to increase sustainability. For example, the municipality of San Francisco (CA, USA) has committed to reducing MSW generation by 15% and landfilling and incineration by 50% by 2030. NGOs such as Zero Waste International Alliance, Zero Waste European and small communities have joined together to promote the idea of Zero Waste. However, theoretical guidance for the development of region-specific implementation strategies is still lacking worldwide (Chu et al., 2023).

THE EUROPEAN UNION'S APPROACH TO WASTE MANAGEMENT: STRATEGIES AND REGULATORY FRAMEWORK

Due to the vast issue of wastes generation and the environment degradation, the EU has placed the waste management at the heart of its environmental policies since 1973, with the aim of reducing the associate environmental impact. More recently, another key objective became the promotion of a real and complete CE, seen as a viable solution to waste minimisation. Over the years, EU issued and implemented a series of Action Programmes that showed a gradual evolution towards a more comprehensive and ambitious approach to waste management [European Environment Agency, 2020; Galletti, 2020)

the first programme (1973-1992) focused mainly on the reduction of the pollution associated to wastes, optimising landfill management and promoting recycling, as well as introducing specific directives to regulate the treatment of hazardous wastes, packaging and exhausted oils;

the interim programmes (1993-2010) implemented specific targets to reduce waste generation strengthening the principle of extended producer responsibility and introduced recycling with novel technologies and approaches;

the recent programmes (2011-present) adopted increasing CE approaches, aimed to transform EU into a resource-efficient society with ambitious plans to reduce waste generation, increase reuse and recycling practices, ensure a safe disposal of non-recyclable waste, and promote more sustainable consumption patterns.

The evolution of the action programmes reflects the EU's growing commitment to sustainable waste management and the adoption of a more circular economic model, with the aim of protecting the environment and ensuring a more sustainable future for the next generations. The EU uses legislation to translate what has been outlined in general terms during the planning phase into concrete actions, using directives, regulations, and decisions.

In 1975, the European Council adopted the first directive on waste, known as the Waste Framework Directive 75/442/EC. This directive established for the first time ever general basic measures for the management of all types of waste, including the hazardous ones, thus laying the regulatory basis for waste management at EU level. Among the priority objectives of this directive were the protection of human health and the environment from risks arising from wrong or not/low efficacious waste management. Furthermore, the directive provided a definition of waste as "any substance or object in the categories set out in appendix 1 which the holder discards or intends or is required to discard". The definition helps to identify which materials need to be managed correctly to avoid polluting the environment and harming public health, which can be recycled and recovered, and which can be sustainably managed.

In 1991, the Framework Directive 75/442/EC was modified by the new Directive 91/689/EEC, which introduced more stringent provisions for the management and monitoring of hazardous wastes. The objectives of Directive 91/689/EEC was forcing the EU Member States to adopt measures aimed at preventing, or at least reducing, the hazardousness of waste and, where possible, promoting wastes reuse through recycling or other forms of recovery.

In the field of treatment operation legislation, the Directive 1999/31/EC, also known as the "Landfill Directive", was adopted with the aim of reducing the environmental impact of landfills and promoting more sustainable wastes disposal alternatives by setting strict standards for the design, operation, and closure of landfills.

A fundamental step was the Commission Decision 2000/532/EC that established the European Waste Catalogue (EWC). EWC was designed with the aim of replacing the previous list of hazardous wastes, unifying into a single, more complete, and organised document for a more efficient and standardised waste management in the EU. EWC is divided into 20 categories (chapters) identified by a two-digit code. Each chapter is further subdivided into subcategories that specifically identify different types of waste. That detailed subdivision is designed to facilitate the identification and classification of every waste, ensuring uniform application of regulations across the EU Rifiutoo, 2024. The EWC structure is sumamrised in figure 4.

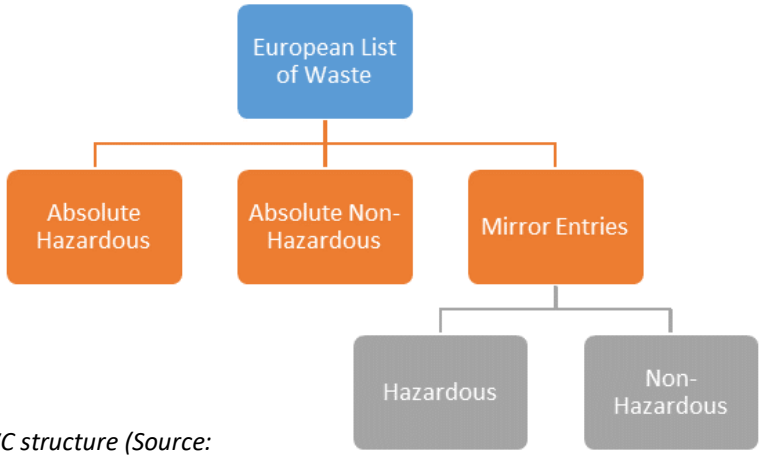

Figure 4. *EWC structure (Source: https://era.org.mt/topic/list-of-waste/)*

The former Directive 75/442/EC was replaced by Directive 2006/12/EC on waste that highlighted the importance for the Member States to act to reduce wastes generation. In particular, that directive focused on the adoption of clean technologies and the promotion of products that can be specifically recycled and reused.

Subsequently, two years later the Waste Framework Directive 2008/98/EC expanded and strengthened the principles and objectives introduced by the previous one, providing a more detailed and specific framework for waste management in the EU. This directive is a fundamental pillar of the European waste management legislation and aims to promote a sustainable waste management across whole the EU, minimising environmental impact and promoting the transition to a CE. The directive defines a waste hierarchy (article 4), the cornerstone of EU waste policies and legislation, which prioritises the actions to be taken for an optimal and sustainable waste management. Represented in the form of an inverted pyramid (figure 5), at the top of the hierarchy there is "Prevention", which involves at first avoiding the generation of wastes. That is followed by "Reuse", which involves giving products or materials a second life, rather than disposing of as waste. After comes "Recycling", that is processing wastes to obtain novel materials or products. Then there is energy "Recovery", which represents using wastes as a source of energy. Finally, there is "Disposal", considered the least desirable option, consisting in eliminating non-recoverable or non-recyclable wastes by storing in landfills (Waste Framework Directive, 2024).

Figure 5. *Wastes hierarchy as described by European framework on wastes. (Source: https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en).*

The Framework Directive also defines the fundamental distinction between the concepts of "waste" and "by-products". The main difference (table 1) lies in their destination and status. More particularly, "waste" is a material that no longer shows any direct use and, consequently, must be managed as such to avoid environmental damage, whereas a "by-product" is a material that can be reused directly without further processing and, hence, still have an economic value (Government of India et al., 2024).

Difference Basis	Waste	By-product
Usability	Has no further use in production, conversion, or consumption	Can be reused for production, conversion, or consumption
Feasibility	Not Feasible to be used as a product	Feasible to be used as a product
Environmental impact	Shows harmful impact on the natural environment	Is environment friendly with no harmful effect
Reuse	Is not recycled or reused at place of generation	Is recycled or reused at place of generation

Table 1. *Main differences between "waste" and "by-products".*

In 2015, the European Commission presented a package on the CE that is considered a crucial turning point from the past, outlining a new shared philosophy and a change of mentality that was indispensable to achieve priority targets, particularly with regard to separate collection. The package included a series of legislative proposals and programmes to promote and improve the CE. Among the most relevant proposals, the reform of the Waste Directive and an Action Plan on the Circular Economy are noteworthy (European Parliament, 2023).

As part of a package of measures on the CE, Directive (EU) 2018/851 amended the previous Directive 2008/98/EC and set more ambitious targets for waste recycling. In particular, Member States have to work towards a recycling rate of 55% by 2025, and 65% by 2035 for municipal waste, as well as specific targets for other types of waste, such as construction and industrial waste. The directive promotes also the adoption of practices and technologies that

could foster the CE, such as the eco-design of products, the extension of the useful life of materials and products, and the adoption of more sustainable production and consumption patterns (European Parliament, 2023).

In 2020, the European Commission launched the new Action Plan, focused on eco-friendly products, waste reduction, and citizen involvement. In the intervening years, the European Parliament has worked to promote a fully CE by 2050, with stricter recycling regulations and binding targets for 2030, the Sustainable Development Goals of the 2030 Agenda. Particular emphasis was placed on the transition to an improved CE, including the enhancement of sustainable products deriving from different sectors. Other new European packaging rules have been proposed, with design improvements, clear labelling, and promotion of reuse and recycling, as well as a transition to more environmentally friendly plastic (European Council of the European Union, 2024). In fact, the European Parliament recently approved new measures on packaging to make it more sustainable, with reduction targets of 5% by 2030, 10% by 2035, and 15% by 2040 (European Parliament, 2023).

Importantly, over the years, specific directives have been introduced to manage various and particular waste streams. These include the Packaging Waste Directive 94/62/EC the Waste Electrical and Electronic Equipment (WEEE) Directive 2012/19/EU, [Dırectıve 2012/19/Eu of the European Parlıament and of the Councıl of 4 July 2012 on waste electrical and electronic equipment. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012L0019] the End-of-Life Vehicles Directive 2000/53/EC and the Waste Electrical and Electronic Equipment Directive 2002/96/EC. Subsequently, these directives were subject to amendments and updates as part of the Green Deal.

The substantial change in perspective on the environment, from an unlimited resource to an asset to be preserved and trasmitted to thefuture generations, has driven the adoption of environmental policies and strategies aimed at promoting sustainable resource management and reducing the environmental impact of waste. EU efforts indicate a growing awareness of the importance of environmental sustainability and the need to take concrete measures to protect our planet and its resources for future generations.

The main waste disposal methods

An effective solid waste management system offers a solution, allowing secondary materials and energy to be generated without compromising the balance of the ecosystem. That system works to manage wastes by providing an additional source of raw materials and energy, contributing to the CE and the overall sustainability of the global industrial system. In addition to the legislative aspects, waste management includes all treatment processes, as summarised in figure 6. Treatment consists of a series of technical operations specifically designed to ensure that the considered waste, regardless of its final destination, has the least possible impact on the environment (Sondh et al., 2024).

Disposal in landfills is the most common method and the least desirable option in the waste hierarchy (cf. Figure 5). In fact, landfilling poses a threat to the environment if not properly managed, especially due to potential leachate leakage and greenhouse gas emissions (Sondh et al., 2024). Therefore, many environmental policies focus on reducing dependence on landfill through other more sustainable waste management practices.

Generally speaking, waste disposal techniques are varied and can be divided into two main categories: a) biochemical and b) thermochemical methods. The former involves biological or chemical processes that occur in the presence of microorganisms or biological substances. For example, anaerobic digestion and composting fall into this category. On the other hand, thermochemical methods involve chemical reactions at high temperatures. Incineration, gasification, and pyrolysis are examples of thermochemical methods (Hidalgo et al., 2019; Sondh et al., 2024).

However, reuse of waste and recycling of materials is favoured due to conscious efforts worldwide to preserve traditional natural resources and ensure environmental security. In the CE approach, materials are regarded as valuable resources and recycling becomes the preferred method of waste management. This approach promotes a closed loop in which materials are constantly recovered, processed and reused, reducing dependence on virgin resources and limiting waste (Kylili & Fokaides, 2017).

Industrial symbiosis, as subset of industrial ecology, on the other hand, seeks to create synergies between different companies to maximise efficiency and reduce waste by sharing resources, materials, energy and knowledge. That will create mutually profitable financial transactions, improve business, favour technical processes improvement, and foster eco-innovation and long-term culture change (Lombardi et al., 2012). These strategies are key to promoting sustainable waste management and contributing to the transition to a greener, CE.

Figure 6. *Comparative diagram of the technical features of various waste treatment methods. (Source: Sondh et al. 2024 https://doi.org/10.1016/j.scp.2023.101337).*

WASTE REUSE IN THE CONSTRUCTION SECTOR: A VIABLE SOLUTION TO INCREASE SUSTAINABILITY

The importance of the CE is reflected in various industrial sectors, including construction, where it could play a key role in protecting the environment and increase sustainability. Construction, indeed, plays a crucial role in the global environmental landscape. In fact, buildings are responsible of a considerable share of the world's energy consumption, contributing of about 40% of the total, as well as emitting 36% of the global CO_2 emissions [Commissione Europea, 2023). These data highlight the importance of addressing environmental challenges in the construction sector, with a particular focus on building and construction materials. The production, transport, use, and disposal of these materials are critical factors affecting the overall environmental impact. To counter this, several strategies have been developed, including the adoption of environmentally friendly materials that recycle or reuse waste (Cintura et al., 2021). This strategy can effectively reduce the environmental impact of buildings throughout their life cycle. For example, the extensive use of biomaterials in construction offers significant advantages. Because they are renewable natural sources, these materials not only help capture carbon dioxide from

the atmosphere, but also store it in biomass during the construction process. This process of removal and long-term storage of CO_2 has a positive impact on the earth's climate and actively contributes to climate change mitigation (Pittau et al., 2018).

Therefore, in the following sections, the results of different studies on the characteristics of environmentally sustainable building materials manufactured reusing various types of waste will be analysedwith the aim of considering its possible applicability into the construction sector.

ORGANIC WASTE

Organic wastes derive from plants or animals and are biodegradable materials. Coming from a variety of sectors - such as households, food, vegetable, paper, animal husbandry, herbal, and market - these wastes represent a source of concern for the human health due to the potential coliform contamination, emissions of nocive gases during decomposition, ability to spread disease, beyond an unpleasant odour (Ashokkumar et al., 2022).

Turning these wastes into sustainable resources for the construction industry has become extremely interesting. Moreover, their reuse shows a promising improvement in the properties of traditional building and construction materials. In general, the idea of reusing alternative organic wastes as additional raw materials in concretes or mortars is largely increasing worldwide, with examples including straw, rice husks, maize, banana, wheat, pomace and other for the resulting improved properties and for the increased sustainability of the final products (Prusty et al., 2015; Luhar et al., 2019)

For example, sugar cane bagasse, a fibrous residue from sugar cane processing, was reused to manipulate the thermal properties of cement composites (Onésippe et al., 2010), revealing that that the addition of bagasse fibres reduced the thermal conductivity and geberated lower specific heat. More particularly, it was reported that the thermal conductivity dropped from 0.62 W/mK to 0.46 W/mK. The same waste, in the form of ash, was reused as substitute for sand obtaining similar results to a conventional mortar (Sales et al., 2010). Furthermore, various tyoes of organic residues containing long cellulose fibres, such as sawdust and tobacco residues, were reused in the manufacture of clay bricks, leading to an insulating capacity, and porosity, increase (Demir, 2008). Moreover, bricks manufacture by extrusion was not affected by the fibrous nature of such residues. Olive wastes were recently reused as a partial substitute for natural sand in concrete and cement mortars. For example, olive stones were used to replace clinker in concrete with a 365 days compressive strength of 50 MPa for mortars containing 10% waste, compared to 51.35 MPa for the reference mortar, with a satisfactory result (Lila et al., 2020). Olive pomace was reused as component for biocomposite materials contributing to the improvement of buildings energy efficiency. Other reported use is as additive in lightweight bricks with an increased porosity and consequent insulating properties (La Rubia-Garcìa et al., 2012). Banana leaves were incorporated into mortars, showing that the very thin particles could provide a filling effect with an increased tensile and compressive strengths, with a reduction in the corrosion tendency for the reinforced concrete (Kanning et al., 2014). Spent coffee ground was reused to replace sand, up to 15%, in biocomposite mortars with a significant improvement of the insulating properties with a reduction of up to 72% in thermal conductivity compared to reference mortars, making the newly developed mortars a promising alternative to traditional structural materials (Saeli et al., 2023). Aquaculture by-products such as mollusks shells were also tested in traditional mortars as recycled aggregate to totally replace the traditional sand. Moreover, mussel shells reused showed a further 40% improvement in energy behaviour compared to a traditional mortar (Leone et al., 2023).

The reuse of organic wastes into building and construction materials as secondary raw materials offers numerous environmental benefits, including reducing the amount of disposed and the environmental impact associated with the extraction and production of traditional sources, along with promoting CE. However, it is crucial to carefully consider the selection and integration of organic wastes into construction materials to ensure their safety, durability, and performance over time. Scientific research continues to advance in this field, with the development of novel technologies and innovative materials that could offer new opportunities for the sustainable use of organic wastes in the construction industry.

INDUSTRIAL WASTE

Industrial wastes also show a variety of characteristics that vary from sector to sector, and plant to plant. Of these, paper mill sludge, meat processing waste, brewery residues, and textile fibres constitute only a part of the organic fraction of the available industrial wastes (Ashokkumar et al., 2022). Besides these, however, there are also many hazardous wastes whose generation and disposition can cause serious damage to the environment, and the human health. Additionally, their quantity is increasing on a global scale. In addition to greenhouse gas emissions, industrial wastes such as steel slag, ferronickel, copper, and bauxite residues, such as red mud, contribute to that problem (Madurwar et al., 2013). Hence, the reuse of materials deriving from industrial wastes for applications in construction has the dual benefit of reducing the overall volume of waste and offering a long-term solution to reduce carbon dioxide emissions. Therefore, it is crucial to consider the environmental impact of such practices. At the same time, it is essential to carefully evaluate the microstructure of these wastes, as that could affect the final performance of a material/component/product, including durability and mechanical properties (Kurniati et al., 2023).

In recent decades, red mud is ione of the most investigated waste, including its use as a fuel, the recovery of metals or rare elements, the preparation of catalysts, and gas purification. Due to the abundance of components such as SiO2, Al2O3, CaO, and Fe2O3, red mud is considered a suitable raw material for the production of construction materials such as cement, ultra-high-performance concrete, geopolymers, blocks, and ceramic granules. Among these, the production of artificial aggregates from recycled red mud is gradually becoming a priority research objective (Wang et al., 2024). A precise mixing ratio between red mud and bottom ash from municipal waste incineration was proved to significantly optimise the properties of aggregates in a given sintering process (Sun et al., 2021). The aggregate achieved its best performance when the two raw materials were mixed in a 1:1 ratio and sintered at 1070°C. In contrast, a combination of red mud, excavated clay, and sewage sludge was used to produce sintered aggregates with a highly absorbent performance, also suitable for uses in urban environments (Molineux et al., 2016)

A predominant waste production from the metallurgical industry is the steel slag, a solid residue generated during the iron and steel process of melting. Recently, steel slag aggregates have attracted increasing interest as a potential resource in construction and civil engineering. In addition to the use in pavement rehabilitation, these slags are also used for radiation-resistant materials, innovative concrete, and in geopolymer technology. This diversification of uses reflects the recognition of the inherent qualities of slag, such as its strength and durability, as well as its ability to contribute to innovative and sustainable construction solutions (Wang et al., 2024)Just for example, steel slag was used with a 50% replacement rate to prepare an innovative steam-compacted aggregate that showed excellent mechanical properties, volumetric stability, and durability when used in concrete (Chen et al., 2023). Similar results were obtained for high-temperature treated steel slag introduced into mortars and concretes, with replacement rates up to 30%. Although the high water absorption of steel slag can decrease the density of hydration products, it is likely that the performance improvement was mainly due to the density of the particles (Vo et al., 2023). Also ashes deriving from various industrial activities found various applications in the civil engineering sector as an economical and practical alternative for the development of building materials.

Pond ash from coal-fired power plant was used as fine aggregate and cement substitution up to 40% resulting in improved strength (Lal et al., 2019). Also ashes from end-of-life tyres were tested as partial substitution for sand in the manufacture of cementitious mortars. There, a superior compressive strength was observed in comparison to a reference mortar. In addition, mixtures containing 5% and 10% ash exhibited greater resistance to frost and thaw damage and chloride ion penetration than the control mortar (Al-Akhras et al., 2004). Steel slag and fly ash were incorporated into alkali-activated cements to increase the overall porosity for the production of high thermal performance façade panels. The results showed conductivity values below the threshold of 0.2 W/mK, with a compressive strengths of 2.5 Mpa (Cristelo et al., 2023). Industrial wastes can resemble natural aggregates after proper pre-treatments. However, the likely release of heavy metals can pose many environmental concerns. Hence, it is essential developing appropriate strategies to balance high substitution rates and, at the same time, mitigate environmental impacts. Many mining or

refining wastes show high toxicities and storage problems without a clear direct economic destination. R&D should focus on the characterisation of such wastes and in their use to reduce the land and economic burden. In addition, it is important to examine the effects of weathering and degradation due to the pozzolanic activity during long-term storage of slag and processing residues, constituting an area of interest for future research (Wang et al., 2024).

PLASTIC WASTE

Plastic waste is inorganic, non-biodegradable, and – as largely known - poses several threats to the ecosystem. Due to rapid developments in various sectors, there has been a significant increase in plastic waste generation. When considering the alternatives of incineration and landfilling, recycling and reuse emerge as much more convenient and energy-efficient solutions. Therefore, finding viable alternative methods to recycle plastic waste in construction could lead to the production of environmentally sustainable building materials in a non-polluted environment and reduce construction costs (Hamada et al., 2024).

The conducted research so far, used plastic wastes as raw materials for applications in construction, as it offers multiple possibilities of use. For example, polyethylene terephthalate (PET) plastic waste was reused to generate a new class of concretes. The main results showed a 40% decrease in compressive strength compared to conventional concrete, but a 50% improvement in thermal performance due to increased air voids (Ahmed et al., 2022; Halim et al., 2020) Polypropylene (PP) wastes was investigated as aggregate in mortars leading to reduced density with plastic increase (Hita et al., 2018)

Previous studies investigating plastic wastes as aggregates in various construction materials showed promising results. Concretes, mortars, bricks, and paving blocks with plastic aggregates demonstrated greater durability than traditional materials. The use of plastic waste in the construction industry can be one of the best alternatives to natural aggregates, reducing environmental problems and helping to contain the manufacturing costs. However, it is essential to conduct a careful feasibility analysis and life cycle assessment to properly understand environmental impacts and other properties such as fire resistance, frost resistance, and release of toxic fumes during combustion (Hamada et al., 2024).

CONCLUSIONS

Wastes generation and disposal is a growing global challenge, threatening the environment, causing pollution, soil degradation, and public health risks. This study focuses on European legislation on the classification and management of the most diffused wastes, highlighting the shift from viewing the environment as an unlimited resource to one that must be preserved. The EU's efforts to promote environmental sustainability and protect the planet's resources are highlighted. In particular, the opportunities and advantages of reusing wastes in construction, such as organic, industrial and plastic ones, are analysed, with the aim of promoting environmentally friendly and innovative solutions in line with the objectives of the circular economy and industrial symbiosis.

This shows that: despite the numerous efforts to transform organic wastes into sustainable resources for the construction industry with considerable properties improvements, there are still aspects to be carefully considered. The use of organic waste, indeed, offers many environmental advantages such as reducing the number of wastes to be disposed of and decreasing the environmental impact associated with the extraction and production of traditional materials. However, organics integration requires careful evaluation to ensure safety, durability, and performance over time. Possible limits are due, for instance, to the presence of organic matter that could favour the proliferation of bacteria and mould, compromising buildings indoor air quality, and causing potential health problems for the occupants.

The use of industrial wastes in building materials might offer significant advantages in terms of environmental and economic sustainability. However, it is crucial to proceed with caution and take a rigorous, scientific approach to assessing potential risks and developing appropriate strategies to mitigate them. That because some of these wastes may contain heavy metals and other harmful substances that could be released into the natural environment over

time if not properly treated. Finally, building materials containing recycled plastics might present positive characteristics such as light weight, corrosion resistance, and insulating properties. However, the use of plastic waste presents many challenges regarding the release of harmful substances during fires, the durability, and the environmental impact throughout the life cycle of products.

Responsibilities regarding waste management in building and construction materials should not fall solely on producers. Sectors that produce wastes must ensure safe and responsible management to make them suitable for reuse. It is crucial to promote collaboration between different actors, such as researchers, manufacturers, construction companies, policy makers, and citizens, to develop innovative and sustainable solutions. The adoption of a circular economy approach, where waste is considered a resource, is essential for the efficient and sustainable use of industrial wastes in novel materials for applications in construction. R&D continues to advance, offering new technologies and innovative solutions. However, it is important to address the risks associated with the use of such materials with quality control and compliance with environmental and safety regulations.

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REFERENCES

Agovino, M., Cerciello, M., Javed, A., & Rapposelli, A. (2023). Environmental legislation and waste management efficiency in Italian regions in view of circular economy goals. Utilities Policy, 85, 101675.

Ahmed, K., & Yousif, K. M. (2022). An investigation of the use of plastic waste as aggregate in concrete. Journal of Civil Engineering Frontiers, 3(02), Article 02.

Al-Akhras, N. M., & Smadi, M. M. (2004). Properties of tire rubber ash mortar. Cement and Concrete Composites, 26(7), 821-826.

Ashokkumar, V., Flora, G., Venkatkarthick, R., SenthilKannan, K., Kuppam, C., Mary Stephy, G., Kamyab, H., Chen, W.-H., Thomas, J., & Ngamcharussrivichai, C. (2022). Advanced technologies on the sustainable approaches for conversion of organic waste to valuable bioproducts: Emerging circular bioeconomy perspective. Fuel, 324, 124313.

Chen, Z., Huang, L., Yan, L., Cai, H., Luo, X., & Li, Y. (2023). Autoclaved steel slag coarse aggregate: A potential solution for sustainable concrete production. Construction and Building Materials, 400, 132627.

Chioatto, E., & Sospiro, P. (2023). Transition from waste management to circular economy: The European Union roadmap. Environment, Development and Sustainability, 25(1), 249–276.

Chu, Z., Li, Q., Zhou, A., Zhang, W., Huang, W., & Wang, J. (2023). Strategy formulation path towards zero-waste of municipal solid waste: A case study from Shanghai. Journal of Cleaner Production, 418, 138091.

Cintura, E., Nunes, L., Esteves, B., & Faria, P. (2021). Agro-industrial wastes as building insulation materials: A review and challenges for Euro-Mediterranean countries. Industrial Crops and Products, 171, 113833.

Commission Decision of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes, available at: https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=CELEX:32000D0532

European Commission, 2023. Energy Performance of Buildings Directivem, available at: https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficient-buildings/energy-performance-buildings-directive_en.

Council Directive 75/442/EEC of 15 July 1975 on waste, available at: https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=CELEX:01975L0442-19911223&from=LV.

Council Directive 91/689/EEC of 12 December 1991 on hazardous waste, available at: https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=CELEX:31991L0689&rid=2.

Cristelo, N., Maia, J., Ramos, et al. (2023). Development of highly porous alkaline cements from industrial waste for thermal insulation of building envelops. Construction and Building Materials, 409, 134068.

Demir, I. (2008). Effect of organic residues addition on the technological properties of clay bricks. Waste Management, 28(3), 622–627.

European Parliament Directive (EU) 2018/851, available at: https://eur-lex.europa.eu/eli/dir/2018/851/oj/ita/pdf.

European Council, Directive 1999/31/EC on the landfill of waste, available at: https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=CELEX:01999L0031-20180704&qid=1711348855283].

European Parliament, Directive 2000/53/EC on end-of life vehicles, available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32000L0053.

European Parliament, Directive 2002/96/EC on waste electrical and electronic equipment, available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32002L009.

European Parliament, Directive 2006/12/EC on waste, available at: https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=CELEX:32006L0012&from=EN

European Parliament, Directive 2008/98/EC on waste, available at: https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=CELEX:02008L0098-20150731&from=ET

European Council, 2024. Circular economy, available at: https://www.consilium.europa.eu/it/policies/circular-economy/.

European Environment Agency (2020). Waste management, available at: https://www.eea.europa.eu/themes/waste.

European Parliament, Directive 94/62/EC on packaging and packaging waste, availabe at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31994L0062

European Parliament, 2023. Efficienza delle risorse ed economia circolare, available at: https://www.europarl.europa.eu/factsheets/it/sheet/76/efficienza-delle-risorse-ed-economia-circolare.

European Parliament, 2024. Imballaggi: via libera a nuove norme UE su riduzione, riuso e riciclo, available at: https://www.europarl.europa.eu/news/it/press-room/20240419IPR20589/imballaggi-via-libera-a-nuove-norme-ue-su-riduzione-riuso-e-riciclo#:~:text=The%20rules%2C%20fruit%20of%20a%20waste%20in%20plastics.

Ferronato, N., & Torretta, V. (2019). Waste Mismanagement in Developing Countries: A Review of Global Issues. International Journal of Environmental Research and Public Health, 16(6), Article 6.

Government of India, Ministry of Environment, Forest and Climate Change, Central Pollution Control Board, Hazardous Waste Management Rules, 2024, available at: https://cpcb.nic.in/rules/.

Halim, N. F. A., Taib, N., & Aziz, Z. A. (2020, April). The performance of thermal property in concrete containing waste pet (polyethylene terephthalate) as an alternative sustainable building material. In IOP Conference Series: Earth and Environmental Science (Vol. 452, No. 1, p. 012108). IOP Publishing.

Hamada, H. M., Al-Attar, A., Abed, F., et al., (2024). Enhancing sustainability in concrete construction: A comprehensive review of plastic waste as an aggregate material. Sustainable Materials and Technologies, 40, e00877.

Hidalgo, D., Martín-Marroquín, J. M., & Corona, F. (2019). A multi-waste management concept as a basis towards a circular economy model. Renewable and Sustainable Energy Reviews, 111, 481–489.

Hita, P. R., Pérez-Gálvez, F., et al., (2018). Reuse of plastic waste of mixed polypropylene as aggregate in mortars for the manufacture of pieces for restoring jack arch floors with timber beams. Journal of Cleaner Production, 198, 1515-1525.

Junaid, M. F., Rehman, Z. ur, Kuruc, M., Medveď, I., Bačinskas, D., Čurpek, J., Čekon, M., Ijaz, N., & Ansari, W. S. (2022). Lightweight concrete from a perspective of sustainable reuse of waste byproducts. Construction and Building Materials, 319, 126061.

Kanning, R. C., Portella, K. F., Bragança, M. O. G. P., Bonato, M. M., & dos Santos, J. C. M. (2014). Banana leaves ashes as pozzolan for concrete and mortar of Portland cement. Construction and Building Materials, 54, 460–465.

Kurniati, E. O., Pederson, F., & Kim, H.-J. (2023). Application of steel slags, ferronickel slags, and copper mining waste as construction materials: A review. Resources, Conservation and Recycling, 198, 107175.

Kylili, A., & Fokaides, P. A. (2017). Policy trends for the sustainability assessment of construction materials: A review. Sustainable Cities and Society, 35, 280-288.

La Rubia-García, M. D., Yebra-Rodríguez, Á., Eliche-Quesada, D., Corpas-Iglesias, F. A., & López-Galindo, A. (2012). Assessment of olive mill solid residue (pomace) as an additive in lightweight brick production. Construction and Building Materials, 36, 495–500.

Lal, D., Chatterjee, A., & Dwivedi, A. (2019). Investigation of properties of cement mortar incorporating pond ash - An environmental sustainable material. Construction and Building Materials, 209, 20-31.

Leone, R., Calà, A., Capela, M. N., Colajanni, S., Campisi, T., & Saeli, M. (2023). Recycling Mussel Shells as Secondary Sources in Green Construction Materials: A Preliminary Assessment. Sustainability, 15(4), Article 4.

Lila, K., Belaadi, S., Solimando, R., & Zirour, F. R. (2020). Valorisation of organic waste: Use of olive kernels and pomace for cement manufacture. Journal of Cleaner Production, 277, 123703.

Lombardi D. Rachel, Laybourn Peter, Redefining Industrial Symbiosis, Journal of Industrial Ecology 16(19) (2012), 28-37.

Luhar, S., Cheng, T.-W., & Luhar, I. (2019). Incorporation of natural waste from agricultural and aquacultural farming as supplementary materials with green concrete: A review. Composites Part B: Engineering, 175, 107076.

