

Research Article

A MONOGRAPH ON SPACE: KAHN ARCHITECTURE AND TURRELL INSTALLATION

Erkan AYDINTAN¹ , Selen Rumeysa ÜNLÜ² , Merve TÜRKKÖYLÜ³ , Seda YAZICI⁴ 

¹Department of Interior Architecture, Karadeniz Technical University, Trabzon, Türkiye, aydintan61@hotmail.com

²Department of Interior Architecture, Karadeniz Technical University, Trabzon, Türkiye, selenrunlu@gmail.com

³Department of Interior Architecture, Karadeniz Technical University, Trabzon, Türkiye, merturkkoylu@hotmail.com

⁴Interior Design Program, Avrasya University Vocational School, Trabzon, Türkiye, im.sedaaltuntas@gmail.com

Received: 18.12.2023, Received in Revised Form: 20.12.2023, Accepted: 09.01.2024, Available Online: 29.01.2024

Keywords

Space;
Architecture;
Installation Art;
Louis Kahn;
James Turrell

Abstract The way design disciplines and art look at space in terms of their reasonings and their perceptions shows similarities and differences between past and present. This is also true for architecture, that creates space, and installation art, that presents spatial narratives. In the readings, no study was found in which the concept of space was monographically handled in the context of its relationship with architecture and installation art and examined in depth with case analysis. From this point of view, the hypothesis that the multidimensionality of space can be read through the architecture of Louis Kahn and the installation of James Turrell was put forward and a monographic examination was carried out.

The study consists of determining the sample, research and analysis. The selection of the names in question was influenced by the fact that their ways of dealing with space can be read both through their own discourses and publications on their works, as well as the fact that they are award winners. Theses, scientific research papers, artistic criticism texts, book/book chapters, interviews and biography documentaries were used as research material. In the examinations made by content analysis, firstly, the concepts expressing the architect and artist's view of space were determined. Then, common and different concepts in both fields were ranked according to their frequency of use. Thus, representing Louis Kahn and James Turrell's approaches to space with the concepts frequently encountered in the literature and illustrating them has been adopted as the method of the study.

* Corresponding author.

E-mail address: selenrunlu@gmail.com (KTU).

Introduction

Many disciplines are closely related and mutually enrich each other. The discipline of architecture and installation art, through the medium of art, share a strong connection. Architecture is expressed as an art form that creates spaces facilitating the realization of actions with aesthetic and functional value, making life easier, and responding to the totality of requirements (Köse, 2016, pp. 50-51). The idea that art is an aesthetic phenomenon and architecture strives to create space within this phenomenon expresses commonalities in the relationship between art and architecture (Erzen, 1976, p. 182). In this context, it can be argued that artistic value is inherent in architecture and is one of the elements influencing the architectural value of a structure (Erbay, Zorlu, Akgül, Onur, & Aras, 2013, pp. 29-30). Architecture is also a form of expression; it carries a communicative function and possesses cultural significance (Hasol, 2017, p. 12). Architecture serves as a bridge in the transmission of the arts of cultures and civilizations (Uçar, 2011, p. 43).

Installation, which has become a significant part of contemporary art, is a mode of production, expression, and a philosophy of art (Taştan, 2018, p. 49). Among various art forms, installation art is the most potent in addressing and creating space, specific to a particular location, examining and utilizing the qualities of that space, and emphasizing interaction with the viewer (Yerce, 2007, p. 7). Through its experiential and questioning approach for the viewer, installation art brings together art and space, transcending its own boundaries and integrating with the given space (Taşkaya, 2022, pp. 10-11). Both the discipline of architecture and installation art, due to their structure and existential purpose, cannot be expressed independently of space; however, they use space and have the ability to create new spaces. In this context, it can be stated that installation art is associated with the discipline of architecture. Nevertheless, while the motivation for creating space in the discipline of architecture is based on human physical and psychological needs, in installation art, this motivation is related to emotional expression (Kaya & Sağsöz, 2022, p. 3). In installation art, like in architecture, the artwork creates a living space in a given area; however, the treated space, unlike architecture, generates a different visual impact on the viewer through placement in terms of meaning and expression (Yerce, 2007, p. 33). In summary, installation artworks themselves can define spaces where the viewer can immerse and move within.