MacArthur, E. Towards the Circular Economy: Economic Business Rationale for an Accelerated Transition; Ellen MacArthur Foundation:Cowes, UK, 2012; pp. 22-25.

Madurwar, M. V., Ralegaonkar, R. V., & Mandavgane, S. A. (2013). Application of agro-waste for sustainable construction materials: A review. Construction and Building Materials, 38, 872-878.

Molineux, C. J., Newport, D. J., Ayati, B., Wang, C., Connop, S. P., & Green, J. E. (2016). Bauxite residue (red mud) as a pulverised fuel ash substitute in the manufacture of lightweight aggregate. Journal of Cleaner Production, 112, 401–408.

Onésippe, C., Passe-Coutrin, N., Toro, F., Delvasto, S., Bilba, K., & Arsène, M.-A. (2010). Sugar cane bagasse fibres reinforced cement composites: Thermal considerations. Composites Part A: Applied Science and Manufacturing, 41(4), 549–556.

Pittau, F., Krause, F., Lumia, G., & Habert, G. (2018). Fast-growing bio-based materials as an opportunity for storing carbon in exterior walls. Building and Environment, 129, 117–129.

Prusty, J. K., & Patro, S. K. (2015). Properties of fresh and hardened concrete using agro-waste as partial replacement of coarse aggregate - A review. Construction and Building Materials, 82, 101-113.

Rifiutoo, 2024. Cos'è il CER?, available at: https://www.rifiutoo.com/cer-catalogo-rifiuti/.

Rivista-2020-N3-art.15.Galletti. (n.d.), available at: http://www.foroeuropa.it/index.php?option=com_content&view=article&id=656:rivista-2020-n3-art-15-galletti&catid=98:rivista-2020-n3&Itemid=101.

Saeli, M., Capela, M.N., Piccirillo, C., et al., (2023). Development of energy-saving innovative hydraulic mortars reusing spent coffee ground for applications in construction. Journal of Cleaner Production, 399, 136664.

Sales, A., & Lima, S. A. (2010). Use of Brazilian sugarcane bagasse ash in concrete as sand replacement. Waste Management, 30(6), 1114–1122.

Sondh, S., Upadhyay, D. S., Patel, S., & Patel, R. N. (2024). Strategic approach towards sustainability by promoting circular economy-based municipal solid waste management system- A review. Sustainable Chemistry and Pharmacy, 37, 101337.

Sun, Y., Li, J., Chen, Z., et al., (2021). Production of lightweight aggregate ceramsite from red mud and municipal solid waste incineration bottom ash: Mechanism and optimisation. Construction and Building Materials, 287, 122993.

United Nations, 2024, available at: https://www.un.org/en

Vo, D.-H., Tran Thi, et al., (2023). Engineering properties and stability of high-performance mortar incorporating untreated and treated steel reducing slag aggregate. Journal of Building Engineering, 67, 105992.

Wang, J., & Dong, H. (2024). Preparation and application of multi-source solid wastes as clean aggregates: A comprehensive review. Construction and Building Materials, 418, 135414.

Waste Framework Directive, 2024, available at: https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en.

World Bank, 2024, available at: https://datatopics.worldbank.org/what-a waste/trends_in_solid_waste_management.html.

World Commission on Environment and Development, 1987. "Our Common Future." Oxford University Press.

Zero Waste Europe Report, 2023, available at: https://zerowasteeurope.eu/

EXAMINATION OF PUBLIC SPACE AND ITS USERS IN THE CONTEXT OF PERFORMATIVITY: AN EXAMPLE FROM ISTANBUL

GÜLİZ SEVGİ KABASOĞLU, FATMA AHSEN ÖZSOY

Güliz Sevgi Kabasoğlu, PhD Candidate, ITU, **Fatma Ahsen Özsoy,** Prof. Dr., Işık University

ABSTRACT

This study examines public space and its practices in the context of the concept of "performativity" in light of Lefebvre's "social production of space" and "differential space" discourses. The main purpose of this study is to argue that the production of performative space is a powerful method to ensure the existence of desired public spaces in today's heterogeneous cities. In line with these views, this study aims to reveal the positions of the expert who designs the public space and the individual who is the user of the space, regarding the relationship between performativity and space and their reflections in everyday life. It is thought that the data obtained may benefit inquiries regarding future public space constructs.

In this study, public spaces are places where people socialize, construct, and express themselves/identities. At this point, the study is positioned specifically on the design/construction of public spaces by experts to produce a performative space. Performative space attracts attention with features that enable and, according to some, encourage its users to produce space as performers. In this context, the conditions of performative space are defined through discussions of the concept of performativity in various disciplines. These conditions are common to certain concepts. It is even suggested that can be gathered under the concept of "openness" based on Umberto Eco's "open work" theory. The methods of designing a space within the framework of the conditions of the performative space vary. We see that the formation of the designed space offers openness at different scales.

At this point, it examines how and why the formation, and constituent elements of the selected open public space were designed to achieve the purpose of the study in the context of performative space production. This review was conducted in three stages: First, representations of design are analysed in terms of whether they have the potential for performative space within the scope of the elements and formation of the space. Afterwards, it is determined on-site whether the area exactly reflects the design. Finally, in a meeting with the designer regarding the design process, it is learned whether there are details that cannot be transferred to the representations of the project. Considering the information obtained here, the users were also observed on certain days and periods. During this observation, it examines whether the space is used as it is or whether it experiences temporary transformations provided by the openness of the design.

To provide examples in this context:

Stairs designed with an open design concept between two levels (wider than standard size and open to different uses) offer opportunities other than transportation. Sometimes, it is a playground for children, and sometimes it is an area for social activities. The types and frequencies of these different uses can be examined and determined as parameters to produce a performative space.

While a seating unit (which is free of all restrictive elements and provides different usage areas for individuals) may be a breakfast table for some, it may be a tripod on which a photographer fixes his/her camera. In this example, it is observed whether users temporarily use this area for their purposes.

This study brings different perspectives and interpretations to public space designs and also serves as a suggestion for approaches in which the designer, while producing the space, can re-include the individuals who use the space in the design as agents for the reproduction of the space, instead of being just users.

INTRODUCTION

We can attribute the inclusion of the concept of performativity in the field of architecture to discussions in the field of theatre in the 1960s. During this period, the theatre had a purpose beyond the visualization of the written text. Productions have been realized in which it questioned the concepts of actors and audiences and changed them. These questions for the theatre have revealed new requirements for its space. These criticisms and alternative seeking have become a new path that opens the practical aspect of architecture intodiscussion. These discussions in the field of architecture motivate the search for alternatives regarding the conditions of the space where situations beyond the realization of actions are created; interactions and experiences in many aspects are experienced; and social, cultural, and spatial formations occur. Urban studies, which are in an inseparable interaction with architecture, bring the concept of performativity to their agendas with the same motivation. Of course, actions, spaces, and similar formations that involve performativity in urban spaces, especially public spaces, are not foreign. In urban life, these formations coexist in both formal and informal aspects. Depending on the configuration of the urban spaces, the definitions of these actions and spaces produced by users may differ. For example, if the setting of the space is created in a way that allows performative actions, it is possible that an informal action that normally occurs in a solid space will fall into the category of formal action in this space. In other words, we face questions that cause us to reconsider past developments in urban life. Ongoing studies in this field include discussions on the construction of architectural and/or urban spaces with features that encourage performative formations. Discussions on urban and public spaces in Turkey are widely held in the theoretical field. However, there has been slow progress in the number of examples put into practice with this design. However, the dynamics of this process, in which changes and developments occur, are promising.

This study, carried out in this context, examines the potential of public spaces, one of the important elements that make cities a living organism, to transform their users into agents. The aim here, as the main purpose of the study, is to reveal the effect design approaches, which are strong in theory and encourage the use of space and participation in space, have in practice in urban spaces and life. It is hoped that the inferences obtained here will contribute to important discussions on the renewal of existing public spaces in cities and the construction of new public spaces to be designed in the future.

In line with this purpose, this study is structured with a theoretical basis on the social and performative production of public spaces. The definition of the conditions necessary for the production of social and performative acts and their space is based on the questioning of the concept of performance in different disciplines, for example, linguistics, art, social sciences, and similar fields. Discussions in these disciplines create a perception of the conditions of performativity by giving rise to and influencing each other over time. There is no clear written truth on this subject; there are many opinions, but when they are examined together, the common points become clear. Under the leadership of these evident conditions, readings and analyses were conducted on place and actions. This structure of the study is an activity that increases the inclusiveness and use of performative spaces and actions, urban and public spaces, and reveals alternative ways to use, strengthens belonging to the place and society, contributes to the protection and development of the place by adopting it, and enables individuals to express and build themselves with the opportunity to become one with society. This is based on the argument that aspects that support their abilities are strong. We reach the motivation and importance of this study by arguing that public spaces are an effective catalyst for the development of cities and societies.

In line with this defence, the study first discussed individual-space interaction with the idea that space is a social production. Second, it opened up the ways in which the individual and the place produce each other in response to discussion in the context of the concept of performance and the conditions of performativity. Under the leadership of performative actions and the conditions of performative production of space, he examined the potential of the designed public space in the context of performativity, and the effects of these potentials on space and life. Finally, the (open) public space chosen within the scope of the study was

discussed in the context of the space's potential for performative actions and encouragement, if any. Reflections on the use of space were questioned in the context of performative production of space.

The methodological structure of the study was shaped by analysing the design concept of the selected open public space in the context of performative space design, observations made about the use of the space, and examination of the news and user comments related to the space on social media. The designs of the public spaces considered within the scope of the study were analysed in terms of their potential for the performative production of space. Observations have been made regarding the diversification of the use of public spaces and how users temporarily transform the space. Various inferences have been made by comparing the performative potential of the public space with the users' performative actions. The inferences obtained in the conclusion of the study are intended for open discussions that are thought to contribute to the development of the potential of the selected open public space for the realization of performative actions and the production of space, and perhaps to encourage the use of spaces in this direction.

THOUGHTS ON PUBLIC SPACE: A DEFENCE OF PERFORMATIVITY

In general, public space is a place that everyone can easily access, where is visible; that is, they have the opportunity to have a say in the public, where democracy is legitimized, where encounters and various actions are possible, where people socialize, where people can take part freely, that is, where they can express and build themselves, where they can participate in society. They can be described as places where culture and history were built. Owing to all these features attributed to public space, there are ongoing discussions about public spaces in many different disciplines. From these discussions, we address inquiries into the relationship between space and sociality, which is one of the expansions of the concept of space in social sciences, in order to position this study in theory. In the relationship between space and sociality, Lefebvre's discourses on public space, spatial practices, and the production of space constitute a pillar of this study's theoretical infrastructure. There are many discussions and theories in this context, but this study has limited this leg of theoretical infrastructure within the scope of Henri Lefebvre's social production of space and differential space. The theoretical part of the study was also supported by other concepts and theories in the background. We are sharing a few of them here for you to benefit from when necessary: Jan Gehl, William H. Whyte, Jane Jacobs, Richard Sennett, Edward Soja, Saskia Sasen, Karl Popper and Pierre Bourdieu on discussing the city at the individual-society scale; David Harvey on the right to live in the city and the social production of space, Michel de Certeau on everyday life and tactics, Pierre Bourdie on action theories, James J. Gibson on the theory of affordance, George Herbert Mead and Erving Goffman on the establishment of the self, Hans-George Gadamer on the relationship between interpreter and action.

In the introduction to The Production of Space, Henri Lefebvre reveals his own approach by questioning space with its different contexts and definitions from past to present. Some of the questions and problems that arise in these inquiries and that he wants to address constitute the plan for his book. In the purpose section of the book, various inferences and consequences regarding the thesis *"(Social) space is a (social) product"* (Lefevbre, 1991, p. 26) are discussed throughout the book. Every society produces its own space; in fact, this production becomes reciprocal. In other words, social existence is realized in the unity of space and action, and thus (one of the reasons) the bond of society with the space it produces is strengthened and it defends the space. "*Social space thus remains the space of society, of social life. Man does not live by words alone; all 'subjects' are situated in a space in which they must either recognize themselves or lose themselves, a space which they may both enjoy and modify"* (Lefevbre, 1991, p. 35). We would also like to add that the place mentioned here is not a single place. In fact, these multiple produced social spaces, and the social relations and actions inherent in this production penetrated each other. *"No space disappears in the course of growth and development: the worldwide does not abolish the local"* (Lefevbre, 1991, p. 86). At this point, we can talk about the cultural and historical experiences reflected in social space. Because social space is a product of production, it can be repeated and can give rise to repeated movements and performances.

Lefebvre mentioned that the analysis of social space has become complicated with the intertwining of modes of production, especially neo-capitalism. He groups these forms of production, which he frequently focuses on under three headings:

"1 Spatial practice, which embraces production and reproduction, and the particular locations and spatial sets characteristic of each social formation. Spatial practices ensure continuity and some degree of cohesion. In terms of social space, and of each member of a given society's relationship to that space, this cohesion implies a guaranteed level of competence and a specific level of performance. 2 Representations of space, which are tied to the relations of production and to the 'order' which those relations impose, and hence to knowledge, to signs, to codes, and to 'frontal' relations. 3 Representational spaces, embodying complex symbolisms, sometimes coded, sometimes not, linked to the clandestine or underground side of social life, as also to art (which may come eventually to be defined less as a code of space than as a code of representational spaces)" (Lefevbre, 1991, p. 33).

Spatial practices, that is, perceived space, reveal that space is a social production. Representations of space, that is, designed space, describe the space designed by professionals or technocrats who do not recognize the dominant spaces within society. Representational spaces, that is, lived spaces, define the space that includes the images and symbols of the space included in daily and counter-life. The three basic elements of the experience of space (perceived, designed, and experienced) and spatial conceptualizations (spatial practices, space representation, and representation space) form the basis of Lefebvre's space theory.

In summary, social space both gives birth to and exists with the whole of produced, productive, and consumed actions. This space, which is also an agent of production "contains potentialities… a body which by putting up in the sense of an initially utopian alternative to actually existing 'real' space)" (Lefevbre, 1991, p. 349). Lefebvre defended the idea of an inclusive, plural, conflictual, libertarian, equal, polyvalence, multiple, and open space that includes these potentials with his theory of differential space (which has a solution to contradictory space). "*Differential analysis brings out the variations, pluralities and multiplicities which introduce themselves into genetically senior dualities, as well as the disparities, disjunctions, imbalances, conflicts and contradictions that emerge from them"* (Lefevbre, 1991, p. 411).

To explain the theory of differential space, it is necessary to convey its contradictions of contradictory space. The late capitalist period is a more intense visible form of contradiction in the abstract space defined by the early capitalist period. Abstract space is now defined by contradictions rather than quantity and quality. Social relations and everyday life are experienced with new contradictions within the capitalist order. All of these factors affect the production of space. *"The contradictions of space thus make the contradictions of social relations operative. In other words, spatial contradictions 'express' conflicts between socio-political interests and forces; it is only in space that such conflicts come effectively into play, and in so doing they become contradictions of space"* (Lefevbre, 1991, p. 365). As the impact of contradictions increases, "t*he diversity of spatial forms and the flexibility of practice can only become more marked, along with the variety of functions, with multifunctionality - and indeed with dysfunctionality"* (Lefevbre, 1991, p. 388).

Lefebvre explains these contradictions by associating them with the concept trio of the production of space (social production), productive consumption of space (labour and daily, reproducing space), and consumption of space (non-daily actions). Afterwards, he expresses the methods of deciphering the space regarding contradictions and, in a sense, the approach propositions regarding that space. One of these *"distinguishes between types of oppositions and contrasts in space: isotopias, or analogous spaces; heterotopias, or mutually repellent spaces; and utopias, or spaces occupied by the symbolic and the imaginary - by 'idealities' such as nature, absolute knowledge or absolute power"* (Lefevbre, 1991, p. 366). Lefebvre's theory of differential space is a solution to the utopias mentioned regarding contradictory space.

Differential space, as a theory, shows the value it gives to the difference and experience by expanding the difference. *"This theory covers the whole realm of knowledge (connaissance) and of thinking about knowledge"* (Lefevbre, 1991, p. 371). According to the theory of production of differences, differences give rise to

differences again, and these differences are formally *"...opens of itself onto the unknown and the ill-understood: onto rhythms, onto circulations of energy, onto the life of the body (where repetitions and differences give rise to one another, harmonizing and disharmonizing in turn)"* (Lefevbre, 1991, p. 373). *"...a produced difference presupposes the shattering of a system; it is born of an explosion; it emerges from the chasm opened up when a closed universe ruptures"* (Lefevbre, 1991, p. 372). *"The 'right to difference' is a formal designation for something that may be achieved through practical action, through effective struggle - namely, concrete differences"* (Lefevbre, 1991, p. 396). Differential space is *"...in which each individual and/or collective 'subject' ... would become acquainted with use and enjoyment..."* (Lefevbre, 1991, p. 381).

"Spatial practice is neither determined by an existing system, be it urban or ecological, nor adapted to a system, be it economic or political. On the contrary, thanks to the potential energies of a variety of groups capable of diverting homogenized space to their own purposes, a theatricalized or dramatized space is liable to arise. Space is liable to be eroticized and restored to ambiguity, to the common birthplace of needs and desires, by means of music, by means of differential systems and valorizations which overwhelm the strict localization of needs and desires in spaces specialized either physiologically (sexuality) or socially (places set aside, supposedly, for pleasure)" (Lefevbre, 1991, p. 391).

David Harvey evaluates Lefebvre's book The Production of Space as *"an opening towards new possibilities of thought and action"* (Lefevbre, 1991, p. 431). At this point, we hear the word that associates the production of space and the theory of differential space, which we try to explain under this heading, with the concept of performativity. Under this heading, we encountered many concepts and ideas related to the definitions of performativity and its space. Beyond this, however, we also want to express the potential of performativity as an opening towards these new and alternative possibilities.

PERFORMATIVE PRODUCTION OF PERFORMATIVE SPACE

Before explaining how performativity is considered a concept that can both describe space and produce the same space, we define the concept and convey its conditions. Performativity has meaning beyond action/performance. Performativity creates a situation in which a new reality is produced; that is, it has transformative and productive power. This is an aesthetic event. What happens is not just the action/performance. Simultaneously, communication occurred. It has a touch of life. This has a political aspect. There are several common scenarios.

Looking at what kind of discussions the concept of the performative generates in various disciplines details the concept. Simultaneously, we encounter the performative conditions. These conditions provide guidance for readings related to the concept of performativity in the fields of architecture and urban design.

The concept of pragmatics is based on linguistic discussions. Wittgenstein creates awareness that language is a tool in social actions with the language games and family resemblance concepts he produces. Thus, Wittgenstein's second period works on (Investigations)-shaped speech act theory (communication theory). J.L. Austin became the founder of speech acts theory by developing it. He included the concept of performativity in linguistics. Austin bases the theory of speech acts with the idea that saying something means doing something. Concepts that emerge from the performative aspect of language and the conditions of this performative are used and developed as a basis in various disciplines, as attempted in this study. The unique relationship between the performative aspect of language and social and everyday life has a significant impact on this usage. The performativity of language as productive and creative requires the active and mutual interaction of the listener and the speaker while creating actions. It is constantly changing in terms of its historical, cultural, and social aspects. It can have different meanings depending on its context, that is, it is polysemous. They are pluralistic and diverse. Therefore, it must be reusable, that is, flexible and ambivalent.

To move forward from similar definitions, we would like to explain how the concept of act is handled specifically in the work of art. Umberto Eco's Open Work, published in 1962, has a strong influence in this

field. Eco explains how a work can be open and why it should be open, with examples from different branches of art. *"A work of art is a radically ambivalent declaration, a multiplicity of signifieds coexisting in a single signifier. To realize ambivalence as a value, contemporary artists have often resorted to the formlessness, disorder, coincidence, and indetermination of results. In this way, they wanted to determine the dialectic between form and opening that would determine the limits at which a work can sharpen its ambivalence and connect to the active intervention of the audience without causing the 'work' to lose its quality. Here, the word 'work' should be understood as follows: An object equipped with structural features that allow the succession of interpretations and the evolution of perspectives, but also regulate them."* (Eco, Açık Yapıt, 1992, s. 7, 8).

A special relationship between the artist and the receiver and the interpreter of the work of art is mentioned. This interaction enables the product to become a work of art.

"…The artist who makes the production knows that he is structuring a statement with his object: he does not ignore the fact that he is working for a buyer. He knows that this receiver will interpret the object statement by making use of all its ambiguities; however, he does not consider himself any less responsible for that communication chain. As a result, every poetic clearly reveals its communication project as an operational project from the very beginning: it is a project on an object and its effects. Every research on poetics must therefore take these two aspects into consideration; especially when it comes to open poetics of works, which are the project of a declaration equipped with a wide range of interpretation possibilities." (Eco, Açık Yapıt, 1992, s. 9).

Interpretation possibilities are not infinite for Umberto Eco; they are designed under the control of the creator. The interaction between the artist and interpreter in the context of the work of art is also considered production and consumption. The commentator's act of consumption is defined as the opening of the work. The concept of open work, the interaction between the work and the receiver, interpretation, etc. He presents his actions to us.

Open work is an act of creative improvisation. This facilitates the interpreter's conscious and original actions. Through his act, the commentator relives open work from a unique perspective. Therefore, open work is a field of possibilities that offers interpreters work to be defined. "…each opening develops the work but does not exhaust it; There are productions that complement each of the different openings. In short, the work that is presented in its entirety at each opening does not fail to be incomplete after each opening." (Eco, Açık Yapıt, 1992, s. 27).

Erika Fisher-Lichte bases the concept of performance as a performative aesthetic in the context of performing arts. She defines the conditions of performative aesthetics, that is, performativity, within the scope of theatre and the performance arts. We encounter an approach that disrupts the positions of the audience and the actor during a theatre and/or performance.

"They have created a new and unique reality for both the artist and the audience, that is, for everyone who participates in the performance. This reality was not only interpreted by the audience, but, above all, it was experienced with all its effects. …The important thing here was not to understand the performance, but rather to experience it and deal with experiences that cannot be overcome by thinking there." (Fischer-Lichte, 2016, s. 22, 23).

The experiences that are tried to evoke by the audience push the audience not only to be a feeling or thinking subject, but also to be an actor, that is, a performer. The experiences here create a new and unique reality; that is, they are performative. Instead of producing work, events are produced. The fact that production and reception occur simultaneously in the same place creates an event that includes all of them. The action is self- referential, that is, they also express the actions they perform.

These changing definitions and relationships between the audience and the actor require different ways of using or constructing a theatre space. This space is sometimes the result of an open production, that is, a performative production that can be interpreted repeatedly like an open work. Sometimes, they are coincidental places with concepts that contain the potential to enable performative action.

In Fisher-Lichte's work, in which she argues that culture is produced performatively, we encounter implications for the social and performative production of space. Performative actions have the power to be unexpected, coincidental, ambiguous, repetitive, temporary, redefining and representing, reevaluating, potential, and transformative. These inferences define performative spaces in architecture and urban design.

Another important term that produces works by associating the concept of performativity with society is Judith Butler. In addition to her contributions to social studies, she has expanded the implications of the concept of performativity. Butler argued that gender is a form of identity construction constructed through social norms and practices rather than biological reality. In other words, gender, as a social construction, is shaped by the norms, expectations, and roles imposed by society, rather than by the individual's behaviour and identity. Butler associated the concept of performativity with the production of gender in society. In gender studies, Butler argued that individuals' genders in society are constantly and repeatedly produced independently of themselves. The fact that gender is a performative production and that individuals constantly rebuild their identities (gender) through their actions provides a basis for individuals to oppose social norms. Gender can be changed by questioning, reproducing, and performing.

Just as performativity does not have a single definition and condition, architecture and urban design do not have a single definition and production but diversify. This study examines causality and how performativity offers many concepts and discourses. In light of these concepts and discourses, we can say that openness and situational production are inclusive features. In architecture, and therefore in urban design, the concept of openness in the context of performativity varies widely in theory and practice. To give some examples: Herman Hertzberger's concept of polyvalence, Bernard Tschumi's event cities, Cedric Price's Fun Palace, Aldo van Eyck's playgrounds, Jaap Bekama's and Piet Blom's performative designs of their open and social society thoughts, Giancarlo de Carlo's, and Jean Nouvel's designs that enable individuals' encounters and performative actions, and Le Corbusier's social roofs.

A Study on the Performative Production of Space: World Peace Park – Beşiktaş/Istanbul

World Peace Park, located in the *Türkali* District of *Beşiktaş* District of Istanbul, is an open public space that is strong in terms of its inclusiveness and use. Located in a residential area, the park contains many natural areas and designed spaces with different characteristics. This diversity in spaces strengthens the inclusiveness of the park. Usage of the park is quite high, although it is busier on the weekends. It is not uncommon for loyal users of the park to creatively transform its space through their actions. This shows that the park was highly embraced by some people. For all these reasons, World Peace Park is a very attractive open public space for examination within the scope of the performative production of public space.

Before going into details about the park, we would like to describe the process of the field study. Natural observations were made to obtain data on park use. Specifically, observations were made on weekends when the park was most frequently used to observe the diversified activities of users as much as possible. During the observations, examples of the use of space transformed by the user's performative actions were photographed and documented. Simultaneously, the design of the park was analysed on-site to determine its potential for the performative production of space. A comparison was made between the old design of the park and its updated design on a map received from the municipality. Data on the use of the old park was searched on the Internet. Likewise, activities that did not coincide with the period in which the study was conducted were searched online. The collected data were analysed in the context of performative actions and their spaces, and those deemed worth sharing were conveyed in the study. As a result of all these examinations, the potential of the park regarding performative actions and the production of space was discussed in relation to the park's features. Finally, suggestions for the park were made to increase and/or strengthen performative actions. Most of these suggestions were based on ideas formed during observation.

Figure 1. On the left is the current view of the World Peace Park in the city (by google earth pro); on the right is the site plan of the park coded by the author for this study.

The area examined in this study was converted into a park in 1987. In 1989, both the park and its surroundings were afforested. In 2000, it was reorganized and named the World Peace Park. Meanwhile, trees brought by consuls general, ambassadors, and representatives of 25 countries were planted in the park. The park, which has become old over time, and some parts of it have become inadequate and unusable, was renewed in 2020 and took its current form. Beşiktaş Mayor Rıza Akpolat, who opened the renewed park, expressed the features of the new park as follows at the opening ceremony:

"With our renovation works, we made our World Peace Park energy efficient; We used low-energy lighting and reduced water consumption by installing automatic irrigation installations. To ensure walking comfort, we used natural stones on hard surfaces and supported roads with ramps, making them usable by our disabled neighbours. In addition to all these, not forgetting our dear friends with whom we share life in Beşiktaş, we created a dog walking area and placed bird feeders, which is an important need in our district. We built a ceremony square in which the flags of 22 countries were represented in our district fly for peace. We planted 23 mature olive trees in our park, representing each country whose flag was hung. In addition, we changed the location of the statue of Şeref Bey, the founder of the football branch in Beşiktaş, and made it more visible" (CNNTÜRK, 2024).

There are 462 types of plants in this park, with an area of 14,200 m^2 (BeşiktaşBelediyesi, 2024). In the park, there are resting areas, walking routes, dog parks (area coded with 1), bird nests, a ceremonial square with the flags of 22 countries represented in the district (area coded with 2), children's parks (area coded with 3) and in the south of the park, on the upper level, there is *Beşiktaş Cemevi*, which is adjacent to the park. Apart from religious ceremonies, *Cemevi* strengthened the use of the park with its beverage and food sales unit and an open seating area integrated with the park.

Figure 2. On the left is the ceremonial square with the flags of 22 countries (from the author's archive), and on the right is the open seating area of Beşiktaş Cemevi integrated with the park (from the author's archive).

The mayor introduces the square opening to the main entrance of the park as a ceremonial square. This area truly deserves the definition of square. The fact that it is at a lower elevation than the park in general, and is surrounded by walking routes and seating areas, supports the use of the area as a square. However, this does not stop. This spatial design leads to a wide variety of uses of the area and its environment beyond what is programmed, that is, performative actions and its spaces produced by these actions. Occasionally, these actions are intertwined. As in the case of performativity, it occurs repeatedly and is inherently temporary. It is creative: it creates new realities and situations by using the potential of the constructed space (performative space). Apart from the various events organized by the municipality, the square also hosts many different activities organized by users, such as dance, yoga, and zumba.

The variety of walking routes and seating units surrounding the square reinforces the use and navigation of the square. The stair axis, which connects to the middle of the square and provides a connection between the upper level of the park and the square, enables various activities with the seating units arranged. Beyond the purpose of circulation, a staircase is a scene of encounters and meetings. This leads to different spending time on activities. Owing to its special location within the park, the staircase is both the one that watches the square and the one that is watched from the square. Seating units with different features placed around the perimeter of the square increases the time spent in the park and encourages diversified activities such as lying down, sunbathing, and reading.

Figure 3. On the left, the main staircase leading down to the square with different seating units (from the author's archive); on the right, the square, surrounding seating units, and the main staircase (from the author's archive).

The walking routes in the park provide internal circulation of the park while also allowing people in the region to enter the park from different elevations and routes. This involvement does not always begin with the aim of spending time in the park. However, the preferred route can turn into another action through chance encounters in the park. These routes in the park can become roads for sports purposes. Owing to the physical structure of the routes and the park, these roads can be ramps for children to slide on repeatedly.

Figure 4. The use of the walking route coded with B in the first image by the children with the act of sliding (performatively) and the performative production of the road as a skateboard track (from the author's archive)

While the performative temporary transformation of the park by performers (users) sometimes requires creative solutions, it sometimes occurs as it exists.

Figure 5. Examples of performative actions and its spaces produced (from the author's archive) (on the left, slackline - a balance sport based on walking on a tightrope, in the middle, the ideal area where reading and sunbathing can take place by moving the chair to another area, the chair and its user, on the right, the park's hard ground routes and use of bicycles and scooters, as permitted by the areas)

DISCUSSIONS AND SUGGESTIONS

The World Peace Park attracts attention in the city because of its location, natural physical features, and the potential offered by these features in the setting of the place. This leads to intense and varied performative use. As performers become attached to the place through their actions, they tend to own, protect, and develop the park. In the news, we encountered actions in this direction throughout the park's history. The park is also a scene of individual and social self-expression and self-construction: being in space, experiencing space with others, and temporarily producing space.

The park has the potential to be developed. Interpretations can be made of existing designs that will enable more open and diversified actions. For example, in the first image, the seating units located on the main staircase axis coded with C can be reproduced at the same level and made mobile, providing different scales for sitting and meeting. The same situation was observed for seating units around the square located at the main entrance of the park. In the same image, the structure defining the walking axis coded with A and the seating units fixed to it are rarely used. This may be natural in areas where the transition is dense and the trees are sparse. However, if the act of sitting and spending time is done in a group, it requires sitting opposite to each other for easier communication. To achieve this, movable seating units can be added to the sides of a road. Children's playgrounds can be designed with an open concept that allows children's experience and interaction, instead of solid designs such as the example we gave in the text through Aldo van Eyck. The potential of this park, which is intertwined with many types of natural and living creatures, can be evaluated. The transformations carried out within the scope of the Garden and Flower Festivals organized by the municipality can be given as examples. One of these is the temporary transformation of the vertical pools in the old state of the park into aquaponic pools by EK BİÇ YE İÇ using a soilless agriculture approach. Birge Yıldırım and Ozan Avcı designed the bird bowl-feed guide for birds, which was held in another year of the same festival and still exists today. However, this requires further maintenance.

"While 'Birdhouse' enriches the public space as a bird garden produced for birds, it heralds a new garden concept through the dialogue of urban residents with birds. Food guide for birds: Bread, Wheat, Barley, Oats, Corn, Millet, Rice, Lentils, Vetch, Vetch, Broad Beans, Peas, Beans, Rapeseed, Hemp, Flax, Sunflower Seeds, Safflower" (Arkitera, Arkitera, 2024).

Figure 6. On the left is the aquaponics pool (Arkitera, Arkitera, 2024), in the middle is a representation of birdhouse design (Arkitera, Arkitera, 2024), and on the right is the current birdhouse (from the author's archive).

With all these discussions and suggestions, hope for the potential of future public space structures in Turkey is alive. *"'Change life!' 'Change society!' These precepts mean nothing without the production of an appropriate space"* (Lefevbre, 1991, p. 59).

CONCLUSION

This study examined World Peace Park within the context of performative actions and produced space in the context of social production of space and differential space theory. As a result of the observed actions, we can say that World Peace Park is a good example of how public spaces are produced repeatedly through

social actions. Regarding the integrity of the physical features of the park and the actions of its users (performers), we can see that World Peace Park produces its practices in the context of differential space theory. While these actions, which originate from the inherent features of the theory, are performative actions, they also produce space. The results obtained show that World Peace Park has a high potential for performative actions but has some deficiencies in the design concept that will encourage these actions.

Observations made in the park and research conducted on the Internet show that the inclusiveness of the existing design of the park is strong. The park is embraced and defended by users. There are no obstacles for individuals and groups to be included in the space, or to express and construct themselves. Interactions in the park have the potential to strengthen social relationships between individuals and increase urban solidarity.

We hope that the results obtained in this study will contribute to thoughts and productions regarding public spaces.

REFERENCES

Arkitera. (2024, 5 8). *Arkitera*. Retrieved from 9 Tasarım Ekibinin Yerleştirmeleri Beşiktaş Çiçek Festivali'nde:

https://www.arkitera.com/haber/9-tasarim-ekibinin-yerlestirmeleri-besiktas-cicek-festivalinde/ Arkitera. (2024, 5 8). *Arkitera*. Retrieved from Süs Havuzundan "Akuaponik" Bahçeye Dönüşüm:

https://www.arkitera.com/haber/sus-havuzundan-akuaponik-bahceye-donusum/

Austin, J. L. (2020). *Söylemek ve Yapmak: Harvard Üniversitesi 1955 William James Dersleri.* İstanbul: Metis. BeşiktaşBelediyesi. (2024, 5 8). *Beşiktaş TV youtube kanalı*. Retrieved from Beşiktaş TV:

https://www.youtube.com/watch?v=BUDxSyITMMk

Butler, J. (2020). *Cinsiyet Belası: Feminizm ve Kimliğin Altüst Edilmesi.* İstanbul: Metis Yayınları.

Certeau, M. D. (1984). *The Practice of Everyday Life.* California: University of California Press.

CNNTÜRK. (2024, 5 8). *CNNTÜRK*. Retrieved from Beşiktaş'ta Yenilenen 'Dünya Barış Parkı' açıldı: https://www.cnnturk.com/yerel-haberler/istanbul/merkez/besiktasta-yenilenen-dunya-baris-parki- acildi-1561782

Eco, U. (1992). *Açık Yapıt.* İstanbul: Kabalcı Yayınevi.

Fischer-Lichte, E. (2016). *Performatif Estetik.* istanbul: Ayrıntı Yayınları.

Harvey, D. (2011). *Umut Mekanları.* İstanbul: Metis Yayınları.

Hertzberger, H. (1991). *Lessons for Students in Architecture.* Rotterdam: 010 Publishers.

Hertzberger, H. (2000). *Space and the Architect: Lessons in Architecture 2.* Rotterdam: 010 Publishers. Lefebvre, H. (2013). *Modern Dünyada Gündelik Hayat.* İstanbul: Metis Yayınları.

Lefebvre, H. (2018). *Şehir Hakkı.* İstanbul: Sel Yayıncılık.

Lefevbre, H. (1991). *The Production of Space.* Oxford: Basil Blackwell.

Özcan, Z. (2018). *Dil Felsefesi III: İkinci Wittgenstein'da Gramer Paradigması.* Bursa: Sentez Yayıncılık. Özkan, Z. (2020). *Dil Felsefesi IV: Austin'de Eylemsel Paradigma.* Bursa: Sentez Yayıncılık.

Wittgenstein, L. (2006). *Felsefi Soruşturmalar.* İstanbul: Totem Yayıncılık.Wolfrum, S., Brandis, N. F. (eds.). (2015). *Performative Urbanism: Generating and Designing Urban Space.*

Berlin: jovis.

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CITY PLANNING AND URBAN DESIGN STUDIES

HOW HIGH-RISE BUILDING FACADES COMMUNICATE IN THE URBAN LANDSCAPE: A CASE STUDY OF TORONTO

MUNTASYIR AL WAFI, SINEM KULTUR

Muntasyir Al Wafi, Graduate Student, Department of Architecture, Bahcesehir University

Sinem Kultur, Assistant Professor, Faculty of Architecture and Design, Bahcesehir University

ABSTRACT

Facades, the outer skins of buildings, play an essential role in shaping the urban landscape. As the major exposed building surfaces, facades communicate with their surroundings in several ways, e.g., physically with the city's streets, visually as part of the city silhouette, or through symbolic meanings. They mostly reflect the style, history, and function of their buildings. Facades are in a close physical relationship with their surroundings on the lower floors; however, they transform into landmarks or dominant elements in city silhouettes as they ascend, revealing a unique and intriguing relationship with their context. For this reason, today, in most contemporary cities, high-rise building facades are significant contributors to city images. This study aims to understand the dynamic interplay between architecture and urbanism, particularly how high-rise building facades articulate the evolving identity of cities.

The paper focuses on the high-rise buildings of Toronto to showcase their communicative role in the urban landscape. By employing a qualitative approach that includes a literature review, architectural critiques, visual analysis, and case studies of notable buildings in downtown Toronto, the paper investigates the evolution of Toronto's high-rise facades, from the early 20th century's brick and stone structures to the modern era's glass and steel giants, reflecting societal changes, cultural diversity, technological advancements, environmental awareness, etc. The goal is to understand their impact on Toronto's city identity and their perception by its residents and visitors.

The paper reveals that the high-rise building facades contribute to Toronto's narrative of growth, ambition, and response to environmental challenges through their design, materials, and innovations. The features of these facades show Toronto's evolution and drive for modernity, while the materials used speak to a commitment to sustainability, employing eco-friendly and energy-efficient solutions. Innovations in facade technology further highlight the city's role as a leader in addressing climate change. The results aim to link facade designs with the urban identity.

In conclusion, high-rise building facades emerge as a significant influence on Toronto's urban landscape, mirroring the city's historical progression, cultural values, and sustainability goals. Future research may include interviews with residents and visitors to learn their understanding of the 'building facades' messages'.

Keywords: High-Rise Facades, Urban Landscape, Facades Evolution, Toronto.

INTRODUCTION

High-rise buildings play a significant role in modern architectural design and urban development (Szolomicki & Golasz-Szolomicka, 2019). Also known as "Tall Buildings" or "Tower Blocks", a multi-level structure (Challinger, 2008), where consists of main components such as foundation, structure, facade, architectural works and finishes, elevators/lifts, and building services (Poulos, 2017). While there may be slight differences in how the definition used, generally in line with other researchers and government building codes (Hall, 2000). Globally, high-rise building often starts at about seven stories or 23 to 30 meters (Craighead, 2008). In Ontario, Canada, the Ontario Building Code specifically defines them as either seven stories or higher, or with the top floor being over 18 meters above ground. Facades, as the outer skins of buildings, have an influence that extends beyond their physical boundaries within the structure; they also affect the surrounding space. Being a prominent feature viewed from the exterior, facades play a crucial role in shaping both the building's interior and its immediate surroundings (Knaack et al., 2014). Building facades communicate with their surroundings (Huxtable, 2004), offer diverse experiences to the viewers (Hossein Askari, 2014). The urban landscape, however, is the physical manifestation of a city's development, encompassing its buildings, public spaces, and the overall arrangement of its urban environment and the city's image (Cullen, 1961; Chen, 2021). Within this landscape, high-rise facades acting not just as the physical boundary of a building but also as a key element in urban design and architecture (Moor & Erysheva, 2018). These facades are more than mere aesthetic features; they shape the character of urban areas, influencing how people interact with and perceive their environment (Dalsgaard & Halskov, 2010).

A building facade serves as a defining attribute of urban environments and city images (Moughtin et al, 1995), offering visual impressions of the city (Hossein Askari, 2014). The architecture of high-rise facades reflects both functional and symbolic aspects. Functionally, facades contribute to the sustainability and efficiency of buildings, impacting factors like light, temperature, and energy usage (Aksamija, 2018). Symbolically, facades can express cultural values, historical contexts, and artistic visions, thereby playing a crucial role in the identity of a city (Alishah et al., 2016). In the realm of urban design, building facade stands out as one of the most influential elements shaping the urban landscape and city image (Hui, 2007). They dictate not only the visual appeal of city landscape but also affect urban dynamics such as pedestrian flow, public gathering spaces, and the overall sense of place (Gehl et al., 2006).

The city of Toronto urban landscape, a vibrant and dynamic metropolis. Known for its diverse cultural fabric and rapid urban growth, Toronto city’s landscape has undergone a dramatic transformation over the past few decades (Replh, 2013). This paper aims to delve into the complex interplay between high-rise facades and the urban landscape in Toronto as a case study. The research questions for this study are, what role do high-rise facades in Toronto's urban landscape play in communicating narratives of innovation, ambition, culture, and change? and how do these facades engage in a dynamic dialogue with their residents and the world? The structure of the paper begins with a historical overview of Toronto's urban growth and the evolution of its high-rise architecture. It will then explore the incorporation of cultural and historical elements in facade designs and technology, examining specific building examples within the city. The paper will conclude with a reflection on the future of urban design in the context of evolving societal and environmental needs.

In this paper, a review of existing scholarly articles, architectural critiques, and historical characteristics of several buildings was conducted. The criteria for selecting particular high-rise buildings as case studies involve several key factors: architectural significance, historical and cultural impact, diversity in usage and function, and geographical distribution across downtown Toronto. In addition, data on various attributes of the selected buildings, such as height, construction year, material used, facade technology and function were gathered and analyzed for the purpose of making comparisons, categorizations, and trend analyses.

TORONTO'S HIGH-RISE FACADES FROM A HISTORICAL PERSPECTIVE

Over the past century, high-rise facades in Toronto have transitioned through various styles and materials design, reflecting changing architectural trends, technology evolution, and societal development. Beginning at Toronto's first skyscraper, the Trader's Bank Building that was completed in 1906, a 55.39-meter-high office building's Neo-Classical design is typical of the early skyscraper era (Landau, 2020). In the early 1900s, the architectural landscape was heavily influenced by European styles. High-rise building facades from this period, predominantly in Beaux-Arts and Edwardian styles, were characterized by their ornate detailing, robust masonry, and use of local materials like brick and stone (Crossman, 2005; Winterton, 2015). The Old City Hall and the Royal York Hotel are quintessential examples, displaying intricate stonework and elaborate decorative elements. These facade features were not just about aesthetics; they symbolized stability and permanence in a rapidly modernizing city. In 1920, the introduction of the Art Deco style in Toronto's architecture, facades were sleeker and more streamlined compared to their predecessors, featuring geometric patterns, vertical emphasis, and a blend of traditional materials with new ones like terracotta and glazed tiles (Myzelev, 2010). Buildings like the Commerce Court North exhibited this transition, representing a move towards modernity and a departure from heavily ornamented exteriors.

Following World War II, Toronto witnessed a significant change towards Modernism in architecture. This movement brought about a transformation in facade design, moving away from decorative elements to embrace sleek, minimalism and functionality (Flaman, 2013). The use of glass, steel, and concrete became prevalent. The Toronto-Dominion Centre, a classic example, showed a minimalist facade with large glass panels and a simple, yet elegant, steel frame. This shift was not just aesthetic but also practical, as these materials allowed for faster construction and more efficient use of space. The late 20th century saw a resurgence of interest in historical elements, leading to the era of Postmodernism. This period was marked by eclectic facades that combined traditional and modern elements (Harris & Dostrovsky, 2008). The facades of Scotia Plaza and Brookfield Place illustrate this trend, where architects melded historic styles with contemporary materials, creating visually striking and unique exteriors. The new millennium has brought a heightened focus on sustainability and environmental responsibility for typical green building in facade design (Ali & Armstrong, 2008). Contemporary high-rise buildings in Toronto, like the Telus Tower and the RBC Centre, feature facades designed for energy efficiency and environmental sustainability. These buildings often use high-performance glazing, green walls, and other eco-friendly materials, reflecting a commitment to reducing the environmental impact of urban development. Today, in Toronto as other cities in the world, high-rise facades are increasingly incorporating smart technologies and innovative design solutions. Buildings are being designed with facades that can adapt to environmental conditions, optimize energy usage, and enhance the comfort of occupants (Le, 2022). The use of metal and dynamic glass, photovoltaic panels, and interactive elements is becoming more common (Bruno & Frighi, 2023), pointing towards a future where building exteriors are not just static shells but dynamic components of the urban ecosystem. Frank Gehry's latest project, Forma Tower (under construction) in Toronto features twin skyscrapers distinguished by their boxy structure and a facade of textured metal and glass. The following table shows the summary of architectural and facades evolution from the early 20th century to the current time (Table 1):

Table 1 Summary of architectural and facades evolution from the early 20th century to the current time

Period	**Styles**	**Facade materials**	**Building example**	**Building details** (building height, facade cladding materials, year built, function)
Early 1900s	Influenced by European styles like	Ornate detailing, robust masonry, and	Trader's Bank Building	55.39 meters, 15 floors, Stone-brick-terra cotta with limestone casings,

	Beaux-Arts and Edwardian styles	use of local materials like brick and stone (Crossman, 2005; Winterton, 2015).		1906, Originally a bank - now office space.
			The Old City Hall	103.6 meters (clock tower), Not specified, Sandstone – yellow and orange, 1889-1899, Originally city hall, now a courthouse.
			The Royal York Hotel	124 meters, 28 floors, Indiana Limestone, 1929, Hotel.
Art Deco in 1920	Facades were sleeker and more streamlined compared to their predecessors	Using geometric patterns, vertical emphasis, and a blend of traditional materials with new ones like terracotta and glazed tiles (Myzelev, 2010).	Commerce Court North	145 meters, 34 floors, Limestone, 1931, Office building.
Post-War Modernism	From decorative elements to embrace sleek, minimalism and functionality (Flaman, 2013).	The use of glass, steel, and concrete. More building facade with large glass panels and a simple, yet elegant, steel frame.	Toronto Dominion Centre	222.8 meters, 56 floors (main tower), Black-painted steel frames and bronze-tinted glass curtain walls, 1967, Business and office complex.
Modernism to Post-Modernism	Eclectic facades that combined traditional and modern elements (Harris & Dostrovsky, 2008).	Melded historic styles with contemporary materials	Scotia Plaza	275 meters, 68 floors, Napoleon Red granite, 1988, Commercial office space.
			Brookfield Place	261 meters, 53 floors, Glass and steel, 1992, Commercial office space and retail.
The New Millennium	Focus on sustainability and environmental responsibility for typical green building in facade design (Ali & Armstrong, 2008).	Use high-performance glazing, green walls, and other eco-friendly materials	Telus Tower	112 meters, 30 floors, Glass and steel, 2009, Commercial office space.
			The RBC Centre	185 meters, 43 floors, Glass and metal, 2009, Commercial office space.
Today	Incorporating smart technologies and innovative design solutions	The use of dynamic metal and glass, photovoltaic panels, and interactive elements (Bruno & Frighi, 2023)	Forma Tower	298 meters and 262 meters, 84 and 73 floors, Metal and glass, Under construction, Mixed-use

DISCUSSION

Facades technology and design progress and change over time to effectively respond to the complex challenges presented by contemporary construction and environmental concerns. The high-rise facades in Toronto serve as more than just protective shells for the buildings they envelop; they communicate a variety of messages and serve multiple functions within the urban landscape. This discussion explores how high-rise facades represent innovation and ambition, symbolize global communication, interaction with their environment, and their evolution in technology and sustainability.

HIGH-RISE FACADE AS NARRATIVES OF INNOVATION AND AMBITION

Many high-rises in Toronto are constructed and used for functional structures but also represent its innovation and ambition narratives. Contemporary buildings, with their progressive designs and use of advanced materials and technologies, describe Toronto's position as a forward-thinking metropolis. For example, buildings in the Financial District embody the city's economic aspirations and growth, while those in the areas like the Old Toronto as one of historical district reflect a blend of historical preservation and modern urban living.

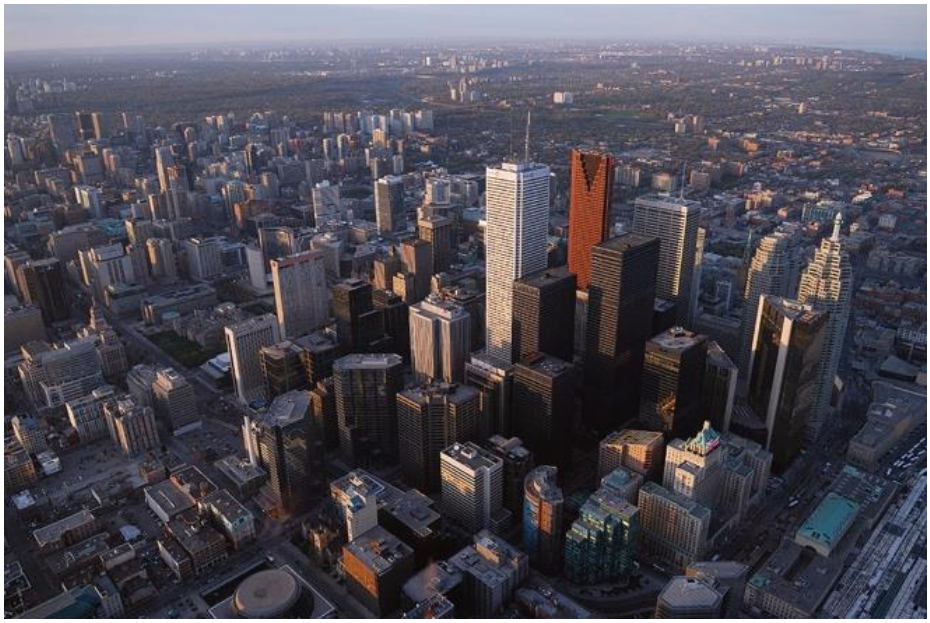

Figure 1. The aerial view of the Toronto financial district from the CN Tower, captured in 2016, credit by: Reimar Gaertner.

In the Financial District (Figure 1), the towering high-rises are more than just centers of commerce and business. Their imposing glass and steel structures, soaring into the skyline, are symbols of Toronto's economic aspirations and growth (Berman, 2015). These buildings, with their sleek, modern designs, reflect the city's ambition and its status as a global financial hub. On the other hand, while these high-rises imposed the economic growth of Toronto, historical buildings in the Old Toronto district presents a different narrative through its high-rises. Here, the architectural language shifts to a dialogue between the past and the present.

Buildings in this area often display a dedicated blend of historical preservation and contemporary urban living. For instance, the integration of heritage facades such as the Commerce Court building (Figure 2) with a height of 145 meters and 34 floors, used limestone and stone sculpture as facade cladding, built in 1931, serves as an office building, into new constructions serves as a physical reminder of the city's history, a respect for its architectural past interwoven with the demands of modern city life. Commerce Court building shows us the use of traditional materials, the preservation of iconic motifs, and the replication of historical architectural styles in newer buildings create a sense of continuity, bridging the gap between different periods of the city's development.

Figure 2 Commerce Court is a financial and architectural hub of historic and modern in the downtown Toronto, credit by: K.I.B. Restoration Gallery

HIGH-RISE FACADE SYMBOL AS A GLOBAL COMMUNICATION

The materials, designs, and motifs employed in these towering structures often carry a symbolic weight, narrating stories beyond their physical presence. For instance, the use of glass in many contemporary high-rises. This material choice is not only for aesthetic appeal or practicality. Glass facades symbolize transparency and openness (Elkadi, 2016), reflecting Toronto's democratic ideology and multicultural ethos. They allow light to permeate, creating spaces that feel open and inclusive, mirroring the city's embrace of diverse cultures and communities (Elkadi, 2016). The preservation of brick and stone elements in newer buildings pays attribute to Toronto's rich industrial past. The contrast of old and new materials in a single building can be seen as a narrative of transformation, symbolizing Toronto's journey from a major industrial player to a contemporary urban center.

Figure 3 CN Tower (the tallest) among other high-rise buildings, credit by: Istvan Kadar Photography

The iconic structure of CN Tower (Figure 3) for example. Completed in 1975, with 553 meters height above the cityscape, it transcends its functional role as a broadcasting and observation tower to become a symbol of Toronto itself. The use of Concrete, metal, and glass as facade cladding materials along with the building height and distinctive structure make it a beacon of modernity, it would retain its status as the tallest freestanding structure globally until it was surpassed by Dubai's Burj Khalifa in 2009. The CN Tower's lighting, which often changes to mark significant events or causes, adds another layer to its symbolism. Moreover, the tower had a transformative impact on Toronto and has served another critical function in the life of the city.

Another example is the Toronto City Hall and its square (Figure 4), which were built in 1965. They feature concrete and glass as their facade cladding materials and serve as the municipal government headquarters of Toronto. This active space, located in the heart of the city, attracts over 1.8 million visitors annually from a variety of communities while hosts numerous special events in the building's square.

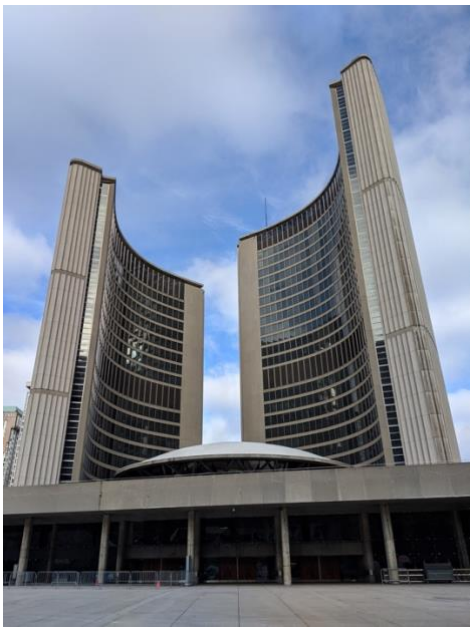

Figure 4 A low angle view of Toronto City Hall from the southern facade, credit by: Sikander Iqbal

HIGH-RISE FACADE INTERACTION IN THE URBAN ENVIRONMENT

As Toronto currently experiencing the second generation of significant high-rise development, where the first one occurred between 1960 and 1975 (City of Toronto, 2014). The newer high-rises often incorporate design elements that either complement or thoughtfully contrast with older buildings nearby. This careful consideration maintains a sense of architectural continuity and diversity, allowing different eras and styles to coexist and enhance the city's architectural narrative. The design of high-rises significantly influences the streetscape – the visual and functional experience of the street level (Al-Kodmany, 2013). Architects and urban planners consider how the base of these buildings interacts with the street. Elements like the building's setback, the presence of retail spaces, and the design of entrances and lobbies are all crucial in determining how these structures blend into or stand out in the streetscape. The aim is often to create a pedestrian-friendly environment that invites engagement and fosters a sense of community (Ewing et al., 2016).

High-rises play a pivotal role in defining Toronto's landscape, a visual representation of the city's identity. The current development for high-rise building according to the Tall Building Design Guidelines for the City of Toronto, focus on ensuring that high-rise buildings integrate well into their urban environment. For instance, the newest high-rise project The Forma Tower, a twin residential tower which are expected to play an important role on the skyline, was based on the preservation of heritage and the provision of adequate separation distances, sufficient light, and privacy.

HIGH-RISE FACADE EVOLUTION IN TECHNOLOGICAL AND SUSTAINABILITY

Architects are increasingly integrating climatic considerations into urban development, influencing the design of building (Romano et al., 2018). The evolution of high-rise facades in terms of technology and sustainability reflects a growing emphasis on energy efficiency, changing condition, and responsive design (Karakoc & Cagdas, 2021). According to Fernando et al., 2023, facade designers mentioned the challenges to identify new technology and while consider various factors like energy efficiency, cost, occupant comfort, and environmental impacts. Sustainable building design enable high structural and sustainable performance while producing a good aesthetic. In the recent year, new high-rise buildings in Toronto are designed to reduce energy consumption and carbon emissions, integrating green spaces, efficient waste management systems, and advanced structural materials. The commitment to sustainable urban development is reflected in its modern landscape, Toronto has some of the most ambitious environmental goals in North America, with a target of becoming net-zero by 2040 (Mirabelli, 2023). The goal of achieving this target should be supported by all Toronto residents and building developers, not just policymakers, to contribute effectively to combating climate change. Reducing greenhouse gas emissions through sustainable facades directly benefits the future of the city.

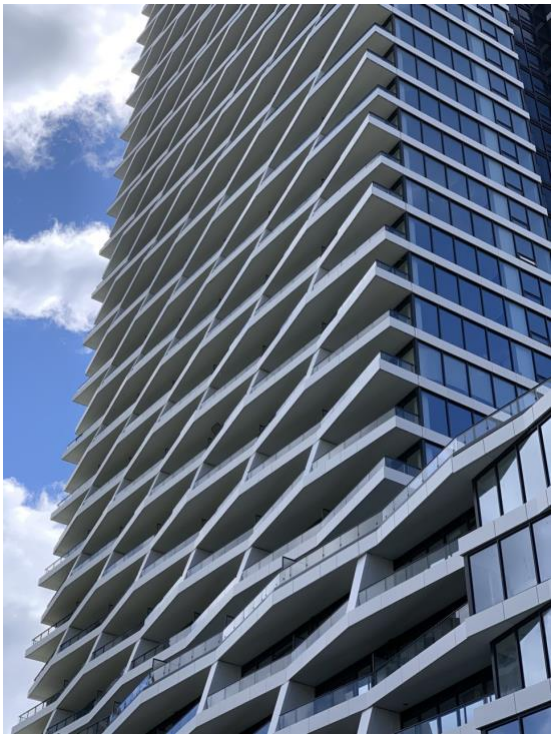

Figure 5. 411 Church Street, Stanley Condos, credit by: forum contributor Benito

In Toronto's 21st-century architecture, glass has dominated and continues to play an important role in the design of many building typologies. It is evident in the prevalent use of window walls and curtain walls. These claddings maximize natural sunlight and offer expansive views, enhancing the experience for occupants. This approach reflects Toronto's modern architectural trends, prioritizing bright, open, and fresh spaces within its urban landscape. Recently, Toronto's architectural trend is shifting from the uniformity of all-glass-and-spandrel finishes towards a more diverse mix of materials. This change is influenced by sustainability initiatives aiming to reduce the ratio of windows to solid walls. Architects are innovating with balcony designs to add visual interest while improving ventilation and reducing cooling energy by providing shading (Karimimoshaver, 2023). Residential Developments like Massey Tower, One Bloor East, 411 Church Street, Stanley Condo, and Harbour Plaza Residences (Figure 4) shows unique balcony shapes and patterns and the use of glass facade cladding as primary material to the design. These design elements impart a distinct aesthetic to each building, creating a break from the typical glass rectangle look while maintaining the use of conventional window walls. This approach offers an alternative to mixing materials, emphasizing unique structural designs. Another example is the 95 Wellington Street building in Toronto, focusing on the facade's revitalization with a new Bethel White granite cladding system. By using Bethel White granite as the facade cladding material, the building benefits from the material's durability, sustainability, and functional properties. The material provides excellent insulation, weather resistance, and structural integrity, ensuring the building's long-term performance and reducing maintenance needs. The upgrade, undertaken with sustainability in mind, involved meticulous planning and execution, preserving the building's original architectural vision while presenting a fresh, contemporary facade.

Figure 6. Revitalized 95 Wellington Street building with a ventilated facade having Bethel White Granite cladding, credit by: Steve Schrenk.

Moreover, Toronto has been encouraging using cross-laminated timber (CLT) for high-rise building construction (Azarbayjani & Thaddeus, 202). This material is increasingly preferred for its carbon-neutral properties and as an alternative to traditional building materials like steel and concrete (Poirier et al., 2016). The city's move towards timber framing in high-rise buildings reflects its commitment to sustainable and innovative architectural practices.

CONCLUSION

Given the significance of high-rise facades in the urban landscape, it has been regarded not only as the face but also form the urban identity. They mirror cultural values and historical elements, and their impact to the image of the city. Facade cladding materials not just show the outside of the building, but communicate to the urban environment – for instance, use of glass in high-rises symbolizes transparency and openness, and the blend of old and new materials narrates a story of transformation. Facade materials as well as their interaction with urban environment contributed to Toronto's identity tied to its economic growth, cultural diversity, and architectural innovation. In addition, as the city works to reduce its environmental impact, facade designs in Toronto are transitioning towards more sustainable and energy-efficient architecture.

Many buildings reflected the users and activity inside the building through the medium of facade design. The role of cladding material plays a pivotal role for the building identity while taking into consideration the functional performance of the facade. In addition, the highlighted importance of facade in urban storytelling and identity formation, suggests the future of urban development should be mindful of architecture's communicative power, particularly in rapidly developing landscapes like Toronto.

The paper's limitation lies in its reliance on existing literature and case studies, potentially limiting the breadth of perspectives or the incorporation of the latest architectural innovations. Future research could explore comparative analyses of high-rise facade across various global cities, investigate the role of new technologies such as mass timber in facade design, analyze the socio-cultural effects on local communities, and delve into the environmental sustainability of these structures. This direction will broaden the

understanding of urban architecture's role in diverse contexts and its implications on society and the environment.

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REFERENCES

Aksamija, A. (2016). Design Methods for Sustainable, High-Performance Building Facade. Advances in Building Energy Research, 10(2), 240-262.

Ali, M. M., & Armstrong, P. J. (2008). Overview of Sustainable Design Factors in High-Rise Buildings. In Proc. of the CTBUH 8th World Congress (pp. 3-5). Chicago, IL, USA: CTBUH.

Alishah, M., Ebrahimi, A., & Ghaffari, F. (2016). The Role of Buildings Facade on Urban Landscape (Case Study: Old context of sari).

Al-Kodmany, K. (2013). Placemaking in the High-Rise City: Architectural and Urban Design Analyses. International Journal of High-Rise Buildings, 2(2), 153-169.

Azarbayjani, M., & Thaddeus, D. J. (2022). One Floor at a Time: Cross-Laminating a Sustainable Future for Mass Timber in North America. The Importance of Wood and Timber in Sustainable Buildings, 225-283.

Berman, D. (2015) 'Toronto's Role as Canada's Financial Hub Continues to Expand: Report', The Globe and Mail. Available at: https://www.theglobeandmail.com/report-on-business/economy/jobs/torontos-role-as-canadas-financial-hub-continues-to-grow-report/article27501809/ (Accessed: 22 November 2023).

Brunoro, S., & Frighi, V. (2023). Smart Facades: Technological Innovations in Dynamic and Advanced Glazed Building Skins for Energy Saving.

Challinger, D. (2008). From the Ground Up: Security for Tall Buildings CRISP Report. Alexandria, VA: ASIS Foundation Research Council; SIS FO.

Chen, S. (2021). The Importance of Urban Landscape Design in Urban Planning. Journal of Sociology and Ethnology, 3(5), 144-148.

City of Toronto. (2014). City of Toronto Condominium Consultation Recommendations Report. https://www.toronto.ca/wp-content/uploads/2017/10/97a0City_of_Toronto_Condominium_Conslt_Jan2014.pdf

Craighead, G. (2009). High-Rise Building Definition, Development, and Use. High-Rise Security and Fire Life Safety, 3rd ed.; Butterworth-Heinemann: Boston, MA, USA.

Crossman, K. (2006) Architectural History: 1914-1967. The Canadian Encylopedia. Available at: https://www.thecanadianencyclopedia.ca/en/article/architectural-history-1914-1967 (Accessed: 21 November 2023).

Dalsgaard, P., & Halskov, K. (2010). Designing Urban Media Facades: Cases and Challenges. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (pp. 2277-2286).

Elkadi, H. (2016). Cultures of Glass Architecture. Routledge.

Ewing, R., Hajrasouliha, A., Neckerman, K. M., Purciel-Hill, M., & Greene, W. (2016). Streetscape Features related to Pedestrian Activity. *Journal of Planning Education and Research*, *36*(1), 5-1.

Fernando, D., Navaratnam, S., Rajeev, P., & Sanjayan, J. (2023). Study of Technological Advancement and Challenges of Facade System for Sustainable Building: Current Design Practice. Sustainability, 15(19), 14319.

Flaman, B. (2013). Modern or not Modern, Canadian architecture in the 1950s. The Journal of the Society for the Study of Architecture in Canada.

Gehl, J., Kaefer, L. J., & Reigstad, S. (2006). Close Encounters with Buildings. Urban Design International, 11, 29-47.

Hall, J. R. (2000). High-Rise Building Fires. The Association.

Harris, R., & Dostrovsky, N. (2008). The Suburban Culture of Building and the Reassuring Revival of Historicist Architecture since 1970. Home Cultures, 5(2), 167-196.

Hossein Askari, A., Dola, K. B., & Soltani, S. (2014). An Evaluation of the Elements and Characteristics of Historical Building Facades in the Context of Malaysia. Urban Design International, 19, 113-124.

Hui, C. V. (2007). Evaluation of the Facade of Building in the 'Type 1 Residential Area'of the 7th Land Consideration District in Taichung City. Unpublished Master Thesis, University of Science and Technology of China, China.

Huxtable, A. L. (2004). Building Facade. Journal of Design and Built Environment.

Karakoc, E., & Çagdas, G. (2021). Adaptive Architecture based on Environmental Performance: An Advanced Intelligent Facade (AIF) module. *Gazi University Journal of Science*, *34*(3), 630-650.

Karimimoshaver, M., Sadathosseini, M., Aram, F., Ahmadi, J., & Mosavi, A. (2023). The Effect of Geometry and Location of Balconies on Single-sided Natural Ventilation in High-Rise Buildings. Energy Reports, 10, 2174-2193.

Knaack, U., Klein, T., Bilow, M., & Auer, T. (2014). Facades: Principles of Construction. Birkhäuser.

Landau, J. (2020) Going up! Toronto's Tallest Building of Every Decade since 1900 | Urban Toronto. Available at: https://urbantoronto.ca/news/2020/04/going-torontos-tallest-building-every-decade-1900.41758 (Accessed: 21 November 2023).

Le, D. M., Park, D. Y., Baek, J., Karunyasopon, P., & Chang, S. (2022). Multi-criteria Decision Making for Adaptive Facade Optimal Design in Varied Climates: Energy, Daylight, Occupants' Comfort, and Outdoor View Analysis. Building and Environment, 223, 109479.

Mirabelli, J. (2023). 20 years: The Evolution of Toronto's Architecture. https://urbantoronto.ca/news/2023/10/20-years-evolution-torontos-architecture.53935

Moor, V. K., & Erysheva, E. A. (2018). High-Rise Buildings in the Structure of an Urbanized Landscape and their Influence on the Spatial Composition and Image of the City. In E3S Web of Conferences (Vol. 33, p. 01011). EDP Sciences.

Moughtin, C., Oc, T. and Tiesdell, S. (1995) Urban Design: Ornament and Decoration. Great Britain, UK: Butterworth Architecture Press.

Myzelev, A. (2010). Canadian Architecture and Nationalism: From Vernacular to Deco. *The Brock Review*, *11*(1), 28-42.

Poirier, E. A., Moudgil, M., Fallahi, A., Staub-French, S., & Tannert, T. (2016). Design and Construction of a 53-meter-tall Timber Building at the University of British Columbia.

Poulos, H. G. (2017). Tall Building Foundation Design. CRC Press.

Relph, E. (2013). Toronto: Transformations in a City and its Region. University of Pennsylvania Press.

Romano, R., Aelenei, L., Aelenei, D., & Mazzucchelli, E. S. (2018). What is an Adaptive Facade? Analysis of Recent Terms and Definitions from an International Perspective. Journal of Facade Design and Engineering, 6(3), 65-76.

Szolomicki, J., & Golasz-Szolomicka, H. (2019). Technological Advances and Trends in Modern High-Rise Buildings. Buildings, 9(9), 193.

Winterton, D. E. (2015). Toronto's Edwardian Skyscraper Row. Journal of the Society for the Study of Architecture in Canada.

SETTLEMENTS IN TRANSITION – THE RURAL URBAN CONUNDRUM IN INDIA'S URBANISATION

ANURIMA MUKHERJEE BASU, ASSOCIATE PROFESSOR, FACULTY OF MANAGEMENT SCIENCES, ADANI UNIVERSITY, AHMEDABAD, INDIA

ABSTRACT

Current urbanization trends in India show a sizeable increase in the number of 'census towns' – these are settlements that are in transition from rural to urban. While they have acquired all characteristics of urban settlements; they are not statutorily declared as urban areas. Research studies points to the unplanned and unregulated growth of census towns due to the lack of development controls and regulations; which are enforced in urban areas. Census towns located in the periphery of big urban centres, experience unregulated growth of real estate. In the absence of a statutory spatial plan and framework for protection and conservation of natural resources, they are subject to exploitation and degradation. This paper reviews the emergence of census towns in India and the corresponding challenges of governing these settlements. Case studies from different states are reviewed to analyse the impact of urbanization on these settlements. The paper highlights the need to ensure proper planning of census towns to be able to harness their potential.

INTRODUCTION

India's urbanization rate according to the last census of 2011 is 31%, which is moderate compared to its Asian counterparts. The Census of 2021 is delayed; but alternate estimates have stated current urbanization rate to be more than 40-45% depending on the methodology used for calculation (Jana 2016). Census 2011 is one of the defining moments of India's urbanization; for the first time, the absolute growth in urban population (91 million) is more than its rural counterpart (90.5 million) and there is a significant increase in the number of 'census towns', which are settlements that have acquired urban character (Pradhan 2013). Between Census 2001 and 2011, the number of urban settlements in the country has increased by 2772, registering a growth of 54% over the previous decade. A significant feature of this growth is the emergence of 2532 Census Towns, which accounts for 90% of the new urban settlements. However the new census towns accounts for 29.5% of increase in urban population in the decade. In terms of numbers of settlements, their increase is very high as compared to its share in urban population. Many researchers have stated this as 'sudden' 'phenomenal' and 'unprecedented' (Kundu 2011, Pradhan 2013). This urbanization trend has triggered much debate over the pattern and reasons for emergence of such large number of urban settlements as census towns.

In the Indian federal structure, urban development is a state subject. Census towns are identified as urban settlements by the Census once in a decade. The legal power to grant the settlement an urban administrative status lies with the respective state governments. As a result, even if a census town has acquired all urban characteristics, it continues to be administered by a rural local government (*Gram Panchayat)*, unless the state government grants it an urban administrative status. The paper tries to understand this unique aspect of census towns, more specifically the challenges in governing these settlements. The second section gives an overview of census towns and their characteristics. The third section discusses in-depth the governance and institutional issues of census towns in ensuring a proper development to cater to increasing population pressure and new economic activities. The paper concludes with a discussion on future trends of census towns and recommendations for policy makers.

SETTLEMENTS IN TRANSITION – CENSUS TOWNS

Official definition of urban areas in India is derived from the Registrar General of India (RGI), as part of the census operations every decade. The census identifies urban settlements in two categories (i) Statutory towns – these are administratively declared as urban settlements under a state law and are governed by an urban local government; i.e. Municipal Corporation, Municipality, *Nagarpalika*, Notified Town Area Committee, Cantonment Board (ii) Census Towns - these are existing villages that are identified as urban by the census subject to fulfilling of three specific urban characteristics, i.e. (a) population size more than 5,000 (b) density of at least 400 persons per sq km and (c) occupation of at least 75% of male workforce in non-agriculture sector. Census towns are complete settlements that are administratively rural in character but identified as urban by census operation. Census towns continue to be administratively treated as 'rural' – as it is governed by *Gram Panchayats* and not urban local bodies; as is the practice for urban areas in India.

The number of census towns increased from 1,362 to 3,894 during the decade 2001-2011, while the number of statutory towns (STs) increased marginally from 3,799 to 4,041. This phenomenon has been termed as 'unacknowledged urbanisation' (Pradhan 2013), 'denied urbanisation' (Samanta, 2014) as these census towns are yet to be administratively declared as urban by the respective state governments. In India, 'urban development' is a state subject and the responsibility to set the criteria and declare a settlement as urban lies with respective state governments.

The share of urban population residing in census towns has doubled from 7.4% in 2001 to 14.4% in 2011 (Roy & Pradhan 2018). There has been much debate about the underlying reasons causing this high increase in census towns. Is it due to a 'spill over effect' of existing large urban centres or is it 'dispersed' and 'in-situ' development of rural areas (Mitra & Kumar 2015, Pradhan 2013). However, studies have shown that 70%

of the peripheral growth in the million-plus urban agglomerations (UAs) during the 2001-2011 decade is due to the census towns (Roy & Pradhan 2018). This signifies that rural areas/ villages in the peripheries of large cities are growing due to spillover effects of the development of the city. For example, Noida in Uttar Pradesh is the largest census town in India; it has a total population more than 6 lakhs in 2011. Noida is located in the National Capital Region (NCR) and its growth is attributed to its close proximity to New Delhi. In fact, 12 out of the 20 top census towns in India in terms of population is in the National Capital Territory of Delhi (Tiwana, 2020).

The regional distribution of census towns across India is mostly concentrated in the highly industrialized states of Tamil Nadu, Maharashtra, West Bengal and Kerala (Mitra & Kumar, 2015). Also a positive correlation is noticed between number of statutory towns and new census towns of a state (Mitra & Kumar, 2015). These are indicative of transformation of the rural-urban interface at the periphery of large cities where urbanisation is taking place. Urban population in India is mostly concentrated in the large cities and its periphery (Census 2011). Major cities like Delhi, Mumbai, Hyderabad, and Kolkata have witnessed rapid population growth on their peripheries in areas beyond their official administrative boundaries (Ellis & Roberts, 2016). A significant share of manufacturing employment growth is taking place in the periphery of seven large Indian cities; which indicates that the rural areas in the vicinity of these large cities are undergoing rapid transformation.

CHARACTERISTICS AND GROWTH OF CENSUS TOWNS

The periphery of large Indian cities are characterized by a wide diversity of social and economic activities that often conflict and compete with each other for land, water and other resources. It is a zone of transition that is characterized by the co-existence of rural and urban land-use, institutions and diverse social and economic activities (Dikshit 2011). The settlements in the periphery areas are usually villages, i.e. rural areas, with some urban settlements and cantonment boards or Industrial Notified Areas (INA). Due to the spill over effect of the economic activities of the city, the villages undergo rapid transformation and emerge as census towns. Changes are noticed in terms of rapid population growth leading to landuse changes and emergence of informal networks of infrastructure delivery to cater to the burgeoning population (Dikshit 2011, Vishwanath et al 2013).

There are two main theses on the evolution of peri-urban areas in India (Dupont 2007) – the first points out that, peripheries of Indian cities are characterized by dominant presence of underprivileged settlers comprising of rural poor migrants to cities, who are unable to find a foothold in the core city due to higher costs of living; and resettlement of slum dwellers from the city to the periphery, as a result of demolition drives undertaken by the city administration. This is coupled with degradation of the environment in the periphery, due to shifting of polluting and heavy industries from the city to its peripheries (Kundu, Pradhan etal 2002). However there is another theses which emphasizes that peri-urban areas are characterized by heterogeneity and segmentation of spaces – unplanned villages juxtaposed with planned townships or industrial areas. Such fragmentation takes place due to the mix of planned operations through development of townships, SEZs, IT Parks along with unplanned development by flouting of regulations.

Chandigarh, the first planned city of India had legal provisions to curtail unplanned growth of the city, through the Periphery Controlled Area Act, 1952, which recommended a 16 km wide green belt around the planned city, and prohibited establishment of any town, village, commercial or industrial activities in the periphery zone. Inspite of this legal provision, the periphery of Chandigarh has witnessed rapid and unplanned growth. Some estimates reveal that the population in the periphery towards Haryana itself has grown almost five times in the last three decades (Narain etal 2014:7). As per census 2011 there are six urban settlements in Chandigarh's periphery - only one of them is a statutory town while five are Census towns (Census 2011). During the decade 2001-2011, number of villages reduced from 24 to 12, and urban area has expanded. A total of 12 villages in the periphery of the city that had acquired urban character were

merged to the Municipal Corporation jurisdiction in 2006 (Census 2011). Out of the remaining 12 villages, five are now identified as census towns, two as outgrowths, and only five remain as villages or rural areas. This is an indication of the rapid transformation taking place in the periphery of Chandigarh. This rapid growth is due to various reasons, one of it being the violation of the Periphery Controlled Area Act, by the state governments of Punjab and Haryana to set up satellite towns of Panchkula and Mohali within the green belt (Narain et al 2014:5). Also inability of the planning authorities to control unplanned illegal development in the rural settlements in the periphery of Chandigarh; which took place in response to rising demands of accommodating migrants and low skilled workers (Sharma et al 2011).

Neoliberal economic policies adopted by the national and state governments encourages Information Technology (IT) and real estate sectors to set up gated enclaves and IT parks in the periphery of large cities. The metropolitan area of Chennai (1189 sq km) is almost seven times larger than the limits of Chennai city (176 sq km), and has a population growth rate of 1.5 times; which is attributed to the spillover of Chennai's growth into its periphery (Lorraine et al 2014). The Chennai Urban Agglomeration has 47 census towns in 2011 (Census 2011), which are spread across the new IT parks and industrial estates set up in the periphery of Chennai city. The IT Corridor has grown towards the south of the city towards Mahabalipuram, engulfing several villages and hamlets that were dependent mainly on agricultural and fishing activities earlier (Narain et al 2014). The outskirts of Chennai show co-existence of villagers who still grow paddy thrice a year, practice livestock rearing and fishing; along with gated urban high-rise buildings and upmarket medical, educational and entertainment facilities catering to them (Narain et al 2014:10).

The periphery of Ahmedabad is also witnessing rapid growth due to multiple reasons, industrialization in Sanand to real estate boom in Bopal (Vakharia 2014). Census 2011 registered 10 census towns in Ahmedabad Urban Agglomeration and 36 outgrowths (OGs) which are in the periphery of existing urban areas of Ahmedabad, Gandhinagar, Sanand, Kalol. Golf courses, farm houses and high-end residential development around the western periphery of the city that promises better lifestyle, along with industrial clusters that have emerged in the eastern and south western periphery of Ahmedabad. But this growth is not uniform, it is related to the transport links, that serve as nerve centres of development. So most large cities have witnessed emergence of census towns in their periphery along existing or new transport corridors.

Unplanned, unregulated fast growth in city outskirts area is very common and development along transportation corridors outside the boundary of a city is a natural phenomenon is most Indian cities. However, due to the unplanned growth of census towns, they exhibit poor quality or total lack of physical infrastructure, such as water supply, sewage system, solid waste management and lack of amenities like fire station, government hospitals, gardens, schools, playgrounds. These issues become more complex due to the piece-meal, non-contiguous development that takes place. As these settlements are in transition, change of land use and new economic activities puts severe pressure on the environment and ecosystem. Urbanization at these places comes with the cost of depletion of environment resulting in serious disruptions of ecosystems and loss of natural resources like forests, vegetations, lakes, water bodies. This might result in deforestation, depletion of water, grasslands etc. Moreover at time the periphery is conveniently selected as landfill sites for dumping the waste from the city. This happens due to the failure to integrate environmental concerns along with urban planning or the lack of it.

Problems of solid waste management, urban flooding, ground water depletion, salinity intrusion, sand mining and encroachment of open spaces and water bodies by real estate was found in the settlements in Chennai's periphery (Narain et al 2014: 12). New gated communities set up systems within their enclosed spaces, but they throw solid waste and sludge outside. The haphazard development by different agencies of the government and private sector in a piecemeal approach makes environment and ecosystem very fragile. In case of Ahmedabad, natural lakes and open areas have turned into dumping grounds, have been encroached by squatters or are in an extremely deteriorated condition in Bopal census town (Vakharia 2014).

GOVERNANCE AND INSTITUTIONAL ISSUES

Local governments were given the formal status as the third tier of government through the 73rd and 74th Constitution Amendment Act (CAA). Prior to it, local governments existed across the states but did not have defined functional and financial domains. The 73rd CAA, 1992 was meant for rural local governments or *gram panchayats* and the 74th CAA, 1993 is for urban local governments or ULBs. The 74th CAA recognizes the 'transitional areas' and recommends granting them civic status in the form of '*nagar panchayats' or town panchayats*. However since urban development is a state subject, it is a prerogative of the state governments to create this new category. As a result, while some states have shown enthusiasm and declared a large number of Town Panchayats like Tamil Nadu, other states like Maharashtra, West Bengal have not taken any initiative to define this category of towns, thus leaving these areas as amorphous, undisciplined areas outside the legal jurisdictions of any urban local body (Dupont 2007, Shaw 2005). With no proper governing institution in place there is violation of building regulations or total absence of them, resulting in unplanned unregulated development.

Just like their transitional status, administrative jurisdictions in the census towns are also transitory – between rural and urban governance. Census towns are governed by g*ram panchayats*, which do not have the funding or capacity to undertake large infrastructure projects. Local governments in these areas mostly deal with operation and maintenance of services like solid waste collection, street lights, birth and death certification etc. Financing and construction of infrastructure is done by state governments directly through its departments or agencies or specialised organisations. Peri-urban areas are often under the jurisdiction of multiple administrative institutions, having fragile relations and inadequate financial powers resulting in an uncertain environment and jurisdictional ambiguity (Sircar 2017). Key challenges are poor institutional setup, lack of capacity, shortage of funds, multiplicity of authorities, low revenue generation, non-recognition and lack of planning, information gap. Absence of any strong institutional structure for proper governance and development of peri-urban area leads to weak infrastructure. The powers and functions with rural local governments are not sufficient and effective to resolve the problems of city expansion with its meager financial capacity. The responsibility of providing infrastructure and co-ordinating the development in the periphery areas of a city is usually handled by multiple agencies, some of which may be state-level agencies, national institutes and local agencies. Urban authorities ignore problems of these transitional areas as they are outside its administrative boundaries. Overlapping of functions creates confusions and results into lack of service provision.

Different states have evolved different systems for development of infrastructure in periphery of large urban areas. In some states like Gujarat, peri-urban areas of most big cities, are included in the planning areas of Urban Development Authorities (UDAs) which prepare a Development Plan for the city. The development plan is a long-term (usually 20-25 years) landuse plan which deals with aspects of urban expansion, mobility, environment and develops guidelines and regulations. The very purpose of including areas beyond the municipal limits in the planning area is to prevent/control unplanned and irregular development in the cities periphery. These UDAs also are responsible to develop the large and trunk infrastructure in these areas, with financial support from the state government, that is later handed over to the local government for maintenance. For census towns that are located in the periphery of such large cities, they are included in the development plan of the core city; which may enable proper planned development of these settlements. But states and cities which do not have a proper system of spatial planning in place, unregulated development of census towns is noticed. The example of Bopal-Ghuma in Ahmedabad's periphery is a case in point. The area has been developed by AUDA which was responsible for funding and building of trunk infrastructure. AUDA is a specialized agency under the Urban Development Department of the Government of Gujarat. Transition of institutional status of Bopal- Ghuma reveals its dynamic status – it was first a census town and was governed by two *panchayats,* later they were merged and upgraded to a Nagarpalika. Finally these two settlements have been merged within Ahmedabad city's jurisdiction, i.e. within Ahmedabad Municipal Corporation.

In some cities infrastructure in the cities periphery is often developed on a 'multi-stakeholder arrangement' or 'public-private partnership' where government agencies works with a range of private and non-profit organisations for building infrastructure and providing services (Baud and Dhanalakshmi 2007). In the absence of any strong local government – characterized by piece-meal development works carried out by different departments or agencies of the government – national, state and local and sometimes private; often without any coordination with each other. In many cities, NGOs, civil society groups have been found to play a major role in response to weak governance systems (Shaw 2005, Narain et al 2014).

In a study of two peri-urban locations in Chennai Baud and Dhanalakshmi (2007) find that though both the areas have similar characteristics, there is difference in level of service provision and the way in which projects get implemented. Both municipalities initiated construction of underground sewerage system in a multi-stakeholder arrangement but the outcomes were very different. The study attributes this to the way local communities organized themselves, which helped in coordinating and negotiating with different departments and agencies.

DISCUSSION

Most studies done on census towns points to the unplanned and unregulated growth taking place and the need to ensure proper planning of these areas to be able to harness their potential (Sircar, 2017). This review reveals that there are no standard systems of infrastructure delivery in census towns – it depends on the location of the settlement. If a census town is located in the periphery of a big city it might become a part of the spatial urban plan; which ensures regulated development. However many cities may not be regularly updating their spatial plans or include census towns in these plans. Census towns not located in the vicinity of a large city, rarely has a spatial plan in place. It is governed by a rural local government which does not have the mandate, capacity and resources to prepare a long-term development plan. These settlements experience unregulated development in the absence of established rules and regulations that keep pace with their rapid development.

Even though the institutional framework has been laid out in the 74th CAA, very few states have taken initiative to set up an institutional and management system for census towns in their states. In many states, there is a dominance of state level agencies and parastatals, mostly Urban Development Authorities, which undertake planning and implementation of infrastructure projects. These agencies work directly under the directions of the state government departments without any coordination with the local government. Coordination amongst the agencies is rare and often they do not hand over the infrastructure assets to local governments, which lose their significance, thus giving rise to issues about citizenship and confusion amongst residents (Sircar, 2017). With neoliberal policies of investment by private sector in township projects, SEZs and IT Parks, many cities have witnessed a 'leapfrog' development, with patches of planned enclosed spaces surrounded by unplanned illegal development. Most programmes and policies of the national and state governments treat 'urban' and 'rural' as separate categories, thus there are no coordinated efforts to tackle issues of census towns.

The research highlights the need for developing a systemic approach for planning and management of infrastructure in census towns. Studies on future prospects of census towns reveals that economic development of census towns is dependent on specific and place-based policy interventions like roads, housing and other infrastructure services (Roy & Pradhan 2018). In the absence of which census towns may not flourish as efficient urban systems in future. The current policy discourse in India does not recognize the unique characteristics of census towns and they continue to be governed as villages. In some instances, state governments don't want to declare census towns as urban as it would mean giving up on rural development funds from higher levels of government (Bhagat 2005). Census towns located in the vicinity of large cities have got some attention and interventions in terms of services and infrastructure development. But very little attention is being given to census towns located near small cities or existing as

a cluster of large villages. It is high time that the policy focus is shifted towards studying the growth patterns and development issues of census towns across India.

REFERENCES

Baud, I. & Dhanalaxmi, R. "Governance in urban environmental management: Comparing accountability and performance in multi-stakeholder arrangements in South India" *Cities* 24 (2), pp 133-147.

Bhagat, R B (2005): "Rural–Urban Classification and Municipal Governance in India," Singapore Journal of Tropical Geography, 26(1), pp 61–73.

Census 2011. District Census Handbook: Chandigarh. Village and Town Directory. Directorate of Census Operations: Chandigarh.

Dikshit, Jutta K. (eds). *The Urban Fringe of Indian Cities*. Rawat: New Delhi,2011.

Dupont, V. "Conflicting stakes and governance in the peripheries of large Indian metropolises – An Introduction." *Cities,* Vol. 24 No. 2, 2007, pp 89-94.

Ellis, P and Roberts, M. *Leveraging Urbanization in South Asia: Managing Spatial Transformation for Prosperity and Livability*. World Bank, 2016.

Jana, A. How Urban Is India? IIHS Case No 1-0002. 2016. Bangalore. Indian Institute for Human Settlements.

Kundu A. "Method in madness: urban data from 2011 census." *Economic and Political Weekly*, XLVI (40), 2001, pp 13–16.

Kundu, A., Pradhan, B.K. & Subramanian, A. "Dichotomy of continuum: analysis of impact of urban centres on their periphery." *Economic and Political Weekly* 37(14), 2002, pp5039–5046.

Loraine Kennedy, Aurélie Varrel, Eric Denis, Véronique Dupont, R. Dhanalakshmi, et al.. Engaging with Sustainability Issues in Metropolitan Chennai. 2014, pp.63. halshs-01061314 available at https://shs.hal.science/halshs-01061314

Mitra, A. & Kumar, R. "New Patterns in Indian Urbanisation: Emergence of Census Towns." *Environment and Urbanization Asia*, 6(1), 2015, pp 18-27.

Narain, V., Banerjee, P. &Anand, P. "The Shadow of Urbanization: The Periurban Interface of Five Indian Cities in Transition." East-West Centre Working Paper No 68, January 2014.

Pradhan, K C. "Unacknowledged Urbanisation: The New Census Towns of India," *Economic & Political Weekly*, Vol XLVIII (36), 2013, pp 43 - 51.

Roy S. & Pradhan K.C. "Predicting the Future of Census Towns." *Economic and Political Weekly* LIII (49), 2018, pp 70 – 79.

Samanta, G. "The Politics of Classification and the Complexity of Governance in Census Towns," *Economic & Political Weekly*, Vol 49 (22), 2014 pp 55–64.

Sharma K.D, Deodhar P., & Bali B. "Dynamics of the Rural Segment around a Planned City and the need for a broader framework." *The Urban Fringe of Indian Cities* edited by Jutta K. Dikshit, Rawat: New Delhi. 2011, pp 124-142.

Shaw, A. "Peri-urban interface of India cities. Growth, governance and local initiatives."*Economic and Political Weekly*, 40(2), 2005, pp129–136.

Sircar, S. "Census Towns in India and what it means to be 'urban': Competing epistemologies and potential new approaches", *Singapore Journal of Tropical Geography*, 2017, doi:10.1111/sjtg.12193

Tiwana, A. "Nuances of Census Towns in India: Praxis, Trends and Spatial Patterns of Non-statutory Urbanisation". *Transactions*, Vol. 42, No. 1, 2020

Vishwanath, T., Lall, S., Dowall, D., Lozano-Gracia, N., Sharma, S., & Wang, Hyoung Gun. *Urbanization beyond municipal boundaries : nurturing metropolitan economies and connecting peri-urban areas in India*, Worldbank: Washington D.C, 2013.

Vakharia, R. "Institutional changes in peri-urban areas challenges and prospects: a case of Bopal-Ghuma Nagarpalika", *Unpublished dissertation,* 2016, CEPT University.

CLIMATE CHANGE STUDIES

FACING ARIDITY

DIANA WOODCOCK

Ph.D., VCUarts Qatar

ABSTRACT

The purpose of this paper and presentation is to share poems that address the current environmental crisis of climate change. The poems chosen are from my 2021 poetry collection, *Facing Aridity*, a finalist for the 2020 Prism Prize for Climate Literature (Wayfarer Books/Homebound Publications). Inspired by research expeditions and artist residencies in Alaska, the Arctic Circle, the Everglades, and southern Africa, and by fifteen years spent living in Arabia, it features poems tinged with sorrow while offering hope as they wring out lyrical beauty from the beleaguered yet resilient natural world. Rooted in truth, they zoom in closely on the negative effects of human activity before panning back out to celebrate earth's grand design. Serving as witness to climate change while advocating for preservation and conservation, I invite readers to open themselves to earth's suffering – to global sorrow – in order to transform and be transformed.

INTRODUCTION

The following poems are from my poetry collection, *Facing Aridity*, which was a finalist for the 2020 Prism Prize for Climate Literature (Homebound Publications/Wayfarer Books, 2021). This first poem opens the collection.

WHY WE MUST NOT FAST-FORWARD PAST THE SCENE

inspired by Netflix series "Our Planet," 2nd episode, "Frozen World"

Desperate to find resting space,
they've scaled heights they shouldn't have,
and now their poor eyesights' causing them
to misjudge the distance to the sea.

Tumbling off 250-ft. high sharp cliffs
to their deaths, one-ton marine mammals
smash onto the rocky beach and fellow
pinnipeds below, lie limp in crashing waves

of Alaska's Chukchi Sea in these
climate-changing days projected decades
ago – coming sooner than expected –
sea ice habitats melting, fueling monster

hurricanes, torrential rains, crop-killing
droughts and disease. It isn't hard to see
loss of biodiversity and humanity's fate
are intertwined – there's no time to waste.

We must not cover our eyes, must realize
and face the heart-breaking facts, swiftly act
to keep fossil fuels in the ground, sound
the alarm whoever wherever we are,

protest against all grotesque climate
change deniers. Too soon Pacific
walruses' doom will be our own.

From my desert home with its oil

and gas fields, its tainted air
and sickness everywhere, I pray
for the lands of white vistas, glaciers
and seas – may they stay free of oil slicks,

protected from those with tricks
up their sleeves, pray we'll all rise up
and believe in our right to demand and win
climate justice for the walrus and for us.

Bathing in moonlight tonight,
the skin at its height of sensuality,
I face the tragic reality – my kin,
Pacific walrus, are near their end,

driven by selfish men to the cliff edge.
And we – we're right behind them,
the whole world on the edge, all of us
together in this fight for life, each

summer winter day minute the last.
Witnessing the tragedy, we ensure
we will endure and resist, will risk
it all to remain steadfast.

In 2016, I participated in the Arctic Circle Summer Solstice Art and Science Expedition to the High Arctic, for which I received an Exploratory Grant from my university. This grant allowed me to explore, through creative writing, the world's northernmost tip as I researched the Arctic Circle's natural resources and history, sailed the waters between Norway and the North Pole, and observed the research being conducted in the region. The following poems resulted from that experience.

NEAR THE ARCTIC CIRCLE

Day 1, waiting to set sail,
the mind fixed on krill,
seals, Blue whales, and the thought
of Omega 3 pills offered for sale
at pharmacies and Amazon.com.

Krill oil supplement a detriment
to sea birds and mammals—to
the critically endangered Blue.
Foundation of the ocean's food web,
small, shrimp-like crustaceans

in decline by eighty per cent,
on the frontlines of climate change,
melting sea ice finishing their habitat,
ocean acidification impairing these key
players in slowing global warming—

carbon dioxide transported by them
from surface to deep water.
The mind weighed down by facts,
then lifted this first day out,
west coast of Spitsbergen, by a long,

slender Fin whale—the captain killed
the engine. We all kept still,
silent, holding breaths and waiting
five, fifteen minutes for each breaching—
each tall blow twenty feet high.

Day 2, I would see my first Blue.
But this first day out, it would be a Fin
that stole my heart away. Eyes no longer
glazed over by calendar and datebook,
I would look upon one Fin and realize

how seasons run. I would become
this first day out devoted to Fins, recalling
they were the ones to outrun whaling ships
early commercial fishing days till steam-
powered vessels and explosive harpoons

caught up with them.
Watching one Fin in that one
of a hundred places where mystery's
source can still be sensed, I'd be brought
to my knees, as Rilke promised,

watching the ease of a Fin whale
causing the sea to rise and swell—
its compulsion to move through water,
my conscience taken along for the ride—
joy to rise out of me each time

its sickle-shaped dorsal fin would surface,
sun-dazzled, and I'd decide this Fin
holds within its being all the answers,
like a mandala, precisely designed,
then swept away.

PILGRIMAGE TO THE NORTH POLE

One sea angel, tiny gastropod, feeding
on ice algae, has me meditating on the green-
brown sludge of life essential to the survival
of Blue whales and Polar bears,
penguins, seals and tiny krill.

Now with polar sea ice vanishing,
scientists sail toward the North Pole
to extol it, smashing frozen seas to search
massive chunks of ice for it, the timing
of its bloom still a mystery. Assumed

that it starts in June, they have found other-
wise. With warmer weather, thinning ice, it's
blooming early, the cope pods that gorge
on it peak prematurely, and Little auk parents
have no food for their chicks. Now one sees

how the stakes are raised – the ripple effects,
from krill up to Polar bear as sea ice melts.
I think we should all make a pilgrimage
not to Mecca's Kaaba or Jerusalem's
Wailing Wall, not to Mexico City's Our
Lady of Guadalupe. No, I say
we should journey – like China's ancient poets
into their mountains – to the polar regions,
descend into the unknown ice, be thrown
off-balance as we search for algae while

chunks of sea ice are smashing and breaking,
thrashing around us – search for strands
of the sludge of life, and come to understand
we are kin. Only when we let ourselves
feel with the thrill of a naturalist will

the excitement of an untrammeled
North and South Pole draw us back into
the circle of life – ice bright as pear blossoms,
algae pale as an amber ale giving itself
to the krill and all others who hunger.

SVALBARD GLOBAL SEED VAULT

Outside Longyearbyen, eight hundred
miles from the North Pole, scientists,
counting and envisioning the cost
of past and future disasters – even
Syria's civil war – Aleppo's seed bank
destroyed by bombing 2015 –

have tucked into a mountainside,
ensured in permafrost, ample space
for four and a half billion critical
crop seeds worldwide. If the worst
should happen, this backup collection
will safeguard vegetation.

Or is it all mere speculation –
no place feasible but the hereafter.
But how to disentangle ourselves
from earthly (Arctic) time and space?
Standing in front of the entrance
to the doomsday seed vault –

something about it putting a halt
to doubt – I began envisioning
what the seeds are all about.
Was it too late to practice faith?
Dalal from Kuwait had brought
seeds from her desert home,

assuming she could contribute
them right there and then.
Tottering on the threshold
of before and after, I prayed
for faith as small as that biblical
mustard seed. Immerse myself,

I coaxed, in the hope of seeds,
that someday planted,
they can reverse the damage.
Feeling a thirst for roots,
recalling the burning bush –
how thorns and thistles are not

the earth's original natural fruit –
I wished upon a seed deposited
just then in the scat of that snow
bunting warbling and hunting
insects beside the mountain stream
flowing past the global seed vault,

toward the sea, under the midnight sun.

ARCTIC BERG

Zodiac ride to a glacier, day five.
The big event: a huge blue-streaked
iceberg, calved from the glacier

like a monumental sculpture,
broke in half right in front of us as if
our guide, taking us along for the ride,

had arranged it, after which we sailed
through the open water
in between the two ice-blue chunks –

one half-brown with swept-up rocks
and gravelly ground. These the sounds
all around: sizzling and explosive popping

of the berg as tiny air bubbles broke free,
stalactite-like drip of drifting melting ice,
melt ponds trickling, widening cracks,

leaking nutrients into the water,
calving of the glacier – all this noisy
activity while a Black guillemot

sat serenely on a nearby ice floe –
its bright red feet planted as firmly
as anything can be in these faltering times.

BEARDED SEAL

Atop a chunk of drifting ice floe
on the shallow water shelf
lounged a lone, long-whiskered seal,

its ginger-brown face as calm
as could be, though if it were me,
I'd feel our ship seemed to drift

a bit too close for comfort.
Still, the seal didn't budge,
busy about its molting, preferring

not to enter the water just then.
Its elegant array of long stiff whiskers
curling at the ends. Its small head

pointing downwind and towards the water,
hearing and smelling what may prowl behind it,
seeing what's in front. Always on edge,

alert for a polar bear or killer whale attack.
What I would have given to have heard this one
vocalize to advertise its suitability—

to have heard its downward spiraling trill,
sweeps and ascents as it sang
underwater to attract a female.

But this very one our ship had cozied up to,
hauled out on an ice floe just then, late
June, flexing its square-shaped flippers

and its long claws every now and then,
seemed done with all courting and mating attempts
for another year. And by its calm demeanor,

it did indeed appear as nonchalant
as anyone these days can possibly be
about melting ice in the Barents Sea.

SKETCH OF THE ARCTIC

A contradiction,
but the best description
of the Arctic: robust
and varied, yet vulnerable
to climate change.

Complex. Everything connects,
adapted to harsh conditions –
some species so specialized
they can't exist otherwise.

Pearl of contrasting hues –
earth tones and layered shades of blue
in cracks and holes of icebergs
and floes. Veils of waterfalls
over sheer rock.

Flowering tundra,
scouring glaciers,
towering bird cliffs.

Mosses, grasses, lichen.

Shrill-calling kittiwakes.
Trumpeting barnacle geese.
Warbling snow buntings.

Those little brothers
of the Arctic, puffins.
Bearded seals. Polar bears.
Walrus with their long tusks.

A biosphere offering a solution
for over-population – organisms
having fewer offspring than southerly species –

the cold a kind of birth control.
Growing, maturing more slowly,
delaying of the aging process.

Yes, paradise too late discovered
as the ice retreats, the permafrost
thaws, temperatures rise,
southerly species begin moving in –
will they bring with them
viruses and bacteria?

Such a disgrace –
this precious pristine place
not generating much pollution
the recipient of pollutants
transported from distant lands,
poisoning the food chain.

So much at stake
when humans take
more than their share.

SUMMER SOLSTICE NEAR THE NORTH POLE

Last evening, strong winds end of dinner
had us heading for the deck to watch
the steady horizon – or to our beds to lie flat.

Near midnight, the captain turned off
the engine. Huge waves slamming
against my porthole cast my cabin

into darkness one instant, midnight sun
the next. Drifted to sleep once we stopped
while the ship still roughly rocked.

This morning we pass by Moffen,
protected island reserved for walrus
and breeding birds – Brent geese,

Sabine's gulls, Common eiders,
Arctic terns. Just now one solitary
walrus in view, the other several hundred

on the island's far side, our guide
surmises. Thoughts turn now
to the Inuit hunting ice-dependent

species. What will become of them
when the creatures follow the ice
northward – climate change-driven?

Along Spitsbergen's west coast,
thrust sheets on mountain sides –
folding of rocks prodding them eastward,

forming a new mountain belt.
Three million years and twenty to thirty
ice ages, with warmer interglacial stages

interspersed. I try to envision the collision

of plates – earthquakes and volcanism.

But all I see, so lovely, from my ship

are the results – complex patterns

caused by all that folding and faulting.

Everything in flux, but holding.

NOTES:

“Svalbard Global Seed Vault” – In 2015, the first withdrawal was made by researchers in Syria after their seedbank in Aleppo was destroyed by bombing. Those seeds have since been sent to Morocco and Lebanon, where they'll be planted and used to research how to grow crops in the arid region.

PUBLICATION CREDITS:

“Svalbard Global Seed Vault” – *Beltway Poetry Quarterly* (received Pushcart Prize nomination); *Raw Art Review*

"Summer Solstice near the North Pole" – *Naugatuck River Review*

The following poems appeared in *Near the Arctic Circle* (a chapbook), published by Tiger’s Eye Press/Infinities Series: “Arctic Berg,” “Bearded Seal,” “Near the Arctic Circle,” and “Sketch of the Arctic.”

LINGUISTICS AND LANGUAGE STUDIES

COGNITIVE LINGUISTIC APPROACH TO TEACHING CASES IN CROATIAN AS A SECOND AND FOREIGN LANGUAGE: THE CASE OF ACCUSATIVE AND LOCATIVE

HELENA BURIĆ, JOSIPA KORLJAN BEŠLIĆ

Faculty of Humanities and Social Sciences

University of Split, Croatia

ABSTRACT

In this paper, we will explain how the principles of cognitive linguistics can significantly help when teaching cases in the Croatian language, using the example of teaching the accusative and locative cases. Croatian is an inflected language, in which grammatical categories are expressed by changing the forms of words in morphological paradigms, and one of the biggest problems encountered by students of Croatian as a second or foreign language (Croatian as L2) at the beginner levels are the cases. The Croatian language has seven cases, each of which implies specific suffixes according to grammatical gender and the singular or plural form of nominal words. However, besides memorizing suffixes for different forms of nominal words, an even bigger problem for students is understanding when to use a specific case form in a sentence, i.e., in the linguistic context. Each case in Croatian is used in different concrete, physical, but also more abstract, metaphoric meanings, and they are taught through their function, i.e. service in a sentence, their relationship with verbs, and their correlation with the semantics of a certain preposition is particularly significant.

However, different cases often share the same prepositions, and the prepositions themselves are extremely polysemous, which creates an impression of unsystematic, almost random use of cases and the impossibility of mastering them and acquiring language competence, especially for students at the beginning levels of learning Croatian. In this paper, using the example of the accusative and locative cases, we explained how the cognitive linguistics principles can help when teaching cases, their usage in context, and elucidating their relationship with different prepositions.

The cognitive linguistic approach to teaching cases emphasizes their semantic component, thereby enabling the more „economical" approach to their teaching because it reveals the fundamental schematic meanings of each case in a psychologically, i.e. cognitively based way. Namely, from these schematic meanings all other different prepositional and non-prepositional, prototypical and non-prototypical, physical and more abstract, metaphorical sub-meanings of a particular case emerge. These meanings and sub-meanings form structured and coherent semantic networks based on the prototype effect, rather than random syntactic-semantic situations, that significantly help students understand cases and acquire the language in general. In the frame of cognitive linguistics meaning is defined as the mental conceptualization of our own experience with different entities from the extra-linguistic world and their mutual relationships in real, physical space. From a cognitive linguistic perspective, different meanings of each case can be reduced to one fundamental, prototypical meaning. From this, it follows that all the various sub-meanings of accusative

can be reduced to the concept of goal, and locative to the concept of location or placement. Consistently pointing out the connections between different sub-meanings and the fundamental prototypical meaning significantly facilitates mastering the cases in the Croatian language.

Keywords: cases (accusative, locative), prepositions, Croatian as a second and foreign language, cognitive linguistics

1. INTRODUCTION

Since Croatian is an inflected language, in which grammatical categories are expressed by changing the forms of words in morphological paradigms, one of the biggest problems encountered by students of Croatian as L2, especially at the beginner levels of learning, are the cases. The Croatian language has seven cases (nominative, genitive, dative, accusative, vocative, locative, and instrumental), which take specific suffixes according to grammatical gender and singular or plural form of nominal words. Nominative and vocative are independent cases and the rest are oblique cases. Independent cases occur in the mental space independently of any relation with any other component of the grammatical structure. On the other hand, the oblique cases are not independent, namely, in the mental space similarly as within the framework of the grammatical structure, they enter into certain relations with other entities and such a relation is inherent to them. In addition to the inflection of nominal words, in the Croatian language, there are also inflections of verbs by person (conjugation), comparisons of adjectives and adverbs, and various other linguistic derivations, etc.

However, apparently in learning and mastering Croatian as L2, the biggest problem for students is the cases, i.e. the declensions of nominal words. Namely, for all three grammatical genders (masculine, feminine, and neuter), there are specific case endings in their singular and plural forms. When special suffixes used in the declension of adjectives, pronouns, and numbers are added to them, it is easy to understand why so many students of Croatian as L2, especially those whose native languages are not as morphologically developed and have fewer cases than Croatian or have them in „a stunted formlike English, consider Croatian to be „a difficult language" to master. This attitude can affect their motivation for learning from the very beginning. However, besides memorizing different suffixes for various word forms, an even bigger problem for students is understanding when to use a specific case form in a sentence or linguistic context, i.e. understanding their different meanings and sub-meanings. The term „meaning" in this paper refers to basic schematic concepts and prototypical meanings, and „sub-meanings" to the meanings that arise from them.

Since Croatian, as mentioned earlier, belongs to morphologically complex languages, in teaching Croatian as L2, a grammatical approach to teaching is necessary, so cases are taught through their function, i.e., their role in the sentence, relation with verbs, and their relationship with the meaning of certain prepositions. However, different cases often share the same prepositions, and the prepositions themselves are extremely polysemous, which creates an impression of unsystematic, almost random use of cases, and thus the impossibility of mastering them and acquiring the expected language competence.

In this paper, we will explain how cognitive linguistics principles can help teaching cases and their relationship with prepositions in the Croatian language, using the example of teaching the accusative and locative cases. Of course, the same approach can be applied in teaching other cases and grammatical concepts in general. Namely, the cognitive linguistic approach to teaching cases emphasizes their semantic component, thereby enabling a more „economical" approach to their teaching because it elucidates the fundamental schematic meanings from which all other numerous prepositional and non-prepositional meanings and sub-meanings of a certain case arise. These meanings and sub-meanings mutually form structured and coherent semantic networks based on the prototype effect, rather than random syntactic-semantic situations, which significantly helps students in understanding and acquiring language.

2. THEORETICAL AND METHODOLOGICAL BACKGROUND

One of the basic cognitive abilities, which is also the basis of language production in general, is the human mind's ability to categorize the world around us. In the framework of cognitive linguistics, the theory of categorization based on the prototype effect is accepted (Rosch 1975; Lakoff 1987; Taylor 2009), which assumes that a given category includes not only central prototypical examples but also less prototypical ones that lack some features possessed by the prototype, but there is enough of them to be perceived as members of the same category. Categorization is most direct when the prototype is schematic concerning

one of its members, and then that member represents the elaboration of the prototype scheme. However, as we have already pointed out, non-prototypical examples can also be found in the same category, which in the language most often represent metaphorical, figurative extensions of the prototypical scheme or some other extension of its meaning. The categories are therefore radially organized, but it is possible to recognize a direct or indirect connection with the prototypical members in all other members of the category. Within grammatical categories, therefore, we can recognize prototypical and non-prototypical meanings and schematic and specific meaning levels, and these two assumptions can be powerful tools in the context of teaching and acquiring cases and language in general.

Case markers include a set of universal, probably innate, notions that cover certain types of judgments that human beings can make about events around them, judgments about who causes them, to whom they happen, and what changes in the process (Fillmore 1968: 24 according to Belaj and Tanacković Faletar 2014). Since we are writing this paper from the perspective of cognitive linguistics, the work of Ronald Langacker, followed by Branimir Belaj and Goran Tanacković Faletar, who published *Cognitive Grammar of the Croatian Language: Noun Syntagma and Case Syntax* in 2014, in which on the foundations of Langacker's cognitive grammar, they analyze the semantic motivation of case coding. The semantic description they offer is based on the assumption about the existence of schematic conceptual structures that frame all other more specific sub-meanings of a certain case. What should be noted is that, following the principles of cognitive linguistics in this paper, we don't understand cases as exclusively a grammatical category connected to a certain syntactic function, as is the case in formal approaches to language, for example in transformational-generative grammar. We understand them as a semantic-grammatical category that has an internal structure and a general, schematic meaning to which all other sub-meanings are connected or from which they derive. The basic schematic meanings of cases within the framework of cognitive grammar are based on the localist theory (Anderson 1971; Talmy 2000a, 2000b; Langacker 1987; Tyler and Evans 2003), i.e. on the assumption about the spatial experiential background of case concepts, i.e., on the assumption about the possibility of defining general case meanings based on our experience of space and the different spatial relationships we perceive, and which are repeated to a significant extent in the world around us. This, of course, doesn't mean the mere acquisition of vocabulary, but rather the acquisition of grammatical patterns and concepts at all language levels.

These ideas were also confirmed by neuroscience, where within the framework of the cognitive maps theory, important evidence of the spatial foundation of human perception, and thus of a holistic approach to the description of the meaning of oblique cases, was provided (Belaj and Tanacković Faletar 2014: 249). As we have already mentioned, the basic meaning of accusative is defined as the concept of the goal of a process profiled by the particular verb, locative as the concept of location or space, genitive as the concept of origin, the dative of directionality, and the instrumental as the concept of parallelism (Belaj and Tanacković Faletar 2014: 249).

As we have already pointed out, within the framework of cognitive linguistics, meaning is understood as a certain conceptualization realized in an imaginary spatial domain in which different relations between different entities are established. It is important to emphasize that this imaginary spatial domain is closely related to our human experience of real physical space and the fundamental relations and constellations we perceive. It is precisely on these spatial ideas that the concepts of goal, location, origin, directionality, and parallelism are based, which, as we have stated, represent schematic conceptualizations or meanings that stand in the background of various sub-meanings of oblique cases in Croatian. Mentioned basic meanings don’t represent only schemes of different relationships between material, and physical entities from the real world but also abstract, metaphoric, and metonymic meaning extensions. In other words, conceptually prominent spatial scenarios, which we observe in the extra-linguistic, real world, serve as a base, i.e. as prototype scenarios for different linguistic articulations of meaning, which can be a direct elaboration of the prototype scenario, but also its metaphorical extension. After all, it would be difficult to imagine a mind that doesn’t recognize similarities between different human experiences and that doesn’t establish connections

between the material and immaterial world, physical and mental experiences, therefore, it would be difficult to imagine a language that for each new abstract, emotional or psychological experience has to invent completely new grammatical categories and completely new ways of articulating them. With the help of described principles, the case learning process is „economized", and the feeling of learning random case usages is replaced by a picture of cognitively based meanings and their connection with the fundamental human notion of relationships between different entities from the world around us emerges very quickly.

Cognitive linguistic sub-theories and principles, which form the backbone of this work, are the principles of cognitive grammar (Langacker 1987, 1991, 1999, 2013; Belaj and Tanacković Faletar 2014, 2017), the principle of categorization based on the prototype effect, the relationship between schematic and specific in language (Langacker 2013), the conceptual metaphor theory (Lakoff and Johnson 1980, 1999), the localist case theory (Anderson 1977; Taylor 2002; Langacker 2008; Ljiljana Šarić 2008) and the theory of deep cases, i.e. semantic roles (Fillmore 1968; Langacker 1991; Belaj and Tanacković Faletar 2017).

In the following chapters, we will explain how these ideas can be applied in teaching Croatian as L2 using the examples of accusative and locative. In doing so, we will first describe the prototypical meanings of the accusative and locative cases, and then the less prototypical, figurative, and metaphoric meanings We will explain how they are related to the basic spatially based schematic meanings. At the end, we will propose how to teach them.

3. TEACHING ACCUSATIVE AND LOCATIVE CASE

Before we start analyzing the meaning and usage of the accusative and locative cases, we must mention that the first case that students of Croatian as L2 encounter is the nominative case. The nominative case, along with the vocative case, is one of the two independent cases in Croatian, which means that the nominative case doesn't have any specific relation with any other component of the grammatical construction. In other words, no particular relation is an intrinsic part of its meaning structure, so it doesn't bind special prepositions or adverbs. The primary function of the nominative in Croatian is to encode the subject, or in cognitive linguistic terms - the conceptually most prominent member of the relation or trajector,[1] and this is prototypically the entity that dynamically carries out the process indicated by the verb, but also the one that is spoken about in the sentence. In the Croatian language, it also expresses the noun, pronoun, or adjective as a part of the predicate (nominative predicate), but this function is beyond the scope of this paper. Nominative case, therefore, represents the basic form of nouns and is the only case form that doesn't take special suffixes in its singular form. It is used in its basic, dictionary, out-of-context form, and at the same time, due to its cognitive prominence, it is the easiest to recognize, and so it is the one that is the easiest for students to understand and adopt.

3.1 Constructions with the Accusative Case

In Croatian language classes, the second case to be taught, i.e. the first oblique case that students encounter, is the accusative case. The accusative is the case of the direct object of the construction, and this is how it is taught in the teaching of Croatian as L2. Its suffixes are taught in different grammatical genders and numbers (singular and plural) similarly to its different prepositional and non-prepositional usages, and everything is practiced together on various more and less prototypical examples. However, teaching experience shows that this is a rather demanding concept for students, and everything becomes even more complex when other oblique cases start to be taught, each of which implies its suffixes, special relationship

[1] The concepts of „trajector" and „landmark" are essential for the conceptual presentation of the content of the simple and complex linguistic units (Langacker 1987), which in the framework of cognitive linguistics represent the fundamental elements of every conceptual structure and reflect the spatial nature of the human perception of the world surrounding us. The terms trajector and landmark are analogous to the terms „figure" and „ground", which are used in the same sense by Leonard Talmy (2001).

between verbs and nouns, different prepositions, etc., especially because the same prepositions are often used with different cases. However, within the framework of cognitive linguistics, as we have already mentioned, the most diverse accusative referents, both in prepositional and non-prepositional use, can be described as specific variants of the schematic concept of goal (Belaj and Tanacković Faletar 2014: 409).

3.1.1 Constructions with Non-Prepositional Accusative

The schematic concept of the goal is established through a cognitively very prominent, easily observable scenario from the extra-linguistic world, which implies direct contact between two actants; one of which is dynamic and represents the source of energy flow in the chain or the initiator of energy transfer, i.e. in cognitive linguistic language – Agent, and the second is the goal of the energy flow or Patient. In prototype scenarios the Patient is static, but under the influence of the Agent's action undergoes a visible change. It is important to note that the target entity or Patient is affected by the action expressed by the verb as a whole, in its entirety.[2] This is important to highlight because the scenario in which the entity is partially affected in Croatian is coded with the genitive case (Belaj and Tanacković Faletar 2014: 410).

The most prototypical examples of such scenarios are described by transitive verbs such as *uništiti* (destroy), *razbiti* (break), *udariti* (hit) or *potrgati* (tear) which imply direct transfer of energy and landmarks which are actually direct objects of the sentence as in *Marko je uništio* ***automobil*** (Mark destroyed **his car**) or *John je razbio* ***prozor*** (John broke **the window**), but there are equally numerous less prototypical examples, where there is no direct physical contact, and a visible physical change is absent, as is the case, for example, in scenarios of mental or perceptual activity, but which, in the mind of the conceptualizer, share a sufficient number of characteristics with the prototype scenario, so we classify them in the same category and code them with the same type of schematic, transitional construction, such as that with the verbs *voljeti* (love), *mrziti* (hate), *slušati* (listen) or *gledati* (watch) in constructions like *Marko voli* ***Anu*** (Marko loves **Ana**) or *Ana gleda* ***film*** (Ana is watching **a movie**).

Also interesting in this context are examples of transitive verbs such as *preletjeti* (flyover), *preskočiti* (jump over), *obići* (go around), and similar, which also don't imply direct contact between actants or a concrete change of entity in the target domain of the energy transfer chain, as it would be in the prototypical scenario, but which nevertheless fit into the accusative schematic concept of goal, because in constructions like *Marko je preskočio* ***ogradu*** (Marko jumped over **the fence**) or *Avion je preletio* ***planinu*** (The plane flew over **the mountain**) the landmarks, i.e. the accusative referents are in the mental focus of the nominative trajector, and thus they also represent a specific goal of the action expressed by the verb (Belaj and Tanacković Faletar 2014: 413). It should also be noted that the meaning of the above verbs implies the completeness of the performed action, i.e. the fence cannot be partially jumped over and the mountain can not be only partially

[2] The transitivity of the construction is closely related to the features of the construction subject, as the cognitively most prominent participant in an energetic situation and the initiator of the flow of energy. Transitivity is a grammatical category linked to the lexical-grammatical properties of the verb, that has the role of the predicate of the construction, and its ability to manage its complements in oblique cases. In its prototypical form, transitivity is a linguistic reflection of our fundamental notion of how the most diverse entities enter an energetic, dynamic interaction in the real world. Langacker illustrates the dynamic part of the real world with a billiard-ball model. A combination of the billiard-ball model, the stage model, which emphasizes the role of the conceptualizer, and the semantic role model together form a canonical event model. The canonical event model also includes two archetypal roles, namely the roles of Agent and Patient. The concept of transitivity includes several different parameters, all of which reflect particular aspects of the canonical event model (Rice 1987 according to Langacker 1999: 25). When the canonical event is linguistically coded to a maximally neutral verb construction, a dynamic relationship is established between the Agent and the Patient, that is, the subject and the direct object, with a one-way flow of energy. Of course, the described prototype model includes numerous non-prototypical, abstract, and metaphoric scenarios. See, for instance, Langacker (1991, 2008) and Belaj and Tanacković Faletar (2017) for more information.
The main difference between the terms trajector/landmark and Agent/Patient is that trajector and landmark describe the two most cognitively salient elements of any scenario or linguistic structure (temporal or non-temporal), and Agent and Patient are always part of a temporal relation, that is, one that includes a specific process, i.e. verb.

flown over, and as we mentioned before completeness or wholeness is an important determinant of the accusative concept of goal.

The verb *imati* (to have) is also transitive, even if it doesn't represent a prototypical transitive verb in the sense of direct physical contact and a visible change in the object referent. However, even in constructions such as *John ima **novu kuću*** (John has **a new house**) or *Mary ima **prijatelja Ivana*** (Mary has **a friend Ivan**), it is easy to see the concept of goal and the completeness of the involvement of the accusative referent in the process expressed by the verb, in the sense of the completeness of possession. Therefore, although in these examples there is no physical contact between the subject and the object, nor the transfer of energy from the subject to the object or visible change that the object suffers, the sentence is constructed as transitive based on the completeness of the possession of the object by the subject.

One of the non-prototypical, peripheral situations coded with the accusative case is the one expressed by temporal accusative, which implies that a certain time segment is completely „filled by some verbal process, but not as a direct object, i.e. participant in the process expressed by the particular verb, but as the duration of the process. In these cases, accusative landmarks as a whole are not affected by the physical action of nominative trajectors or the subject of the sentence, but by the duration of the process itself (Belaj and Tanacković Faletar 2014: 410) for example in *Radila sam u kazalištu **prošli tjedan*** (I worked in the theater **last week**) or *Pisala sam knjigu **prošlo ljeto*** (I was writing the book **last summer**). But even these peripheral examples can fit into the accusative schematic concept of goal, which, as we mentioned, implies complete involvement in the action that the verb profiles, therefore the mentioned examples mean that the „last weekor „last summerwere filled by the particular subject's activity.

Similarly, the accusative of measure is used in sentences like *Spavala sam **cijelu noć*** (I slept **all night**) or *Ana je učila **cijeli prošli tjedan*** (Ana studied **all last week**), in which the completeness of the period affected by a certain process is also profiled. This unequivocally fits into the schematic accusative concept of the goal and its semantic subcomponent of involvement of a certain entity in some process in its entirety, i.e. as a whole.

When it comes to the accusative of measure, there are other examples such as *Kino je udaljeno **kilometar*** (The cinema is **a kilometer** away), *Ivan je visok **195 centimetara*** (Ivan is **195 centimeters** tall) or *Hladnjak je težak **30 kg*** (The refrigerator weighs **30 kg**). In these examples, the accusative encodes the measure of something, be it a specific spatial distance, height, or weight, which is once again from beginning to end, as a whole, encompassed by a static process coded by a combination of an adjective and an auxiliary verb, so in these examples too, the schematic accusative concept of the goal and its meaning component of the complete involvement of landmarks are easily discernible.

With all the above examples, once again we need to emphasize their spatial foundation and the conceptual metaphor TIME IS SPACE, based on which it is possible to code such scenarios using the accusative case. Namely, in all the mentioned examples, including non-prototypical ones such as *Ana je učila **cijeli prošli tjedan*** (Ana studied **all last week**), the relationship between the process expressed by the verb *učiti* (study) and the time interval *cijeli prošli tjedan* (all last week) is structured based on the accusative concept of goal which includes the notion of completeness of involvement of accusative referent in the process, based on our experience of a physical object that occupies some space, so on the metaphoric level we conceptualize a certain time segment also as a space filled by some verbal process.

3.1.2 Constructions with Prepositional Accusative

In the following, we will analyze the use of accusative with the prepositions *u, na, po, kroz* and *za*, which are covered at the beginner level in most textbooks for Croatian as L2. Other prepositions are used with accusative in Croatian too, but in this paper, we analyze the meanings of accusative (and locative) in the context of teaching the Croatian language at initial levels, therefore they are out of the scope of this paper.

Of course, other prepositional usages of accusative can also be explained through the schematic accusative concept of goal.

3.1.2.1 Constructions U + Accusative and Na + Accusative

In constructions involving the prepositions *u* and *na* with an accusative landmark, the trajector is a dynamic entity that moves towards a static landmark as the final goal of the movement with which it comes into contact eventually, where the landmark is once again fully engulfed by the action expressed by the verb as in the examples: *Idem **u školu*** (I am going **to school**), *Putujemo **u London*** (We are traveling **to London**), *Idem na otok (I am going **to the island***), *Pjevač se popeo **na pozornicu*** (The singer went up **on the stage**).

When translated into English, the preposition *u* can be translated as *in*, *at*, *by*, *into*, *to*, and *on*, and the preposition *na* as *on*, *upon*, *by*, *in*, *at, to,* and *into*. In Croatian, the construction *u + accusative* is used above all to encode movement towards closed, three-dimensional spaces such as closed objects, buildings, houses, rooms, etc., or entities that we conceptualize as closed spaces, i.e. spaces that we also perceive as bounded and that have some entrance or passage through which we enter them, such as cities, countries, continents, natural phenomena, etc. Therefore, the prototypical translation of the Croatian preposition *u* into English would be *in* or *into*.

On the other hand, the preposition *na* is used for spaces that we perceive as two-dimensional or flat surfaces that the subject must physically climb and that in the prototypical scenario support him from below and so, the prototypical translation of the Croatian preposition *na* would be *on* or *upon*.

As in the earlier examples, when it comes to constructions with prepositions *u* or *na* and the accusative case, there are also more and less prototypical examples, i.e. metaphorical extensions of the prototype, so, for example, constructions like *Penjem se **na krov*** (I am going up **on the roof**) or *Mačka se popela **na stol*** (The cat climbed **onto the table**) represents the elaboration of the prototypical scenario, but in the clauses *Putovat ćemo na **Novu godinu*** (We will travel **on New Year's Eve**) or *Ići ćemo na ručak **na Praznik rada*** (We will go for lunch **on Labor Day**), the construction *na + accusative* occurs in a time context in which the accusative temporal referent represents the day when something is celebrated or marked. In these sentences, time is constructed in a two-dimensional and punctual way, and the accusative referent in such contexts also represents a specific goal of the process, which is fully encompassed by the action. Such examples are described by Belaj and Tanacković Faletar (2014: 426) as a conceptualization of the relationship between the event itself and its temporal dimension, where the time interval is coded by accusative as a bounded two-dimensional space that is in the metaphorical contact with the trajector.

Examples like *Idemo **na koncert*** (We're going **to a concert**), *Želim ići **na izložbu*** (I want to go **to an exhibition**), *Pozvana sam **na zabavu*** (I was invited **to a party**), etc. are also interesting because in them, regardless of whether the verb refers to actual movement in space (like the verbs to go, drive, walk, travel, etc.) or no (as in the example I was invited to the party), the prepositional phrase *na + accusative* represent the ultimate goal of a real or imagined movement or a movement that will happen in the future. Based on the conceptual metaphor EVENTS AND ACTIVITIES ARE BOUNDED SPACES, the accusative referents that have the meaning of different events in these constructions are metaphorically constructed as two-dimensional places that represent the ultimate goal of the movement of the trajector and which are fully encompassed by its action.

Similarly, in expressions like *Marija je naišla **na pohvale*** (Marija encountered **praise**) or *Oni su naletjeli **na otpor*** (They ran **into resistance**), abstract, immaterial entities such as praise and resistance are conceptualized through metaphorical mapping as physical, material entities that the trajector unexpectedly encounters.

There are also examples such as *On uvijek misli **na mene*** (He always thinks **of me**) and *Ljuta sam **na tebe*** (I am angry **with you**), in which accusative referents represent the ultimate goal of mental or emotional

directiveness and are profiled as a whole encompassed by some mental process (Belaj and Tanacković Faletar 2014: 427).

In contrast to the construction *na + accusative* which profiles the relationship of contact directivity with a landmark conceived as a two-dimensional entity whose upper surface the trajectory reaches in the final phase of the process and which supports it, the construction u + accusative" profiles the relationship of contact directivity with a three-dimensional body in which the trajectory enters, therefore which is conceptualized as a bounded, closed space with an entrance. After all, the meaning of intralocativeness is inherent to the preposition *u* in the Croatian language (Pranjković 2001: 9). As we have already stated, prototypical examples of such a scenario would be examples like *Marko ide **u školu*** (Marko goes **to school**) or *Turisti idu **u muzej*** (Tourists are going **to a museum**), and the little less prototypical *Ana putuje **u London*** (Ana travels **to London**) or *Mandy ide **u Tanzaniju*** (Mandy is going **to Tanzania**), in which cities or states are conceived as closed three-dimensional spaces with an entrance. In all examples, the schematic accusative concept of goal is easily visible.

Deviations from the prototypical scenario, which nevertheless share all important characteristics with it, are examples like *Moram ubaciti još nekoliko rečenica **u tekst*** (I must insert a few more sentences **in the text**) or *Ne možeš upadati **u moj život** kad god poželiš* (You can't barge **into my life** whenever you want), in which entities such as text and life are conceived as closed three-dimensional spaces in the target domain that can be entered.

3.1.2.2 Construction Po + Accusative

The preposition *po* in the Croatian language can be translated as *about, after, upon, on, along, during, at, by,* or *in*, but in combination with the accusative, the preposition *po* has meaning to *pick up* or *to get something or someone*.

The construction *po + accusative* in Croatian is used with verbs of movement, and it always means movement intending to get, take or acquire something, for example, *Idem u trgovinu **po kruh*** (I'm going to the store **to get bread**) or *Žurim **po novine*** (I'm rushing **to get a newspaper**), and by metaphorical extension also someone, for example, *Idem na autobusnu stanicu **po prijatelja*** (I'm going to the bus station **to pick up a friend**) or *Upravo vozim u zračnu luku **po mamu*** (I'm just driving to the airport **to pick up my mom**). In these examples, the concept of goal profiled by the accusative in the target domain of the chain of action is also easily discernible, whereas, in the source domain, there is a trajector that moves towards the accusative referent intending to take, buy or acquire it with the implicit intention to take it in its private space and „transport" it somewhere. In any case, the accusative referents of the *po + accusative* construction are profiled in the first place as the intention or the planned goal of the trajector's real or the metaphorical movement, and in that kind of constructions, they are always encompassed by the action as a whole.

3.1.2.3 Construction Kroz + Accusative

The meaning of the Croatian preposition krozis *through*. A process coded by the relationship of a dynamic trajector that passes through a certain closed landmark or through a landmark conceived as a certain type of closed space through the mediation of the preposition *kroz*, which in the Croatian language implies the accusative coding of the landmark, therefore the construction *kroz + accusative* consists of a trajector that passes through different stages of the journey, starting from the initial boundary of the landmark, which, in prototypical scenarios, suggests a certain type of closed or bounded space such as a tunnel, corridor, underpass and similar, entering the inner part of the landmark and reaching the outer border, i.e. exiting the landmark, as in the examples *Autobus vozi **kroz tunel*** (The bus drives **through the tunnel**) or *Šetam **kroz park*** (I walk **through the park**). It is easy to see that such scenarios can also be described using the

schematic accusative concept of the goal based on the contact between the trajector and the landmark and based on the complete involvement of the landmark in the process described by the verb. Of course, since language is to a large extent metaphorical, i.e. figurative, the described scenario from the physical world can go through the process of metaphorization, so the same conceptual model can be used to describe situations like *Festival počinje **kroz tjedan dana*** (The festival starts **in a week**), *Različite misli prolaze mi **kroz glavu*** (Various thoughts run **through my head**). The preceding constructions are, therefore, metaphorical extensions of prototypical spatial uses of the preposition *kroz*, in which a certain time interval or part of the human body is conceived as a closed space with a clear entrance and exit.

3.1.2.4 Construction Za + Accusative

When translated into English the preposition *za* can mean *for*, *to*, *in*, *with*, *by*, and *during*, but the most often meaning that the preposition za conveys in the constructions with the accusative case is *for*. Even though very different scenarios can be coded by the preposition *za*, in all of them, the schematic accusative concept of the goal is also evident, and to a greater or lesser extent its meaning components of contact directiveness and completeness. At the initial levels of learning the Croatian language, examples of the *za + accusative* construction that are taught are:

*Kupila sam poklon **za mamu***. (I bought a present **for my mother**.)

*Knjiga je **za prijatelja***. (The book is **for a friend**.)

*Zamijenila je brod **za automobil***. (She exchanged the boat **for a car**.)

*Političari se bore **za vlast***. (Politicians are fighting **for power**.)

*Oni su bili borci **za slobodu***. (They were fighters **for freedom**.)

In all the examples given, the construction *za + accusative* once again profiles the different goals of the coded scenario. In all examples, some kind of movement and contact is present. However, they are not coded explicitly but are implicitly understood, so in all the mentioned examples, whether they are real or metaphorical, scenarios of the trajector's movement from the source domain to the target domain are profiled, and the construction *za + accusative* itself profiles some purpose or intention. In the first example, the gift is implicitly moving towards the target domain, i.e. the mother who will receive it, in the second a book intended for a friend, in the third a car which can be obtained by exchange, etc. As seen in the above examples, in all of them the real or abstract entities that represent particular goals that more or less agentive trajector wants to achieve are coded with the accusative, so they also fit unequivocally into the schematic concept of the goal.

3.2 Constructions with Locative Case

While the accusative case, similarly as other oblique cases, encodes a scenario with a certain degree of dynamism, the locative prototypically encodes a static scenario in which some static trajector throughout the entire process expressed by a particular verb is completely located within the boundaries of some locative-encoded space or landmark (Belaj and Tanacković Faletar 2014: 441) as in the examples *Ana živi **u Istanbulu*** (Ana lives **in Istanbul**), *Djeca su **u učionici*** (The children are **in the classroom**) or *Sjedim **na krovu*** (I am sitting **on the roof**).

There are also scenarios in which the dynamic trajector moves within a limited space without a clear goal of movement or the destination it should arrive at, i.e. its movement is distributed within a specific landmark or location. Such scenarios in the Croatian language are coded using the preposition *po* and the

locative case of the landmark, i.e. the construction *po + locative*, as in the examples *Djeca šetaju **po parku*** (Children are walking **in the park**) or *Trčim **po plaži*** (I'm running **on the beach**). Therefore, the fundamental meaning of locative, whether it encodes actual spatial scenarios or their metaphorical extensions, is the placement of the trajector within the boundaries of some limited landmark. In other words, all meanings and sub-meanings of locative-encoded entities arise from its schematic concept of location in space. It is also important to note that the locative is a prepositional case, which means that in the Croatian language, the entity coded by locative is always used with one of the locative prepositions. At the beginner level of learning Croatian, the use of locative with prepositions *u, na, po,* and *o* is taught. If we recall the accusative prepositions, we will immediately notice that accusative and locative share as many as three frequent and very fruitful prepositions (*u, na,* and *po*), which represent a significant problem for students of Croatian as L2. That's why it's important to emphasize the differences between their usages, as well as the basic schematic meanings from which all accusative and locative sub-meanings in their most diverse usages emerge. The fundamental difference between them is that accusative referents encode a specific goal of the scenario and explicitly or at least implicitly imply the movement of certain trajector towards a landmark, which represents the target of the process and with which trajector comes in contact, whereas, locative referents encode the location of trajector within limits of real or metaphoric space. With a consistent emphasis on the schematic meanings from which all other sub-meanings of the accusative and locative derive, students acquire these linguistic concepts much faster and start using them correctly much sooner.

As mentioned, the *u + locative* construction encodes three-dimensional landmarks in the interior of which some static trajector is located. Prototypical examples are those that arise from the concrete, physical experience of space, which are then projected onto other experiences and concepts such as time, mental states, emotions, activities, and other more abstract concepts, which in language can also be conceptualized as a space in which trajector is located, for example in *Ona živi **u ljubavi** s njim već deset godina* (She has been living **in love** with him for 10 years) or *On sjedi tamo **u tišini*** (He is sitting there **in silence**).

The construction *na + locative* also encodes the location of the trajector within a certain landmark, but with the preposition *na* the landmark is two-dimensional, so the trajector is always profiled as a static entity located on the upper side of the landmark, i.e., on it. In other words, in *na + locative* constructions, the landmark supports the trajector located on it. Referents from the real world for which we use the preposition *na* in the Croatian language are entities that, on a conceptual level, we generally perceive as a kind of supporting surface as in *Mark je **na otoku Braču*** (Mark is **on the island of Brač**) or *Mačka sjedi **na stolu*** (The cat is sitting **on the table**). The fundamental conceptual difference between the preposition *u* or *na + accusative* and the preposition *u* or *na + locative* is that in constructions with the accusative, the landmark represents the goal of the movement, so the trajector in such scenarios moves towards the landmark and then stops at it, while in constructions with the locative, trajector is located in or on the landmark during the entire process profiled by the verb (more about the cognitive foundation of prepositions, including *u* and *na*, see more in Šarić 2006). From this, it is easy to conclude that in constructions with the accusative the verb always encodes a certain movement of the trajector, and in constructions with the locative the verb constructs a certain staticity, i.e. it places the trajector in or on some two-dimensional imagined space for the entire duration of the process. The conceptualization that lies in the background of the *na + locative* construction is extremely fruitful for metaphorical extensions, which are often based on ontological conceptual metaphors such as ACTIVITIES ARE BOUNDED SPACES or EVENTS ARE BOUNDED SPACES, etc. (Belaj and Tanacković Faletar 2014: 446), so examples such as *Ja sam bio **na koncertu*** (I was **at a concert**) or *Studiram **na Medicinskom fakultetu*** (I study **at the Medical faculty)** come from them.

The *po + locative* construction also places the trajector within the boundaries of a particular physical or metaphorical landmark. An important component of the meaning of the construction *po + locative* is distributiveness, because such a construction profiles the more or less regular dispersion of a certain entity

within a two-dimensional or three-dimensional landmark, as in examples *Knjige su razbacane* ***po podu*** (Books are scattered **on the floor**) or *Svaki dan šetam* ***po plaži*** (Every day I walk **on the beach**). There are also metaphoric examples like *Milijuni pitanja mi se motaju* ***po glavi*** (Millions of questions are running **through my head**) or *Kopala je* ***po torbi*** *tražeći ključeve* (She fumbled around **in her handbag** looking for her keys). It is important to emphasize once again that in the case of the construction *po + locative,* the physical or abstract trajector is also located strictly within the boundaries of the landmark, i.e. the verb profiles a certain distribution of trajector within the limits of the surface profiled by landmark.

In the construction *o + locative* it is also easy to see the locative concept of location or placement, which represents the basic conceptual model for all locative constructions, including this one. In the Croatian language, the preposition *o* is used in the first place in the meaning *about*, for example in the constructions *Oni uvijek pričaju* ***o umjetnosti*** (*They always talk* ***about art***), *Pisac piše* ***o ljubavi*** (*The writer writes* ***about love***) or *Mary razmišlja* ***o putovanjima*** (*Mary is thinking* ***about traveling***). The preposition *o* in the Croatian language also has other meanings, i.e. when translating into English, the preposition *o* also translates as *to* or *by*, but these are beyond the scope of this paper. What is important to emphasize once again is that even with all these other meanings, the basic meaning of locative from which all the sub-meanings derive is observed, which, as we said, is the meaning of the location of trajector in a certain real or metaphorical space coded by the landmark of the particular construction. In the mentioned examples, in which the *o + locative* construction profiles a certain topic of thinking, writing, conversation, etc., the trajector is fixed or placed in a certain metaphorical space, which sets limits to its thought movement, which once again confirms the thesis that all locative meanings and sub-meanings derive from the fundamental concept of the location or placement of the trajector within limits of a certain landmark.

4. CONCLUSION

When learning Croatian, especially at the beginning levels, the basic problem for students is cases. The Croatian language is highly inflected and has seven cases, each requiring different suffixes. In addition to memorizing different suffixes for different forms of nouns (and other categories of words such as adjectives, pronouns, and numbers), a particular difficulty for students is understanding when they should use a certain case form in a sentence, i.e. in a linguistic context. Cases are traditionally taught through their function in a sentence, their relationship with verbs, and their correlation with the meaning of a certain preposition is especially significant. However, different cases often share the same prepositions, and the prepositions themselves are highly polysemous, which additionally gives students the impression of unsystematic, almost random usage of cases, and thus the impossibility of mastering them and acquiring language competence. The cognitive-linguistic approach to the teaching of cases emphasizes their semantic component enabling a more „economical" approach because it reveals the schematic meanings of each case in a cognitively or psychologically based way, from which all other numerous prepositional and non-prepositional, prototypical, and non-prototypical, concrete and abstract sub-meanings of a specific case emerge. These meanings and sub-meanings mutually form structured and coherent meaning networks based on the prototype effect, rather than random syntactic-semantic situations, which significantly helps students and facilitates language comprehension and acquisition in general. As we clarified in the paper, the most diverse uses of the accusative, prepositional, and non-prepositional, can be reduced to the schematic concept of goal. From this concept, the fundamental, i.e. prototypical physical, but also different metaphorical, figurative meanings of the accusative case arise. Similarly, the most diverse uses of the locative case can be reduced to the schematic concept of location or placement, from which, as with the accusative, all prototypical and non-prototypical locative meanings emerge. Together they form radial categories, which at their center have more concrete, prototypical meanings, whereas, at the different degrees of distance from the central meanings, we find numerous other non-prototypical, abstract, and extended meanings. By consistently emphasizing the schematic concepts that stand in the background of the most diverse meanings and uses of a particular case, their understanding and mastery are significantly

facilitated for students, because instead of a complex and mutually unrelated network of meanings and uses, it offers them two clear, psychologically and experientially based conceptual models.

Both the accusative concept of goal and the locative concept of location derive from our human experience and perception of some of the fundamental relationships between the entities that surround us in the real world, and their essential domain of conceptualization is space. Other cases in the Croatian language can be taught similarly because their most diverse meanings also derive from their basic, schematic meanings.

5. BIBLIOGRAPHY

Anderson, J. M. 1977. *On case grammar*. London: Croom HeIm

Belaj, B. and G. Tanacković Faletar. 2014. *Kognitivna gramatika hrvatskoga jezika*. *Knjiga prva: Imenska sintagma i sintaksa padeža*. Zagreb: Disput.

Belaj, B. and G. Tanacković Faletar. 2017. *Kognitivna gramatika hrvatskoga jezika. Knjiga druga: Sintaksa jednostavne rečenice*. Zagreb: Disput.

Fillmore, C. J. 1 968. "The Case for Case". Emmon Bach - Robert T. Harms (eds.) *Universals in Linguistic Theory*. New York: Holt, 1-88.

Lakoff, G. and M. Johnson. 1980. *Metaphors We Live By*. Chicago: University of Chicago Press.

Lakoff, G. 1987. *Women Fire and Dangerous Things – What Categories Reveal about the Mind*. Chicago and London: The University of Chicago Press.

Langacker, R. W. 1987. *Foundations of Cognitive Grammar. Volume I: Theoretical Prerequisites.* Stanford: Stanford University Press.

Langacker, R. W. 1991. *Foundations of Cognitive Grammar. Volume II: Descriptive Applications.* Stanford: Stanford University Press.

Langacker, R. W. 1999. *Grammar and Conceptualization*. Berlin: Mouton.

Langacker, R. W. 2008. *Cognitive Grammar*. New York: Oxford University Press, Inc.

Langacker, R. W. 2013. *Essentials of Cognitive Grammar*. Oxford: Oxford University Press.

Rice, S. 1987. *Towards a Cognitive Model of Transitivity*. San Diego: University of California.

Rosch, E. 1975. Cognitive Representations of Semantic Categories. *Journal of Experimental Psychology 104 (3)*: 192–233.

Talmy, L. 2000a. *Toward a Cognitive Semantics*. *Vol. 1*. Cambridge, MA: MIT Press.

Talmy, L. 2000b. *Toward a Cognitive Semantics*. *Vol. 2: Typology and process in concept structuring*. Cambridge, MA: MIT Press.

Talmy, L. 2001. *Toward Cognitive Semantics, Typology and Process in Concept Structuring. Vol. 1.* Cambridge, MA – London, England: The MIT Press.

Taylor, J. R. 2002. *Cognitive Grammar*. New York: Oxford University Press.

Taylor, J. R. 2009. *Linguistic categorization*. New York: Oxford University Press.

Tyler, A. and V. Evans. 2003. *The Semantics of English Prepositions: Spatial Scenes, Embodied Meaning and Cognition*. Cambridge: Cambridge University Press.

Šarić, Lj. 2008. *Spatial Concepts in Slavic: A Cognitive Linguistic Study of Prepositions and Cases*. Wiesbaden: Harrassowitz Verlag.

EVALUATING AI'S (IN)ABILITY TO TRANSLATE IN AN "INNOVATIVE" WAY AND CREATE EQUIVALENCE

PERIKLIS TAGKAS

Periklis Tagkas, Professor, University of Ioannina

ABSTRACT

Artificial intelligence (AI) has been used with computer aided translation (CAT) tools for several years and is, indeed, becoming more and more capable of rendering text that is quite "readable" and can, therefore, help the translator save time and energy. However, when it comes to finding equivalent terms or being innovative —when idiomatic or other expressions need to be properly rendered in another language, it is faced with several problems. In a way, it seems to remind us of its non human limitations. It may evolve in the future, no doubt, but for the time being, there are issues with translating word-for-word when what is needed is adaptation. This leaves room for translators, who should be creative by definition, to show their high level of not only expertise but also versatility.

The paper examines cases of such dilemmas from various sources —including books that the author has translated from English into Greek during the last six years. What emerges as a pattern is this repeatedly verified incompetence of various platforms and tools to grasp "grey" areas bordering on artistic, "poetic", or otherwise allegoric use of the language. In such cases, the context involves such a variety of social and cultural factors that AI simply cannot respond effectively. In a sense, the ability to act fast, producing results instantly, is inadequate because what is needed in those instances is to "take your time", even sometimes to "sleep on it" before you can come up with appropriate solutions, or suggested alternatives that will then have to be evaluated for the final decision to be made (by the human translator, of course). Acronyms —to provide an example— are a case in point. For instance, in a book on Management, reference is made to the 3 Ps of organizational performance (Profit, People, Planet), corresponding to the so-called "triple bottom line" that is nowadays a "must" in governance codes and has led companies to adopt CSR (corporate social responsibility) and ESG (environmental, social, governance) criteria in their reporting and disclosures. Now, AI can instantly translate the 3 Ps into Greek (or any other language, of course) word-for-word, but the problem is at a different level. The meaning is obviously rendered, but we also need the form to be appropriate in order to have an acronym that is equivalent to the 3 "Ps" in Greek (something that requires a "discretionary" approach, necessitating the use of synonyms and selection of the words that match the translator's demanding criteria. To put it simply, AI has to be an artist, too —which reminds us that translation is partly a science and partly an art.

In the paper, a discussion is also made of the possibilities of "educating" AI. This is a vast area that can turn it into a worthy servant and assistant (as its role is supposed to be). To put it simply, systems can learn from humans, and this efficiency-oriented perspective is invaluable for the translator's "workbench" and "toolbox". Being able to build AI's credibility by "feeding" it constantly with edited segments that later on will pop up as suggested translations can be a very helpful process that turns out to be an "investment" for a translator that aims for sustained effectiveness and improved performance. Lastly, the following topical question is offered for discussion: although we, as humanity, aim for more technological advances, are we going to be able to remain in control in this process? To what extent can AI be seen as a "menace" that will

“replace” translators (even as a long-term perspective) —or simply put them in the corner, assigning them just a secondary role? The above-mentioned “grey” areas representing “grey” areas of the mind —which AI cannot easily “master” (at least, not yet)— are hopeful indications of a possible “haven” for human translators and their career development.

Keywords: machine translation, artificial intelligence, equivalence, creativity.

INTRODUCTION

Artificial intelligence (AI) seems to have infiltrated many areas of our personal and professional lives in the 21st century. From the internet of things (IoT) to various tools and platforms used by professionals, AI seems to be constantly evolving as a valuable "smart" assistant, or supportive mechanism; indeed, its potential is enormous and pleasantly surprising. In the area of translation, a multitude of efficient computer-aided translation (CAT) tools (such as Google Translate, DeepL, Matecat, etc.) have made translators' lives easier by providing a helpful and convenient "workbench" that on the one hand permits consistent use of terminology and enhanced performance, while, on the other, it is also consistent with the current trend of "work from anywhere" (WFA) (Schermerhorn and Bachrach, 2023, p. 372), turning teleworking into mainstream and creating new, increased possibilities for translation professionals. As Yuxiu (2024) supports, compared with traditional MT, AI translation "benefits from its powerful language processing ability" and "has stronger adaptability and generalization ability through technologies such as deep learning".

From another viewpoint, however, all this "technological avalanche" involves also an element of menace, as in the long run it may prove to be a threat to the future of translators' careers and professional prospects. But is AI capable of replacing human translators or rendering them redundant? Although in some cases it may be possible to use AI and simply ask translators to do the "post-editing" (something that reduces them to little more than proofreaders as well as "wizards" of editing or "problem-solvers"), it is inadequate in cases where adaptation or equivalence (Vinay and Darbelnet, 1995) needs to be used as a translation approach.

In this paper, it is attempted to provide cases in point that prove the ineffective dimensions of AI when the demands of text (and context) "outsmart" the capabilities of technology, or where creativity, innovation, cultural nuances, or even "poetic inspiration" cannot be superseded by man-made tools, but require a high level of dexterity, knowledge, artistic sensitivity, versatility, and even a "delayed response" approach in order to find the optimum alternatives.

PROBLEMS RELATED TO TRANSLATING MEANINGS BUT NOT INTO APPROPRIATE FORMS

A problem that arises when having to translate meanings, but with the specific requirement of an equivalence in forms, is that AI does not possess the critical ability or "discretionary" approach to decide, taking into account a varied set of criteria, which option is the best or more appropriate alternative in different instances or contexts.

One such example, from a book on Management (Schermerhorn and Bachrach, 2023), is the use of the 3 Ps of organizational performance: profit, people, planet. If these words are translated literally, the result will not conform to the requirements of the source text, because while the meaning is properly rendered, the form does not allow the creation of an equivalent acronym; in other words, "3Ps" requires three Greek words starting with "p", while most AI-enabled translation tools propose 3 words starting with different letters: "k" ("kerdos" - profit), and "a" ("anthropoi" - people) and "p" ("planitis" - planet, which obviously derives from Greek). So, the acronym in Greek would be "kap" (which does not conform to the 3Ps). In order to solve the riddle, the translator needs to muster his or her creativity (Sixel, 1994) and versatility and come up with clever solutions, based on exploiting synonyms and polysemy. In other words, "profit" should be translated as "ploutos" (a word starting with "p", which means "wealth"), while "people" is translated as "polites" (again, a word starting with "p", which literally means "citizens"). This is an effective way of creating an equivalent acronym (3 Ps), while the meaning remains more or less the same. In fact, the form is more important in this case because the acronym functions as a "slogan" and, at any rate, it is regarded as more important when something memorable and imaginative is needed in both the source and the target language.

FIGHTING WITH POLYSEMY: "BOND" VERSUS "BONDS"

AI is still incapable of matching terms with contexts consistently. And this can be very "dangerous" if a translator trusts AI and neglects the importance of post-editing, which needs to be carried out with diligence and attention to details related to pragmatic parameters that can affect meaning –given also the varieties of English as an international language (Widdowson, 1994). Therefore, hard focus is also necessary in order to aim for accuracy, taking into account the discourse context, and pay attention to semantic and lexical-grammatical factors. A characteristic example would be the word "Bond": it would not be surprising for AI to confuse the name of the famous "007" with the financial term "bond" if the meaning is not clear from the context. That would be a blatant error and ought to be spotted by the human translator, provided that he or she has the "encyclopedic" knowledge of facts and figures and an increased awareness of contextual cues —as well as solid research skills that would allow him or her to search in dictionaries, electronic databases, websites, etc. in order to determine meaning and then select the appropriate word or phrase in the target language.

Let us now discuss another example that shows clearly AI's inadequacy in relation to the vast and perplexing area of pragmatics. Is "Yelp" a company's name or should it be translated literally (as AI actually does)? For AI or a CAT tool, it may be "fine" to translate the word literally; however, a human translator should be aware that there is something wrong with meaning when the sentence "just doesn't make sense". Therefore, the translator should always be suspicious and cautious, having in mind that this helpful and instantly available "servant" may prove to be a "traitor" (though "unintentionally") in the end.

Another problem translators often encounter is the use of a not-so-appropriate or optimum term which has acquired the status of an "established" term through its constant use, in the target language. One such example is the word "power", which can mean either "authority" or "strength" in the target language. In the case of English-Greek translations, the word has been translated in several books or scientific papers as "dynami" ("strength", literally), while its meaning could have been more appropriately rendered by using the word "exousia" (which means "authority"). In such instances, it is difficult to refrain from following the established norm, or "ignoring" tradition; therefore, the translator often follows the "beaten track", without having the "authority" (as both "power" and "strength") to "tamper with" a "sacred cow" that might get him or her into trouble, or entail a suspicion of inadequacy, or even lack of knowledge of the ("established", even erroneously) terminology.

Yet another example is the noun "ethics" (or the adjective "ethical"), which derives from Greek and (probably because of that) has extensively been translated as "morality" ("ithiki") into Greek, while its meaning is different in English and therefore should be translated into Greek as "deontologia" (differentiating it from "moral" and "morality", which has other, even theological and personal nuances). By choosing to use the word "deontologia" in Greek, the meaning is closer to the business context, as it is more related to following a firm's code of ethics that pervades conduct in the workplace (and is not linked to one's personal life and beliefs). However, the fact that the word "ethics" is associated with its Greek "roots" makes it difficult to change the established "norm" —though the author did exactly that in the book "Business Ethics" (Ferrell et al., 2022) that he translated from English into Greek in 2022, bringing the term closer to its present meaning in English, which is rendered by the Greek word "deontologia").

It should also be noted that "false friends" also create such problems. For example, the word "empathy", which also has Greek origins, cannot be translated into Greek as "empatheia" (whose meaning is "animosity" or "hostility"); its meaning is rendered by the Greek word "ensynaisthisi", which means being able to put yourself into another person's shoes. Therefore, this is also an area that requires attention, taking also into account the cultural bias stemming from inappropriate feelings of "national pride" or even "availability convenience" that impels people to choose the allegedly obvious and more convenient word that springs to mind (especially because of its resembling "form") —and this is how a "tradition" or "norm" can be established, making it difficult to "uproot" it subsequently.

Another example that creates slight confusion is the word "diversity", which is usually translated into Greek as "diaforetikotita" ("being different), although "polymorphia" or "poikilomorphia" ("having diverse forms") is also acceptable. When consistency is aimed at, a translator may find it difficult to decide in the face of polysemy (given also that CAT tools often render the word as "polymorphia", which is supposed to be the "second best" option —but AI would not be able to realize that and cannot be aware that another term has already become "mainstream" in the target language). In other words, AI cannot be fully aware of such parameters, nor can it be aware of the aim (*skopos*) (Nord 2006, p. 133) of a translation.

Finally, there seems to be a problem with translating certain English synonyms into Greek by using the same word. One such example is related to the words "prejudice" and "bias", which have both been translated in management terminology as "prokatalipsi", while bias literally means "merolipsia". Similarly, "skills" may sometimes be translated as "abilities", "capacities", etc. —which differs slightly from "dexiotites". Another problematic set is "effectiveness" and "efficiency"; here, the problem lies in the fact that sometimes AI renders both as "apotelesmatikotita" (which is the literal translation of "effectiveness", while "efficiency" should be translated as "apodotikotita" —a word which actually derives from "apodosi", which literally means "performance"). The above-mentioned cases create puzzling dilemmas for translators, who may also have to make decisions based on the editor's preferences, too. In another book on journalism, the word "videographer" was sometimes translated literally (as "videographos", which is not so common in Greek but, then, "videographer" is essentially a loan from Greek); in other cases, it was translated as "cameraman" ("eikonoliptis" in Greek). The translator was skeptical about which term to choose, only to find out later that the book's editor was in favor of using both terms, depending on the context and the "feeling" of which term "sounded" better or was perceived as more appropriate in different instances.

THE INADEQUACY OF AI IN RELATION TO EQUIVALENCE AND ADAPTATION

Attempting to translate "free-rider" (or "free-riding", as a phenomenon) into Greek, a search reveals different options (given that literal translation is not acceptable —it means nothing). In a book on Politics (Shepsle, 2010), it was regarded as more appropriate to opt for the more formal term ("free-riding" as "parasitismos"; in other words, the free-rider is metaphorically viewed as a "parasite"). Would AI be able to make such associations? Because, in less formal contexts, the word "tzambatzis" (someone who wants to have everything for free) has also been used, among other options, such as "lathrepivatis" (meaning, literally, "stowaway" in English).

Similar attempts are revealed in translating the "leaking pipeline" problem in organizations, too: it seems that in Linguee (www.lingue.com), for instance, this term has been translated in a much more imaginative and acceptable way than providing the literal translation (which has been the case in a previously published Greek translation, though the term is hardly understandable if we say "trypios agogos" ("a pipeline with a hole", literally); in contrast, the term is rendered by a Linguee translator as "the problem of declining percentages" ("to provlima ton fylloroounton pososton"), which is much more understandable and renders the meaning (given that the form is not a concern in this case).

Another characteristic example is the term "greenwashing". Despite the fact that its literal translation has, to an extent, been regarded as "acceptable" (as "prasino xeplyma", signifying little and requiring "interpretation" in order to be understood), an equivalence that was created and is used in Greek legal texts, as well, is "oikologikoi isxyrismoi" (literally, "ecological allegations" in English). This case proves how difficult, if not impossible, it would be for AI (or any CAT tool) to come up with such an imaginative way of rendering meaning, given that the literal translation of "greenwashing" into Greek was hardly comprehensible.

Similarly, CAT tools cannot be effective in translating terms such as "savoring" (from the field of "positive psychology"), which has been rendered into Greek as "apolamvanein"–a somewhat "archaic" infinitive,

meaning “taking delight”; or “burnout”, which has been rendered as “epaggelmatiki exouthenwsi” (“professional exhaustion”, literally).

Other common examples include “culture” (translated by sociologists as “ethniki koultoura” –“national culture”), “groupthink” (“agelaia skepsi”, while AI renders it as “omadiki skepsi”, whose meaning does not render the tendency of members to “conform” to the team leader’s proposals), or “social loafing” (propely rendered as “koinwniki okniria” –a term meaning “social laziness”, literally).

THE “SUBSTITUTION” ISSUE: AI VERSUS HUMANS

Undoubtedly, the rapidly evolving technology is looming as a potential disaster for a great part of the workforce in several countries. As it happened in the past, during the Industrial revolution, some jobs are lost and others are created, requiring more specialized skills. In the era of technological revolution, those who have a high technological IQ are definitely better positioned to cope with the demands of today’s jobs. But is the translator’s job one of those being threatened by AI? If so, to what extent?

It can be easily inferred from the cases discussed above that AI has not reached yet the status of a force that can eliminate the need for human translators. This is because it lacks the discretion that would allow it to discern the pragmatic circumstances and take them into account in order to come up with an overall “correct” translation; in other words, it cannot substitute the complexity of processes a human translator can combine when rendering meaning (and sometimes form, too), cultural nuances (Witherspoon, 1980), terminology, socio-linguistic parameters and so on. Moreover, humans possess both IQ and EQ, and can discern even emotional aspects that may be involved in rendering stylistic elements or even paralinguistic factors. In other words, human translators are far more capable of making “informed decisions” (Wood, 2016) and –depending on their background and experience– can claim to be “top performers” (especially those few who happen to be extremely knowledgeable in their area of expertise), or at least promote and support their critical ability and artistic flair (an area which, I believe, can make the difference between machines and humans —and this is an argument in favor of viewing translation not only as a science or as an academic discipline (a status it acquired during the second half of the twentieth century), but also as an art (Nida, 2014) which presupposes and requires sensitivity, awareness, empathy, versatility, talent, dexterity and many more skills that AI cannot combine —at least, not yet.

IMPLICATIONS FOR TRANSLATION STUDIES

Translation needs to incorporate the new trends and focus more on areas that require the translator’s “touch”, on the one hand, and on the need to “co-exist” and collaborate with AI. In fact, practice proves that it is possible to educate CAT tools, as they can be taught and become even better at both translating and following specific stylistic procedures. Memories can be really helpful and can strengthen and support a translator’s consistent rendering of terminology, by displaying already translated segments and therefore helping the translator get in touch with previously edited material, so as to save time and enhance accuracy and efficiency. High performance is greatly enabled by CAT tools and this is more true when having to translate books exceeding five hundred pages, with scientific terminology and various “traps” such as in the above-mentioned cases, which require both a clear mind and a deep knowledge of the relevant fields. It is essential therefore to tap into active translators’ know-how and bring their expertise close to the academic community, so that they can share their “workbench” realities with students-as-aspiring-translators and, generally, enrich the educational experience with practical training or experiential learning. It is worth also noting that translation is viewed by some researchers (e.g. Stibbard, 1998, p. 71) as a “fifth” skill —in addition to the four macro-skills, reading, writing, listening, speaking— and this corroborates the argument that students learning a foreign language can benefit and become better learners by engaging in translation activities —and, perhaps, the use of CAT tools may change the traditional approach that regarded the so-called “grammar-translation” methods of language teaching as rather “obsolete” (e.g. Duff, 1989; Vermes,

2010). By involving AI, translation can be integrated with several other macro- and micro-skills (e.g., Richards, 2001; Karakoc, 2019) and promote students' problem-solving abilities, intercultural communicative competence and overall effectiveness in communication. Finally, as Fodor (1983) and Anderson (1992) support, the processes of speaking, listening, reading and writing seem to rely on some kind of "mental translation".

CONCLUDING REMARKS

Undoubtedly, our professional as well as personal lives are changing rapidly due to technology and, especially, artificial intelligence. With regard to the translator's profession, there are still "havens" that have not "surrendered" to AI, because of (or thanks to) their inherent "inaccessibility". The cases in point analyzed in this paper prove that the human translator retains a critical role in the translation process, having the ability, skills and sensitivity to intervene, post edit, correct, reject, rephrase or even do research in order to render meaning (and form) in a correct and contextually appropriate manner. This is where we stand at the moment, not knowing what evolutionary steps may bring about critical changes in the future. It seems, though, that the complexity of divine creation – as incarnated by the human being– cannot so easily be "threatened" by man-made tools, platforms and "smart" applications.

REFERENCES

Anderson, M., 1992. *Intelligence and Development: A Cognitive Theory*. Oxford: Blackwell.

Duff, A., 1989. *Translation*. Oxford: Oxford University Press.

Ferrell, O.C., Fraedrich, J., Ferrell, L., 2022. *Business Ethics: Ethical Decision Making and Cases*. 13th ed. Cengage Learning.

Fodor, J.A., 1983. *The Modularity of Mind*. Cambridge, Mass.: MIT Press.

Karakoc, I.A., 2019. "Reading and Listening Comprehension Subskills: The Match between Theory, Coursebooks, and Language Proficiency Tests". *Advances in Language and Literary Studies*, 10(4), 166-171.

Nida, E.A., 2014. *The Art of Translation*. London: Oxford University Press.

Nord, Ch. 2006. "Translating as a Purposeful Activity: A Prospective Approach". *TEFLIN Journal*, 17(2), 131-143.

Richards, J.C., 1983. "Listening comprehension: approach, design, procedure". *TESOL Quarterly*, 17(2), 219-240. Schermerhorn, J.R., Bachrach, D.G., 2023. *Management*. 15th ed. New Jersey: Wiley.

Sixel, F., 1994. "What is a Good Translation? Some Theoretical Considerations Plus a Few Examples." *Translators' Journal*, 39(2), 342-361.

Shepsle, K.A., 2010. *Analyzing politics: rationality, behavior, and institutions*. 2nd ed. New York: W.W. Norton.

Stibbard, R., 1998. "The Principled Use of Translation in Foreign Language Teaching." In: Malmkjaer, K., ed. *Translation and Language Teaching: Language Teaching and Translation*. Manchester: St. Jerome Publishing: 69-76.

Vermes, A., 2010. "Translation in Foreign Language Teaching: A Brief Overview of Pros and Cons." *Eger Journal of English Studies* X, 83-89.

Vinay, J.P. and Darbelnet, J., 1995. *Stylistique Comparée du Français et de l' Anglais: Méthode de Traduction*. Paris: Didier. Translated and edited by J.C. Sager and M.J. Hamel (1995) as *Comparative Stylistics of French and English: A Methodology for Translation*. Amsterdam and Philadelphia, PA: John Benjamins.

Widdowson, H.G., 1994. "The ownership of English". *TESOL Quarterly*, 28, 377-388.

Witherspoon, G., 1980. “Language in Culture and Culture in Language.” *International Journal of American Linguistics*, 46(1), 1-13.

Wood, Julia T., 2016. *Communication Mosaics: An Introduction to the Field of Communication*. USA: Cengage Learning.

Yuxiu, Y., 2024. “Application of translation technology based on AI in translation teaching”. *Systems and Soft Computing* 6(5), 200072.

CULTURAL STUDIES

A GENEALOGY INTO THE FEMINIST WAVES: POLARIZATIONS, FEMINIST ISSUES, AND POLITICS OF MULTIPLICITY

MARINA FARIMA

Ph.D. Candidate, Eötvös Loránd University

ABSTRACT

The historical genealogy of the United States feminisms serves as a valuable framework for unraveling the intricate tapestry of political and social connections from the past to the contemporary digital age. This study explores the multifaceted landscape of U.S. feminism's evolution, traditionally categorized into three distinct "waves" representing distinct periods of feminist activism. While the wave metaphor has faced criticism for its propensity to oversimplify the nuanced issues that run parallel within defined timeframes, it has also been lauded for its role in advancing feminist knowledge and sustaining the momentum of feminist history.

Recognizing the central role of feminism in this research, the study commences by establishing a definition of feminism. Subsequently, it provides a historical overview of American feminism from the nineteenth century to the present, employing the "wave metaphor" to delineate the "first wave," "second wave," "third wave," and the contemporary "fourth wave."

The study also scrutinizes the dual nature of the wave metaphor, acknowledging its potential for reductive discourse as well as its utility as a functional tool for comprehending the storytelling, structure, function, and impact of the fourth wave. Furthermore, it emphasizes the diversity inherent in the fourth wave, asserting that it resists singular definition and universalization. Instead, this wave encompasses a rich tapestry of feminist activities taking place simultaneously across diverse spheres, each with unique agendas and multiple practices.

Keywords: Feminist Waves, Fourth Wave, Digital Feminism, Wave Metaphor, Feminist History

INTRODUCTION

Feminist movements have long been at the forefront of advocating for gender equity and challenging entrenched systems of oppression. From the suffragettes of the early 20th century to the digital activists of today, feminism has evolved in response to shifting social, political, and technological landscapes. Traditionally, the long-term process of raising one's voice for women's rights has been divided into three "waves," each considered distinct in its time and scope. While some feminist scholars critique the wave metaphor for its oversimplification of complex historical phenomena, others argue that it aids in organizing knowledge and promoting ongoing progress in feminist history. Building on this narrative framework, a new wave emerged in the early 2000s (Kaplan, 2003 p. 52), often referred to as the fourth wave of feminism or the "new digital wave of feminism" (Bates, 2014 ch. 12; Rivers, 2017 p. 1). This wave is characterized by its use of digital technologies and the internet as platforms for activism and discourse. Though many scholars approached the new wave and its use of the internet with optimism, such as Prudence Chamberlain, Kira Cochrane, Nicola Rivers, and Ealasaid Munro, others expressed that it "has yet to gain the level of prominence" (Dean and Aune, 2015 p. 381).

Twitter is highlighted as a significant platform for fourth-wave activism, leading Abigal de Kosnik and Keith Feldman (2019) to view it as a primary performance space for this wave's politics, while Kitsy Dixon coins the term "hashtag feminism" to describe this new form of activism (2014 p. 34). This integration of feminist agendas into mainstream media spaces has facilitated the spread of feminist ideas and practices.

While the fourth wave of feminism has been a focal point of recent scholarship, it is essential to contextualize this wave within the broader historical trajectory of feminist activism because each feminist wave is characterized by its unique challenges, goals, and methods of activism. Although they are not sequential or linear but rather overlap and interact in complex ways, they are continuing to shape the ongoing discourse around gender equity and social justice. Hence, this research seeks to explore the multifaceted nature of feminist activism, tracing its historical roots, examining its contemporary manifestations, and critically analyzing its ongoing relevance in addressing gender inequities.

FIRST WAVE FEMINISM

Scholars widely agree that the first feminist wave in the US started in the nineteenth century with the Seneca Falls Declaration as "the first formal assertion of the equal rights of women to the political franchise" (DuBois, 1998 p. 86). Although not christened as the first wave until the 1960s by feminist activists of that era, "the entire sweep of US women's rights activism from the 1840s to 1920 [was put] into a single wave" (Hewitt, 2012 p. 659). The Seneca Falls Convention of July 1848 marked a seminal juncture in the pursuit of women's rights. However, attributing the origin of women's suffrage solely to this event remains a subject of contention (Hewitt, 2010 p. 21). Furthermore, while this period serves as a pivotal point for identifying the commencement of the first feminist wave, it does not signify the origin of the women's movement, thereby underscoring the limitation of employing the wave metaphor, which inadvertently erases earlier women's advocacies.

The roots of women's suffrage trace back to two intersecting social movements, as argued by Carrie Chapman Catt and Nettie Rogers Shuler in their seminal work, *Woman Suffrage and Politics* (2020 Chapter 1). These movements sought to dismantle the Divine Right of Kings and the Divine Right of Men, respectively. Whereas the former eventually led to governmental restructuring, the latter's endeavor to emancipate women from patriarchal structures encountered prolonged resistance. By the 1800s, women's civil and legal standing remained fraught with disparities. Married women were "dead in law" and while single women were legally independent, they still faced constraints on managing their affairs, accessing employment was restricted primarily to the poor, and no woman at all was allowed to step over the threshold of a high school or college (Catt and Shuler, 2020 Chapter 1).

Margaret Brent, Abigail Adams, Emma Willard, Margaret Fuller, and the Grimke sisters are among the pioneering figures of the feminist movement whose contributions are often overshadowed by more well-known figures like Elizabeth Cady Stanton, Susan B. Anthony, and Lucretia Mott. These women played crucial roles in advancing

women's rights and challenging societal norms. Margaret Brent is noted as the first suffrage pioneer to advocate for the right to vote in the State Assembly. Abigail Adams famously urged her husband not to forget about women when drafting new laws, emphasizing the need for women's inclusion in the political sphere. Emma Willard founded the Troy Female Seminary in 1821, providing women with access to higher education at a time when such opportunities were limited. Margaret Fuller challenged patriarchal norms by openly defying the belief that women did not belong in libraries, symbolized by her act of "sitting at a table in a public library to read a book." The Grimke sisters were early advocates for the abolition of slavery and were among the first to speak publicly about this cause. The legacy of these early feminists alongside the broader movements they represent, laid the groundwork for the first organized women's rights movement, the Seneca Falls Convention (Catt and Shuler, 2020 Chapter 2). Another significant role that led to the organization of the convention was the newspaper written by Stanton and Susan B. Anthony titled *Revolution*. They used the newspaper as a platform to raise awareness about the injustices faced by women, advocating for their inclusion in the government and challenging societal norms. In her book, *Elizabeth Cady Stanton: The Right Is Ours*, Harriet Sigerman describes:

What Stanton and the others dared to do was organize a women's rights convention, which, they declared in an announcement in the local newspaper, would be devoted to the question of "the social, civil, and religious condition and rights of women." That convention became known as the Seneca Falls Convention, and it set into motion the organized American women's rights movement. (2001 p. 8)

Despite the success of Seneca Falls the convention also reflected the societal issues of its time. Although the organizers insisted their fight was for the rights of all women, what they actually meant was the rights of women like themselves "white, educated, and affluent" (Sigerman, 2001 p. 98). In an issue of *Revolution* Elizabeth Cady Stanton stated:

If you do not wish the lower orders of Chinese, Africans, Germans, and Irish, with their low ideas of womanhood to make laws for you and your daughters, . . . to dictate not only the civil, but moral codes by which you shall be governed, awake to the danger of your present position and demand that woman, too, shall be represented in the government. (Sigerman, 2001 pp. 98-99)

Stanton's remarks in *the Revolution* emphasized the intersectional complexities within the movement because the unjustness of denying women access to the ballot was fought with the unjustness of racism and xenophobia. The racial and xenophobic biases intertwined with and hindered the progress of the suffrage movement (Sigerman, 2001 pp. 98-99). As a result, the United States lagged behind twenty-six other nations in granting women the right to vote, ultimately challenging the traditional notion of the Divine Right of Men to govern only in 1920 (Catt and Shuler, 2020 Chapter 1).

While the Seneca Falls Convention marked a significant milestone in the women's rights movement, it also revealed the complexities and challenges inherent in the fight for equality. The legacy of this convention serves as a reminder of the ongoing struggles for women's rights, highlighting the need for inclusivity and intersectionality in feminist movements.

SECOND WAVE FEMINISM

The second wave of feminism, often referred to as the Women's Liberation Movement, emerged in the 1960s and extended into the 1990s, focused predominantly on addressing cultural inequalities. This period witnessed a significant shift as women increasingly spoke out against patriarchy, sexism, and various forms of oppression and discrimination in both private and public spheres. Concurrently, the rise of women's studies programs in universities highlighted women's concerns regarding their lack of representation in academic discourse and scholarship (Crouch, 2012, pp. 16–17).

While the first wave mainly consisted of white and middle-class women, the second wave aimed "to build a more inclusive and transformative movement" and proposed to broaden the concept of equality (Hewitt, 2012 p. 661). It aimed to be, as Hewitt noted, "more inclusive," yet, it ended to be criticized by marginalized groups of black women and lesbians for its exclusionary politics (Krolokke and Scott Sorenson, 2006 pp. 12-13). Despite these

challenges, the second wave marked a significant period in feminist history, sparking important dialogues and actions that contributed to reshaping societal views on gender equality and women's rights.

One of the main interactions of second wave feminists was with what Betty Friedan called “the problem that has no name” (1963 p. 15). Betty Friedan's publication of *The Feminine Mystique* in 1963 marked a pivotal moment in the feminist movement. Based on her survey of women who stayed at home, Friedan argued that women were dissatisfied with traditional roles of child-rearing and homemaking, feeling intellectually stifled within their domestic confines. This groundbreaking work is credited with catalyzing the second wave of feminism by prompting a reexamination of societal expectations regarding womanhood. Friedan's book challenged conventional representations of women and encouraged resistance to traditional gender roles (Whelehan, 2000, p. 5).

However, it is important to note that Friedan's book primarily resonated with white, college-educated, middle-class women, failing to fully acknowledge the experiences of those most marginalized by sexist oppression. As bell hooks pointed out in Feminist Theory: From Margin to Center, Friedan's work overlooked the struggles of women who faced daily physical, mental, and spiritual oppression and who lacked the agency to change their circumstances (hooks, 1984 p. 1). This critique was essential in urging feminists to broaden their focus beyond the experiences of white middle-class women and recognize the diverse challenges faced by all women.

The literature on the second wave standardizes the movement as white, but Benita Roth opts to conceptualize this wave as plural and diverse (Hewitt, 2012 p. 661; Roth, 2012 pp. 2-3). This approach is significant for this research because, as I argue, there is no single-sided story or experience regarding feminism.

In her book, *Separate Roads to Feminism*, Roth uses the plural form to describe feminist protests because the mobilizations of the 1960s and 1970s were diverse, characterized by racial and ethnic distinctions rather than conforming to a singular, “’whitewashed’ vision of the movement” (Roth, 2012 p. 2). Roth identifies two significant intramovements within this pluralistic context: Black feminism, which emerged from the Civil Rights and Black Liberation movements, and Chicana Feministas, rooted in Chicano and labor movements (Roth, 2012 pp. 76, 129). Black feminists focused on issues such as poor housing and advocated for educational freedom (Roth, 2012 p. 87). Maryanne Weathers argued that “forming a Black women’s movement was the correct strategy for building an all-inclusionary movement that would liberate men, women, and children, a ‘pro-human for all peoples’” (qtd. in Roth, 2012 p. 92).

Chicana feminists, on the other hand, sought to reorganize the family around the needs of racial and ethnic struggles. They emphasized the historical and cultural precedents for Mexican American women's political activism and addressed the absence of Mexican American universities, highlighting the underrepresentation of Chicanas and Chicanos compared to whites (Roth, 2012 p. 132).

THIRD WAVE FEMINISM

Third Wave Feminism emerged in the late 20th century as a response to and a critique of the second wave feminist movement. While second wave feminists viewed themselves as building upon the foundations laid by their predecessors (Bailey, 1997 p. 19), third wavers saw themselves as distinct from and often in opposition to the values of the second wave (Bailey, 1997 pp. 20-26). This divergence stemmed partly from the perception that the second wave was overly focused on "political correctness," a term that many third wave feminists rejected (Bailey, 1997 p. 22).

Despite this, some feminists seemed to embrace the term “third wave” because it put them “in the grander context of the women’s movement” (Bailey, 1997 p. 27). For instance, Rebecca Walker talked about the third wave in her article “Becoming the Third Wave,” published in 1992, and founded the Third Wave Foundation with the mission to “politicize and organize young women from diverse cultural and economic backgrounds” (qtd. in Bronstein, 2005 p. 784). Similarly, by adopting Friedan’s “‘religion’ of domesticity” in *The Beauty Myth*, Naomi Wolf declared that if women want to be heard “as [they] deserve to be heard—[they] will need no less than a feminist third wave” (2001, pp. 66; 274).

Likewise, previous feminist generations, the third wave, included different perspectives and focused on different practices. The exact historical boundary for the beginning of the third wave is not consensual but is assumed to wave emerged in the 1990s to later last until the early teens of the twenty century (Evans, 2015 p. 38). As the culture of comparing's legacy dictates, this wave assumes a "greater emphasis on inclusion and diversity" than the previous waves and claims to be more associated with politics of identity and intersectionality (Evans, 2015 p. 22).

Being one of the forerunners of this wave, Judith Butler highlights the interrelation of identity with sex and gender performativity. According to Butler, gender is always "a kind of becoming or activity [...] an incessant and repeated action of some sort" (1999, p. 143). She suggests that for one to become a "subject," they should be "gendered in conformity with recognizable standards of gender intelligibility" (1999, p. 22). Intelligibility is linked to performing gender coherence, meaning that only through the repetition of gendered stylized acts can a body become a subject (Butler, 1993, p. 95). This theory was significant for the third wave because it rejected gender binarism and made space for queer politics that could not be found in the previous movements.

The third wave is also associated with the concept of postfeminism, which Rosalind Gill characterizes as a highly contradictory "sensibility" composed of several interconnected themes (2007, p. 147). These themes include an increased emphasis on self-surveillance, self-discipline, neoliberal individualism, choice, empowerment, and a resurgence of ideas about sexual difference (Gill, 2007 p. 147). Postfeminism is occasionally viewed as a reaction or a backlash to feminism (Faludi, 1992 p. 11). On the other hand, McRobbie offers a more nuanced analysis of postfeminism, highlighting its tendency to entangle feminist and anti-feminist ideas (2004, p. 262).

THE WAVE METAPHOR: REDUCTIVE POLITICS OR FUNCTIONAL TOOL?

Looking at the various waves of feminism that I have discussed in the previous subheadings, it can be noticed that they are entangled in women's rights, civil rights, and social justice movements. Irrespective of their occurring period, what has collectively characterized these waves, is their appeals for equality and equity. While they share similar goals, the generational divide into waves is problematized by many scholars.

In their article, "Is it Time to Jump Ship?", Kathleen A. Laughlin et al. question the reasons behind the ubiquitous wave metaphor persisting in being "the dominant conceptual framework for analyzing and explaining the genesis" of women's rights movements (2010 p. 76). Given the plurality of the US feminist movements, pinpointing specific political ideas and campaigns to a particular wave is controversial. Numerous feminist scholars assert that the wave metaphor is inapplicable and fallacious on three premises.

First, it creates specific stereotypes and compels future feminist generations to use them in articulating how their feminism is unique and more significant, and this issue leads to false distinctions and boundaries between generations of feminists (Faludi, 2010 pp. 30-32). Second, it trivializes the complexity of feminism and leaves the illusion that the movement does not continue seamlessly (Hewitt, 2012 p. 661). Last, its narratives universalize the experiences of mainstream actors as only facilitators diminishing the efforts of long-running feminist struggles that were not as loud as the mainstream ones (Rivers, 2017 p. 21). Notwithstanding these issues, the historical overviews of feminist movements rely on this specific metaphor.

While discussing each wave separately in the history of feminism is perceived to be "both a reductive and distinctly narrow depiction of the feminist movement," there are a few positive approaches that I would like to employ (Rivers, 2017 p. 31).

Chamberlain points out that a wave is not a declaration of new ideas but "rather, it is the acknowledgment of an affectively intense period of feminist activism" (2017, p. 9). Nancy A. Hewitt believes that to understand this wave concept, it is crucial "to think about other types of waves, such as radio waves" rather than only ocean waves (2010 p. 10). She reasons that radio waves provide modes of communication "that allow previous struggles to resonate across time and space" (2010 p. 10). Radio waves are used by human beings to send and receive messages, and it does not matter whether those messages are different from those before. What is essential is how they have been communicated and how that mode has made it possible for a large group of people to

participate in a social movement. This argument is followed by the example of how radio waves were responsible for politicizing hundreds of thousands of women to come together and exercise their right to vote; as it was broadcasted on the radio, Hewitt states:

Radio waves were all the rage in 1920, and November 2 of that year also marked the first commercial broadcast when Pittsburgh station KDKA announced election returns in the presidential contest over a 100-watt transmitter. (2012 p. 658)

Moreover, radio frequencies are based on the size of the wave that carries the signal, and "[h]igher frequency short waves work better for transmission over long distances," while "lower frequency long waves are more effective for transmission within cities, regions, or states" (2012 p. 660). Therefore, if we think of feminist movements as being composed of both short and long waves, then it is possible to significantly expand the richness and complexity of each phase of feminism (Hewitt, 2012 p. 661). For instance, frequencies can be synonymous with feminisms, and if multiple frequencies exist all at once, so can diverse feminisms coexist. If multiple wavelengths can reach different distances, so can feminisms go both in time and in the distance. Hewitt also concedes that, despite its problems, the wave metaphor is firmly entrenched in the popular imaginary and suggests the need to "recast the concept of waves itself in order the recognize the multiple and conflicting elements that comprise particular periods of activism" (2012 p. 659).

This more nuanced analogy can be taken as an analytical tool to explore the intricacies of fourth wave feminism. For instance, it is essential to note that the idea of a generational break is arbitrary and that each wave, in reality, encompasses multiple generations of feminists. Those who were young and active in the second wave are still presumably engaged with feminist politics in this fourth wave because one does not just stop being a feminist at a certain age. Further, suggesting a recasting of the waves, Chamberlain proposes that they can be "untethered from feminist identity" and instead "associated with the socio-political and technological contexts in which they arise" (2017 p. 460). Even more, if we engage with this idea, the fourth wave of feminism can be seen as a multiplicity of technological socio-political practices. Hence the variety of digital platforms through which diverse feminist practices can be performed.

A FOURTH WAVE ARISES

The first anticipations of a new wave arising in sight can be found in Ann Kaplan's article published in 2003, where she discusses the necessity of conceptualizing a new feminist wave "in the wake of 9/11" (p. 52). She writes:

[T]he fourth wave will be distinguished by bringing second and third wave feminists together to confront a new and devastating reality that involves us all, if not equally, then at least at once. This new reality ideally cuts across racial, ethnic, and national divides. (2003, p. 55)

Her appeal for a new wave was not because she saw the prior waves as ineffective but because 9/11 would change all the knowledge produced so far (Kaplan, 2003 p.52). While Kaplan did not theorize or elaborate on the characteristics of the new wave, she did estimate that men and international feminisms would come together in response to terrorism (2003, pp. 54-55).

In her book, *The Feminist Fourth Wave: Affective Temporality*, Prudence Chamberlain argues that two fortunate events led the fourth wave of feminism to reach such popularity. First, the rise of journalism, and second the development in technology, as these both facilitated a "call-out culture" to be born in the form of digital politics (Chamberlain, 2017 p. 3). This call-out culture not only aided a constant "challenging of sexism and misogyny," but it also created "an environment in which feminism [could] directly engage with that which it is against" (Chamberlain, 2017 p. 3).

DEBATES

Even though Abigail de Kosnik finds social media to be synonymic with Xerox and indicates that it is the internet that allowed "everybody to be a publisher" and hence the fourth wave can be celebrated in its power to speak up, not all feminist theorists approached this new digital era with optimism (2019 p. 26).

Andi Zeisler argued that a feminism that would trade on "you go girl tweets and Instagram photos, cheery magazine editorials about dressing to please yourself" attracted skeptical gazes (2016, p. xv). She saw the fourth wave with a sort of selling out feminism where "gender equality has transmogrified from a collective goal to a consumer brand" (2016, p. xv).

Considering the Western political landscape, Alison Phipps suggests that "feminism has not been immune to the coercive and co-opting influence of the neoliberal and capitalist ideologies" (qtd. in Rivers, 2017 p. 19). It is not just fourth wave feminism but also third wave forms of feminism that has "been seduced by the marked," (qtd. in Rivers 2017 p.19).

Another debate around the fourth wave was its use of the wave metaphor. As I discussed in the previous subheadings, the issue is partly because the wave metaphor frequently fails to include all of the voices that have contributed to feminism over the years and partly because the movement's chronological organization diminishes the significance of specific periods and groups. However, if perceived as a resemblance to radio waves, as Hewitt suggested, the wave metaphor becomes versatile and can be adapted to new frequencies (2012 pp. 660-661).

Nevertheless, some scholars were still skeptical about the new wave's agenda and its adoption of the controversial metaphor, and Chamberlain counteracted this hesitation as fear of "natural growth or development" because by embracing the metaphor, the aim was not to attempt an interpellation that would fixate the meaning of the wave, instead, it would allow "for the activism to develop more organically" (Dean and Aune, 2015, p. 381; Chamberlain, 2017 p. 1). On the other hand, some recognized the freshening of the feminist activity but preferred to see it as a continuation of the third wave (Dean and Aune, 2015). To which Chamberlain responded with the oceanic wave metaphor and said that it does not necessarily signify division; instead, they "all interact in slightly different ways with the shore against which they crash" and "also work in succession and are continual, even if the tide pattern is subject to change" (2017, p. 30).

Others maintained that there is "no uniting focus" in social media activism that "online activism is not always regarded in a positive way" (Blevin, 2018 p. 97). For this reason, these online practices may get derogative terms like "slacktivism" or "arm-chair activism," all leading to questions about whether this internet activism of the fourth wave enacts any change (Tindall and Groenewegen qtd. in Blevin, 2018 p. 97). Even if there is no supporting research to answer if the internet has promoted feminist politics, "it is increasingly clear that [it] has facilitated the creation of a global community of feminists who use the internet both for discussion and activism" (Munro, 2013).

Similar debates against feminist practices have always been present regardless of the wave number they were opposing. The fourth wave is significant because it offers new ways and spaces of interaction. The fourth wave of feminism brings perhaps the most diverse practices as it blends all the agendas of the previous waves and collects them into a more accessible and widespread space, the internet.

CHARACTERISTICS

The fourth wave of feminism was not theorized until later in the 2010s due to the rise of online activism and its heavy reliance on social media and digital technology (Cochrane, 2013 ch. 1). Its medium, the internet, is the most distinctive feature, and when interconnected to its hashtagging feature, argues Susana Loza (2014), it takes a redefining significance in reshaping feminist activism (Bates, 2014 ch. 1; Rivers, 2017 p. 107). In her book, *All the Rebel Women*, Kira Cochrane argues that the internet "transformed the circulation of feminist ideas," and if once feminist writings were kept away in libraries, now "they moved away from the margins into the mainstream," creating virtual spaces for education (2012 ch. 4).

Furthermore, hashtagging activism proved to be crucial, points Sandoval, as it helped to form "coalitions across profound cultural, racial, class, sex, and power difference (qtd. in Loza, 2014). Kaplan already argued back in 2003 that the new wave will need to be racial and ethnic inclusive to address the racial injustices (2003, p. 50). She also talked about international feminism, and according to Parry et al., technology and digital media use have enabled global feminist discussion resulting in the discovery of parallels that might spark global movements (2003, p. 5).

CONSUMER APPROACH

Characterized by increased consumer-producer interaction via social media, the fourth wave of feminism, I opine, is more than just a continuation of its postfeminist predecessor. While critics have posed that postfeminism is nothing else than a commodified feminism "via the figure of woman as empowered customer," labeling the fourth wave with these pre-existing concepts is debatable (Tasker and Negra, 2007 p. 2). Despite each wave being influenced by the precedent ones, I think this approach misses some of the important new political work in feminism right now.

Although the fourth wave looks back at postfeminism, its aim is not to borrow the consumerist practices for which postfeminism's popularity has been hailed, as Tasker and Negra have suggested (2007, pp. 2-4). Instead, what it aims to do is to create new spaces of representation. Harriet Kimble Wrye opines that what the fourth wave succeeded in doing in terms of materialism is the "turn from concerns about 'me' to concern for the planet and all its beings" (2009, p. 187).

Nicola Rivers notices a vast interest in feminist public practices in popular culture, especially among celebrities who broaden the postfeminist ideals such as "the seductive notions of 'choice,' 'empowerment,' and 'agency'" (2017 p. 24). Furthermore, to demonstrate her thought she alludes to celebrities like Beyoncé, Taylor Swift, and Miley Cyrus, saying:

[T]he fourth wave championing of feminism in popular culture through music megastars […], also navigates a complicated path between postfeminism(s), relying on promoting the achievements (and frequently the lifestyle) of successful women, whilst also demanding that all women be elevated to—or more worryingly, emulate—this individualized, neoliberal, and capitalist vision of 'success.' (Rivers, 2017 p. 25)

Nonetheless, while these are useful examples of feminist practices, they are also driven by capitalist quests. Besides promoting a sexualized woman image by equating this image with success and money, they also normalize specific discourses around what sells. Another issue with such cases, I opine, is the sameness that they produce. This sameness can lead then to the production of feminist knowledge within the digital culture that only seeks profit.

CONCLUSION

To revise, regardless of its forms, time, and advocators, all forms of feminism and their practices are vital. During the first wave, feminists gained a political voice; throughout the second wave, they learned to question norms; in the third wave, they subverted binary notions and terms; and in the current wave, they understood the significance of more accessible activist spaces.

Regardless of their complex and contradictory nature, the current forms of feminisms and their practices are vital because through them, individual and collective changes take place. The internet and media affordances materialize empowerment and voices, and through them, new spaces of resistance are negotiated.

REFERENCES

Bailey, C. (1997). "Making waves and drawing lines: The politics of defining the vicissitudes of feminism." *Hypatia*, 12(3), 17–28.

Bates, L. (2014). *Everyday Sexism* [E-book]. Simon and Shuster.

Blevin, K. (2018). "bell hooks and consciousness raising: Argument for a fourth wave of feminism." In J. R. Vickery & T. Everbach (Eds.), *Mediating misogyny: Gender, technology, and harassment*. Palgrave Macmillan.

Bronstein, C. (2005). "Representing the third wave: Mainstream print media framing of a new feminist movement." *Journalism and Mass Communication Quarterly*, 82, 783–803.

Butler, J. (1999). Gender trouble: Feminism and the subversion of identity. Routledge.

Butler, J. (1993). Bodies that matter: On the discursive limits of sex. Routledge.

Chapman Catt, C., & Rogers Shuler, N. (2020). Woman suffrage and politics: The inner story of the suffrage movement [E-book]. Dover Publications.

Chamberlain, P. (2017). *The feminist fourth wave: Affective temporality*. Palgrave Macmillan.

Cochrane, K. (2013). *All the rebel women: The rise of the fourth wave of feminism* [E-book]. Guardian Shorts.

Crouch, B. (2012). "Finding a voice in the academy: The history of women's studies in higher education." *The Vermont Connection*, 33.

Dean, J., & Aune, K. (2015). "Feminism resurgent? Mapping contemporary feminist activisms in Europe." *Social Movement Studies,* 14(4), 375–395.

De Kosnik, A. (2019). "Is Twitter a stage." In A. De Kosnik & P. K. Feldman (Eds.), *#identity hashtagging: Race, gender, sexuality, and nation.* University of Michigan Press.

Dixon, K. (2014). "Feminist online identity: Analyzing the presence of hashtag feminism." *Journal of Arts and Humanities*, 3, 34–40.

DuBois, E. C. (1998). *Woman's suffrage and women's rights.* New York University Press.

Evans, S. (2015). *The politics of third wave feminisms: Neoliberalism, intersectionality and the state in Britain and the US.* Palgrave Macmillan.

Faludi, S. (1992). *Backlash: The undeclared war against women*. Crown Publishing Group.

Faludi, S. (2010). "American Electra. Feminism's ritual matricide". *Harper's Magazine*.

Friedan, B. (1963). *The feminine mystique*. W.W. Norton and Company.

Gill, R. (2007). *Gender and the media.* Polity Press.

Hewitt, N. A. (2012). "Feminist frequencies: Regenerating the wave metaphor." *Feminist Studies,* 38(3), 658–680.

Hewitt, N. A. (Ed.). (2010). *No permanent wave: Recasting histories of US feminism*. Rutgers University Press.

hooks, b. (1984). *Feminist theory: From margin to center.* Routledge.

Kaplan, A. E. (2003). "Feminist futures: Trauma, the post-9/11 world and a fourth feminism?" *Journal of International Women's Studies*, 4(2), 46–59.

Krolokke, C., & Scott Sorenson, A. (2006). *Gender communication theories and analyses: From silence to performance.* Sage Publications.

Laughlin, K. A., et al. (2010). "Is it time to jump ship? Historians rethink the waves metaphor." *Feminist Formations*, 22(1), 76–135.

Loza, S. (2014). "Hashtag feminism, #solidarityisforwhitewomen, and the other #femfuture." *Ada: A Journal of Gender, New Media, and Technology*, 5.

McRobbie, A. (2004). "Post-feminism and popular culture." *Feminist Media Studies,* 4(3), 255-64.

Munro, E. (2013). "Feminism: A fourth wave?" *Political Studies Association.* https://www.psa.ac.uk/psa/news/feminism-fourth-wave

Parry, D. C., et al. (2019). "Fourth wave feminism: Theoretical underpinnings and future directions for leisure research." In D. Parry (Ed.), *Feminisms in leisure studies: Advancing a fourth wave*. Routledge.

Rivers, N. (2017). *Postfeminism(s) and the arrival of the fourth wave: Turning tides*. Springer.

Roth, B. (2012). *Separate roads to feminism: Black, Chicana, and white feminist movements in America's second wave.* Cambridge University Press.

Sigerman, H. (2001). *Elizabeth Cady Stanton: The right is ours*. Oxford University Press.

Tasker, Y., & Negra, D. (2007). *Interrogating postfeminism: Gender and the politics of popular culture*. Duke University Press.

Whelehan, I. (1995). *Modern feminist thought: From the second wave to 'post-feminism'*. Edinburg University Press.

Wolf, N. (2001). *The beauty myth: How images of beauty are used against women*. Harper Collins.

Wrye, H. K. (2009). "The fourth wave of feminism: Psychoanalytic perspectives introductory remarks." *Studies in Gender and Sexuality,* 10(4), 185–189.

Zeisler, A. (2016). *We were feminists once: From riot grrrl to covergirl, the buying and selling of political movement.* Public Affairs.

CLASS, GENDER, AND CHOICE: UNPACKING ABORTION NARRATIVES IN *THE DECISION (10)*

MARINA FARIMA

Ph.D. Candidate, Eötvös Loránd University

ABSTRACT

This article delves into the abortion narratives of ten urban women portrayed in H. Can Utku's play, *The Decision (10)*. By employing a feminist analytical framework, the study aims to investigate the complex interplay of class and gender in shaping the characters' perspectives and choices regarding their abortion decision. Drawing upon Kimberlé Crenshaw's intersectionality theory and the third space feminist theories proposed by Chicana scholars Gloria Anzaldúa and Emma Pérez, the analysis exposes how patriarchal systems perpetuate oppression and delineate boundaries within societies. Additionally, the article scrutinizes the regulatory discourses surrounding abortion, revealing how they have created a third space for abortion-seeking women to exercise agency and enact oppositional practices, irrespective of their social class, race, ethnicity, religion, education, or political views. The study also examines the transformative potential of the gynecologist's office as a site of resistance, where women articulate narratives of resilience and defiance against patriarchal norms. Through their poignant monologues, the characters challenge societal expectations and advocate for reproductive rights that transcend socio-economic disparities. This analysis contributes to a nuanced understanding of gender dynamics, resistance strategies, and feminist activism within contemporary Turkish society, as depicted in the play *The Decision (10).*

Keywords: Intersectionality, Feminism, Abortion, Patriarchy, Resistance

INTRODUCTION

The Decision (10) (2014) written and directed by H. Can Utku for the 2014-2015 season, is a play that delves into the abortion narratives of ten urban women from Istanbul and how their freedoms and constraints are shaped by societal and cultural norms. The play consists of one act, ten scenes, and ten characters portrayed by five actresses. It unfolds place in a gynecologist's office, where a final year university student collects the stories of women who have opted for abortion. Each character presents a monologue, narrating their social lives, emotions, and thoughts surrounding their decision.

The Decision (10) is produced by a theatre group called *Öteki Hayatlar* (Other Lives). The roots of *Öteki Hayatlar* trace back to the late 1990s when students from Galatasaray University formed a theatre community, staging plays by *Other* playwrights such as Arthur Miller and Dario Fo. In 2005, former students decided to set up a theatre group. They called it *Öteki Hayatlar* as Zeynep Seda Aksoy, the assistant director and actress of *The Decision (10),* has stated: "Theatre means the others' lives" (Tiyatro Öteki Hayatlar, n.d.).

I have chosen to analyze this play for two main reasons. First, the discourses of the Justice and Development Party (JDP) government, which are anti-abortion and anti-choice, have significantly influenced the construction of social and cultural norms regulating individuals and institutions. Second, I am drawn to the feminist agenda of *Öteki Hayatlar*, which urges the audience to perceive reality through different lenses and review their preconceived cultural norms (Tiyatro Öteki Hayatlar, n.d.).

To examine how characters' abortion decisions are shaped by socio-economic, educational, and socio-cultural factors, I employ Kimberlé Crenshaw's theory of intersectionality (1989; 1991). Additionally, I draw upon the third space feminist theory of Chicana feminists (Anzaldúa, 1987; Pérez, 1999) to understand how patriarchal systems of oppression create boundaries among these women while also paving the way for a third space of resistance within Turkish society. Hence, the first subheading outlines the theoretical scholarship to elucidate on the interstitial location of abortion seeking individuals. The subsequent two sections discuss the regulatory schemes of the JDP government concerning abortion and examine socioeconomic class as a defining boundary. The final subheading illustrates how the gynecologist's office becomes a site where oppositional practices to the dominant anti-choice discourse are enacted. My overarching aim with this analysis is to illustrate how, despite the government's anti-abortionist discourse and the reterritorialized borders constructed by nationalism and patriarchy, women in Turkish society can establish a site of resistance where their autonomy is valued.

INTERSECTIONS OF BORDERS

Intersectionality serves as a foundational theoretical framework for this analysis, shedding light on the multifaceted nature of oppression and violence experienced by gendered bodies (Crenshaw, 1989; 1991). Coined by Kimberlé Crenshaw (1989; 1991), intersectionality delves into identity politics that often remains ignored in discussions about the nature of oppression, highlighting the interconnectedness of gender, class, ethnicity, race, religion, sexuality, and other identity markers. This interconnectedness underlines the complexity of oppression experienced by gendered individuals. With this analysis I employ intersectionality to examine how the characters in *The Decision* (2014) navigate and respond to societal expectations and norms regarding abortion.

While a plethora of identity categories could be explored, this study focuses primarily on gender and class struggles. The overlapping nature of these categories not only creates borders and barriers to accessing safe sexual and reproductive health services but also perpetuates instances of domestic violence and societal pressures, particularly concerning motherhood.

Furthermore, I frame Crenshaw's intersectionality theory as material feminism. Identity markers, often visible on the body (such as race, gender, class, and disability), make identity itself material. Consequently, the consequences of identity are also material. Intersectionality aids in negotiating the characters' borders and struggles in the play, contributing to the creation of a third space where dominant discourses and expectations are distorted.

Borders, traditionally defined as physical lines separating geographical spaces, take on a different meaning for Gloria Anzaldúa (1987). Anzaldúa views them as intersections where two cultures blend to form a third, a space where marginalized women resist oppression and where their invisibility becomes a positionality. Anzaldúa argues that women often internalize victimhood, and their ability to respond and counteract is taken away by their culture's discourses (1987, pp.20-21). In *Borderlands/La Frontera* (1987), Anzaldúa calls for a change and advocates for a space where these oppressive mechanisms are challenged. This borderland space is further developed by Emma Pérez in *The Decolonial Imaginary: Writing Chicanas into History* (1999), where Pérez introduces the concept of third space feminism. Here, hidden voices of silenced individuals are uncovered, and oppositional practices to political patriarchal discourses are enacted. This third space is akin to the gynecologist's office in *The Decision* (2014), where, through third space feminism, narrative strategies can unearth the experiences of the subjugated and give voice to their stories (Pérez, 1999).

THE REGULATORY SCHEME AROUND ABORTION

Turkey's experience with reproductive rights dates to 1983 when abortion became legal not only on health or medical grounds, as was the case previously, but "upon the request of individuals," regardless of whether the pregnancy was unwanted or unsafe (Gürsoy, 1996, p.535). While this legalization marked a significant step forward for reproductive health and rights, it has been criticized on several fronts. Turkish feminists have particularly criticized the law for being passed "without adequate public discussion" and for being perceived as a political population control tool rather than "a response to demands by women for reproductive freedom and control over their bodies" (Gürsoy, 1996, p.536). The law was passed as "The Law Concerning Population Planning" and it aimed to control the number of population rather than give the right over their own bodies to pregnant individuals (Gürsoy, 1996). Additionally, the law set the legal limit for pregnancy termination at 10 weeks and imposed requirements such as parental consent for minors and spouse consent for married individuals, further restricting access to abortion services (Gürsoy, 1996, p.536). These all led to this law to be seen as "giving legal sanction to conservative patriarchal values" (Gürsoy, 1996, p.536). However, the patriarchal control over abortion did not end there. In 2012, the anti-choice JDP government proposed a bill that would further restrict access to safe abortion. Although the bill did not pass, accessing abortion services in Turkey has become increasingly difficult since then (Karaca, 2013). Availability and accessibility of abortion services have been reduced not only in public hospitals but also in some private facilities that were financially supported by the JDP or its prominent leaders (MacFarlane et al., 2016, p.66).

For instance, in 2015, *Mor Çatı Sığınağı Vakfı* (Purple Roof Women's Shelter Foundation) contacted 37 public hospitals in Istanbul to inquire about abortion services. Out of which only 3 hospitals offered abortion upon request, 12 did not provide the service at all, 17 offered it only under specific conditions (such as fetal death or medical emergencies, with approval from the hospital's committee), 3 hospitals stated that such information could not be provided over the phone, and no definite information could be gotten from 2 hospitals (Mor Çatı, 2015). Alongside the difficulty of accessing abortion services, the cost of contraceptives and emergency pills has significantly increased. For example, the morning-after pill, *Ella*, which cost was 50.49 Turkish Lira in 2016, in 2020 costed 93.99 Turkish Lira (Türk İlaç Rehberi, 2020). These factors, coupled with reduced accessibility of abortion in public medical facilities, force individuals seeking abortion to turn to private hospitals and pay high fees. The increased cost of contraceptives acts as a significant barrier for individuals to exercise control over their reproductive health. Furthermore, the discourses surrounding abortion have a profound impact on societal and cultural norms. For the JDP's conservative politics, womanhood is equated with motherhood and wifely duties (Cindoğlu and Unal, 2017, p.42). Consequently, discourses emphasizing "traditional gender roles […], family unity and women's familial roles" are perpetually reproduced by JDP parliamentarians (Cindoğlu and Unal, 2017, p.42). These promote having three children, equating children with future economic success, controlling and concealing women's sexuality, and reinforcing women's roles as caretakers of elders and children (Acar and Altunok, 2013; Cindoğlu and Unal, 2017).

I have presented JDP's regulatory scheme around abortion and traditional gender roles to illustrate how patriarchal mechanisms persist in controlling women's rights and bodies. It also demonstrates the real-life impact of government discourses. Furthermore, besides regulating norms around abortion and gender roles, JDP's hegemonic gender politics create borders. Just as borders separate physical locations, they also divide cultures, social classes, and ideologies. In the following section, I primarily examine the socio-economic class to explore how it creates borders and struggles and how these manifests in the experiences of the characters in *The Decision (10)* (2014) by H. Can Utku. Finally, I analyze how these borders transform the gynecologist's office into a third space where social oppressions around abortion are distorted.

SOCIO-ECONOMIC STRUGGLES

> …five women dressed in black wait on the stage as music plays and the spectators enter. There are 5 black chairs arranged in a semi-circle next to which ten colorful headscarves lie neatly arranged on the floor…
>
> (Field notes, January 29th, 2020).

Picture a university student, fearful of society's gossip; a woman who cleans houses to feed her seven children; another over thirty, shamed for being unmarried, and yet another for being divorced; one criticized for not loving her husband and another for prioritizing her career. Picture a woman who endured rape by multiple men; another who sought to pursue her dreams in a big city to escape an unwanted marriage; one who left her country for love but fell victim to human trafficking. Lastly, picture a woman who longed to become a parent and faced continuous societal pressure to fulfill the norm of "motherhood" despite her infertility. What unites them? They are all women in a society where regulatory schemes impose pregnancy and motherhood as norms for their bodies to be deemed acceptable. These ten women are the characters in H. Can Utku's play, *The Decision (10)* (2014).

The characters in the play, portrayed interchangeably by five actresses, offer a poignant representation of diverse backgrounds and struggles within Turkish society. Among the various challenges depicted, social class emerges as a particularly salient border struggle, and this is visually materialized through how they occupy the stage. Sandra Bartky has argued that "[t]he production of 'docile bodies' requires that an uninterrupted coercion be directed to the very processes of bodily activity" (1997, p.26). This bodily activity includes "gesture, posture, movement, and general bodily comportment" (Bartky, 1997, p.29). To discipline women on how to dress, how to sit, and how to act, patriarchal discourses are perhaps the most effective (Foucault, 1995; Bartky, 1997). This dynamic is vividly portrayed in the play where the characters' experiences reflect the impact of societal expectations tied to social class but because these discourses also create the societal norms, those who get most affected are the subjects whose economic stability lacks balance. At least, this is how it is portrayed in *The Decision (10)* (2014).

Let's take for instance the second character, a middle-aged woman with seven children. Being the only breadwinner in the house because her "husband's attempts of finding a job are less than [her] children's number" (Utku, 2014), this character exhibits her working-class status in how she occupies space and how she wears the headscarf. Here I use the terms 'scarf' and 'headscarf' interchangeably in reference to the garment worn around the head, neck, or shoulders and it does not have any religious connotations. From the outset of the play, the audience is made aware that scarves will play a significant symbolic role throughout the performance. While the headscarf carries varying meanings in Turkish society, ranging from religious to political markers (Çınar, 2008), my focus here is not to attribute a definitive meaning to it. Rather, I aim to explore the metaphorical symbol it represents within the context of this play.

The specific way in which the second character wears her headscarf is notable. With her hair visible from the front, knotted at the back of the neck, and with long tips falling on her chest, this style reflects her Anatolian rural roots. While this manner of wearing the headscarf is common in rural areas and could be considered a traditional style in Turkey, it is also seen in large metropolitan cities. However, its significance differs in these

contexts. In rural areas, it is a casual, everyday style, while in urban settings, it can serve as a visual indicator of belonging to the working class.

Watching this character tell her story was enlightening on many levels. The acting transcended mere performance; as a spectator, I did not see an actress portraying a role, but rather a genuine embodiment of experiences, emotions, and life struggles, all materialized in body form. The years spent in domestic work without job security or social benefits were reflected in her body language: slumped shoulders, a sullen expression, and arms crossed defensively over her chest to mask insecurity, anxiety, stress, and fear. Bartky argues that "[w]omen are far more restricted than men in their manner of movement and in their lived spatiality" (1997, p.29). This character's body posture, with her legs tucked under the chair and occupying as least space as possible reflects the reality of many working-class women who engage in informal work to support their families.

However, besides lacking a job and social security, women belonging to the less disadvantaged class are less informed in contraceptive methods and even if they are with the significant growing cost in the past years, they cannot simply afford them (MacFarlane et al., 2016). The character says:

I heard about these pills from a woman whose house I am cleaning. I mean, I've heard about them here and there before but didn't know what they were for, and it didn't even come to my mind to ask. (Utku, 2014)

As already stated, social class divisions are reflected in the play through the characters' attire, how the scarf is worn, and through how they occupy the space. Next example is the character who, despite the passion for her career, had to leave it aside to become a mother. The sixth character, depicted as an educated woman from a middle or upper-middle-class, wears a blue scarf elegantly tied around her neck with a small knot on the left side. Bartky (1997) refers to Foucault (1995) to argue that the "body-object articulations" of a soldier and their weapon are closely linked to the production and regulation of women's femininity. Similarly, the sixth character's attire and her proper etiquette with a straight posture, chin up high, legs slightly bend on the side convey how her femininity has also been regulated by her social status.

Even though a distinction was pursued to be made by their scarf wearing and occupation of space, just as the second character with seven children antagonizes the patriarchal constructions by refusing to give birth to another child, so is the sixth character who states:

For years I have been missing so many things: meetings, invitations, conferences, my friends' parties, films, and concerts. The young person who was my assistant when I was writing my first book, nowadays is an associate professor, on top of it, he is a father of two. But he is a father, not a mother. (Utku, 2014)

The societal expectation to fulfill traditional roles within the family affects women deeply. Crenshaw (1989; 1991) discusses how social class intersects with gender identity, disproportionately perpetuating economic hardship, and societal expectations related to pregnancy. This systematic oppression related to socioeconomic class manifests differently for each character. The second character, a mother of seven, with nine births, three miscarriages, and a total of twelve pregnancies, faces judgment from the households where she works as a cleaner regarding why she continues to have children, despite her evident struggle to provide for them. In contrast, the educated middle or upper-middle-class woman is frowned upon for prioritizing her career over having more children. Hence, regardless of their social class, women are still affected by traditional gender norms. This is evident when the sixth character, despite her education and status, feels compelled to justify her decision to seek an abortion, highlighting the pervasive influence of societal expectations.

Crenshaw (1989; 1991) also discusses how gender and class intersect to impact agency and choice. Illustrated differently, the second character recounts a history marked by familial abandonment, recalling being hastily married off by her parents to the first man who proposed, as they were eager to get rid of her. In contrast, the educated and self-identified feminist, who had the privilege of choosing her partner, acknowledges the persistence of traditional gender roles in parenting despite efforts for equality within her family. She bemoans the unequal burden of parenthood, lamenting that, no matter how "equal" she and her partner may strive to be, the weight of parenthood disproportionately falls on her (Utku, 2014).

Traditionally, the responsibility of educating and raising children falls heavily on women, irrespective of their social class. This burden often hinders women's access to careers or desired jobs. Contemplating what her position in academia might have been had she not become a mother, she concludes, "I just can't do it again," alluding to her second pregnancy highlighting the challenges of balancing motherhood with career aspirations (Utku, 2014). On one side we have a weary, middle-aged woman, perhaps not even forty, whose shoulders sag from years of scrubbing brushes in others' bathrooms. On the other side we have a confident woman, her straight posture and neatly arranged dress reflecting a more privileged position. However, these contrasting images do not aim to perpetuate stereotypes but rather to highlight the intersectionality of gender and social class in shaping individuals' experiences.

Certainly, as Crenshaw (1989; 1991) elucidates, the intersection of social class with gender identity also amplifies the perpetuation of domestic violence. The narrative of the working-class character, disclosing her experiences of domestic violence during pregnancy, underscores the profound influence of social class on women's realities. She shares that she has faced physical violence due to her missing period. While the educated character does not face domestic violence, she still contends with psychological violence stemming from societal pressures and expectations regarding motherhood and family roles. Her narrative highlights the pervasive nature of these norms, even among those who may not experience violence directly.

Despite these differences, both women experience the materialization of pregnancy and motherhood demands imposed by the state and society. In Turkish society, possessing certain civic rights often hinges on fulfilling motherhood duties, as motherhood is deemed a primary responsibility for protecting the republic and its future (Tepe, 2017). These entrenched norms surrounding family values impact women across all social classes. Therefore, when the sixth character expresses her desire for an abortion, she experiences guilt and feels compelled to justify her decision, irrespective of her class, education, or societal status.

GYNECOLOGIST'S OFFICE – A SITE OF RESISTANCE

"…If my father hears that I am pregnant he will kill the both of us..."

(Field notes, January 29th, 2020).

As I have detailed in subheading The regulatory scheme around abortion, the political dialogues of JDP influenced hospitals' position in refusing abortion procedures. Although abortion in Turkey has been legal since 1983, safe access to abortion has decreased since 2012, when the JDP proposed an anti-abortion bill and party leader Recep Tayyip Erdoğan remarked that abortion is "murder" (Çelebi and Çabak, 2019). Similar anti-choice discourses were expressed by other JDP members, such as former Ankara mayor Melih Gökçek, who stated in a TV interview, "the mother should kill herself and not the baby, why would the baby be responsible for the mistake the mother did. […] The body is yours, […], but if you make an abortion, it is called murder" (Habertürk, 2012).

These demonizing discourses surrounding abortion have created a third space for abortion-seeking individuals. The gynecologist's office becomes this third space, where patriarchal discourses are collectively distorted (Anzaldúa, 1987). According to Pérez (1999), the third space is where women exercise agency and enact oppositional practices against dominant discourses. As argued in previous sections, experiences with safe sexual and reproductive health and access to contraceptives are closely tied to social class (MacFarlane et al., 2016). Consequently, the gynecologist's office becomes a third space that gathers women regardless of their class, education, ethnicity, religion, skin color, political views, or ideologies.

What distinguishes the play *The Decision* (2014) is the voiced lived experiences and struggles of different women. If socio-cultural factors such as education and class create borders among women seeking safe abortion services, the gynecologist's office offers them a space to resist social, cultural, and political discourses that marginalize them. This "in-between space" is a site of negotiation where women describe the systematic sexism they face from family, society, and political leaders (Pérez, 1999).

The first character, a third-year university student who left her city to study in Istanbul, sees being Istanbulian as a privilege. She expresses her concerns about societal judgments regarding abortion due to her traditional family background:

Are you from Istanbul? I mean, do your parents live in Istanbul? If that is the case, you probably think of me as old-fashioned. You probably think that getting an abortion is not a big deal in this era anymore. (Proceeds to give her reasons) But my family is traditional, what can I do? My father is very conservative. […] They (alluding to her own and her partner's parents) will say that 'she did it without being married', 'maybe she did it to be taken as a wife', 'and the one who today cheated on her father, tomorrow will cheat on her husband', but they won't say anything anymore, because we made our decision. (Utku, 2014)

The oppositional consciousness embraced by this character reflects her agency through which she communicates her strategies of survival. In her monologue she alludes to the border created between the more educated, privileged women born and raised in Istanbul and the ones who came to Istanbul from less disadvantaged backgrounds.

The second character, the working-class parent of seven children who migrated to Istanbul while she was a teenager, supports this belief saying:

I believed in destiny when we migrated to Istanbul. I was so excited by the belief that I won't rot in a village, because to be an urban person, to live in the biggest city where everyone could do whatever their heart desires, where they can become whatever, they want to become, what could be better than this, right? (Silence followed by a deep heavy breath) How dumber could be a child of sixteen years old? And then, I was given to the first man who asked my hand […] and begin Bedriye to give births (slipping her name through her lips). (Utku, 2014)

Despite the invisible borders created by social class and background in Istanbulian society, the gynecologist's office becomes a space where these borders are disrupted. As related by these two characters who belong to a more disadvantaged background in terms of either coming from a conservative family with patriarchal values, or having economic disadvantage, job and social insecurity, the threshold of gynecologist's door signifies the overthrown of the patriarchal discourse that a woman's duty is to become a mother (Tepe, 2017).

The transformative potential of the gynecologist's office lies in its stance of creating a space where women are listened to regardless of their social, cultural, religious, or political identities. For this reason, the interviewer is absent, the interviewer is silent to give a space and a voice to those who struggle with the dominant patriarchal discourses. The gynecologist's office becomes a site where these women describe their survival strategies into the systems of oppression. Where they share the ways of their personal and embodied resistance against the hegemonic mechanism of oppression

CONCLUSION

In conclusion, *The Decision (10)* by H. Can Utku provides a profound exploration of the intersectional dynamics of class and gender in the context of abortion narratives among urban women in Istanbul. Through the lens of feminist theory, particularly Kimberlé Crenshaw's intersectionality and the third space feminist theories of Gloria Anzaldúa and Emma Pérez, the play illuminates the complexities of societal norms and expectations that shape women's reproductive choices.

The play's characters embody a spectrum of experiences, reflecting the diverse socio-economic backgrounds and struggles faced by women in Turkish society. From the working-class woman supporting seven children to the educated professional navigating career aspirations and motherhood, each character's narrative reveals the intricate ways in which gender, class, and societal expectations intersect to influence their decisions regarding abortion.

The regulatory discourses surrounding abortion in Turkey, particularly those driven by the JDP government, further complicate the landscape, creating additional barriers for women seeking access to safe and legal

abortion services. Despite these challenges, the gynecologist's office emerges as a powerful site of resistance, where women can voice their experiences, challenge societal norms, and assert their agency over their bodies.

Overall, *The Decision (10)* offers a nuanced portrayal of gender dynamics, resistance strategies, and feminist activism within contemporary Turkish society. By highlighting the voices and narratives of women from diverse backgrounds, the play contributes to a deeper understanding of the complexities surrounding abortion and reproductive rights, advocating for a more inclusive and empathetic approach to these issues.

REFERENCES

Acar, F. and Altunok, G. 2013. 'The 'politics of intimate' at the intersection of neoliberalism and neo-conservatism in contemporary Turkey'. *Women's Studies International Forum*, 41, 14-23.

Anzaldúa, G. 1987. *Borderlands. La frontera: The new mestiza*. San Francisco: Aunt Lute Books.

Bartky, S. L. 1997. 'Foucault, femininity and the modernization of patriarchal power'. In: R. Weitz, ed. *The politics of women's bodies*. 1998. Oxford: Oxford University Press, 25-45.

Crenshaw, K. 1989 "Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics." *University of Chicago Legal Forum*, 139–67.

Crenshaw, K. 1991. "Mapping the Margins: Intersectionality, Identity, and Violence Against Women of Color." Stanford Law Review, 43(6), 1241–1300.

Çelebi, Z. and Çabak, B. 2019. 'Abortion: Legal but de facto prohibited'. *Bianet* (online) Availabe at: https://bianet.org/haber/abortion-legal-but-de-facto-prohibited-213200

Çınar, A. 2008. "Subversion and subjugation in the public sphere: Secularism and the Islamic headscarf." *Signs*, 33(4), 891-913.

Cindoğlu, D. and Ünal, D. 2017. "Gender and sexuality in the authoritarian discursive strategies of 'New Turkey." *European Journal of Women's Studies,* 24(1), 39–54.

Foucault, M. 1995. *Discipline and Punish: the birth of prison.* New York: Vintage Books.

Pérez, E. 1999. *The decolonial imaginary: Writing Chicanas into history*. Bloomington: Indiana University Press.

Gürsoy, A. 1996. "Abortion in Turkey: A matter of state, family or individual decision." *Social Science Medicine*. 42(4), 531-542.

Habertürk. 2012. "Çocuğun ne suçu var, anası Kendini Öldürsün!" [The mother should kill herself and not the baby, why would the baby be responsible for the mistake the mother did] Available at: https://www.haberturk.com/polemik/haber/747352-cocugun-ne-sucu-var-anasi-kendisini-oldursun-

Karaca, E. 2013. "Kürtaj yasada hak, hastanelerde yasak" [Abortion right present in the law, forbidden in hospitals]. *Bianet* (online) Availabe at: https://bianet.org/haber/kurtaj-yasada-hak-hastanelerde-yasak-146346

MacFarlane, K.A., O'neil, M.L., Tekdemir, D., Çetin, E., Bilgen, B., and Foster, A.M. 2016. "Politics, policies, pronatalism, and practice: Availability and accessibility of abortion and reproductive health services in Turkey." *Reproductive Health Matters* 24(48), 62-70.

Mor Çatı, 2015. "Kürtaj yapıyor musunuz? 'Hayır yapmıyoruz!'". [Do you do abortions? "No, we don't!"]. (online) Available at: https://morcati.org.tr/haberler/kurtaj-yapiyor-musunuz-hayir-yapmiyoruz/

Pérez, E. (1999). *The decolonial imaginary: Writing Chicanas into history*. Bloomington: Indiana University Press.

Tiyatro Öteki Hayatlar. No Date. "Hakkımızda" [About us]. (online) Available at: http://www.otekihayatlar.com/hakkimizda

Tepe, F. F. 2017. “Turkish mother citizens and their homefront duties: The cold war discourse of the *Türk Kadını* Magazine.” *Feminist Formations* 29(1), 25-52.

Türk İlaç Rehberi. 2020. “ELLA 30 mg film kaplı tablet (1 tablet) 2020 Fiyat Bilgileri.” [ELLA 30 mg film-coated tablet (1 tablet) 2020 Price Information]. (online) Available at: https://www.ilacrehberi.com/v/ella-30mg-tablet-e3c8/ilac-fiyati-2020/

Utku, H. Can. 2014. *The Decision (10)* [Karar (10)]. Performed by Tiyatro Öteki Hayatlar. Staged at Tatavla Sahnesi, January 29, 2020, Istanbul, Turkey.