At this point, the concept of space reveals the points at which the two fields converge and diverge. In other words, the space that shapes both the discipline of architecture and installation art encompasses similarities and differences in terms of their reasons for existence, perception, and utilization. Within this framework, it is believed that highlighting the unifying and differentiating features of the concept of space simultaneously in both the discipline of architecture and installation art contributes to the depth of studies in this area.

In line with this purpose, the study initially examines existing works on the concepts of space in architecture and art. For instance, Usta (2020, p. 25) has conducted a study discussing the concept of space, exploring its definitions from different perspectives, and opening a debate on the concepts of space and place. Demir (2019, p. 1) has focused on the phenomenon of

space, examining its connections with installation art and the interior spaces they construct from a design perspective, aiming to identify the characteristics that define installation art. Üngür (2011, p. 2) has sought to map the thoughts produced and debated throughout history in various fields such as physics, philosophy, social sciences, and aesthetics related to the concept of space within the scope of the discipline of architecture.

Numerous studies also address the combination of art and space. Toluyağ (2020, p. 101) analyzes the relationships between installation practices and exhibition spaces from a spatial perspective through object analyses. In another study, the works of Do Ho Suh are examined, and the representations of space in these works are analyzed, questioning the impact created by the absence of space (Balaban & Varol, 2022, p. 499). Despite these readings, no study has been found that investigates the relationship between the concept of space and the disciplines of architecture and installation art through case analysis, hence the aim of this study is to contribute to filling this gap in the literature.

In this study, the relationships between the discipline of architecture and installation art with space are mutually questioned, and they are evaluated in relation to each other. This approach also points to the originality of the research. With such a perspective, the hypothesis is put forward that the multidimensional nature of the concept of space can have different reflections, and it can be read through a case study of Louis Kahn's architecture and James Turrell's installation. In summary, the study aims to reveal the similarities and differences in the perspectives of installation art and the discipline of architecture regarding space.

Methodology

The study consists of determining the sample and the steps of research and analysis. In this context, the approaches of the selected designer and artist towards the space have been examined through written and visual sources.

In the conducted study, which employed the inductive method, qualitative research methods were utilized. The preference for the inductive method in the study is primarily due to the significance of having the relationships identified in research methods supported by certain events. Although the study has a descriptive characteristic in terms of causality, it has an analytical research quality in terms of its purpose. Analytical research primarily aims to present a new perspective or suggestion on a subject (Seyidoğlu, 2020, p. 39).

In the study, the concept of space, common in both the discipline of architecture and installation art, is examined through a selected sample group to understand its interpretation in these fields. Subsequently, the perspectives of the chosen designer and artist, representing their respective fields, are compared regarding their approach to space. Within this framework, the similarities and differences in the understanding of space in the works of Louis Kahn and James Turrell are key questions addressed in the research.

The selection of the mentioned figures was influenced by various reasons during the process. The ability to interpret their approaches to space through their own discourses and publications about their works was a fundamental factor in choosing these names. Additionally, the dimension, significance, and differentiation of the relationship that Kahn and Turrell establish

with space from others played a role in this selection. Kahn, perceiving architecture as an art and approaching space emotionally, intuitively, and philosophically, contrasts with Turrell's similar emotional, philosophical, and perceptual questioning of space, distinguishing the two figures in their approach to space (Bilir, 2019, pp. 50-51; Mulla, 2019, pp. 8-9; URL 2). Their distinctive characteristics contribute to providing broader and more original perspectives on space in the monographic study, thus enhancing the research. Furthermore, the abundance of sources about them, their established presence in the literature, and their numerous awards in their respective fields are additional factors considered in the selection process.

With this perspective, the selection of Louis Kahn for the discipline of design is influenced by several factors. Kahn's selection is based on the abundance of biographical documentaries, such as *"My Architect: A Son's Journey"* and numerous awards, including the AIA Gold Medal, Royal Gold Medal, and Twenty-Five Year Award (URL 1, URL 2). The extensive body of work about him, including publications, conferences, articles, and critical essays, is also a decisive factor in this decision. The exhibition "A New/Second Look at Louis Kahn: Photographs - Drawings and Paintings by Cemal Emden (2017-2018)" highlights Kahn's importance as a key figure in 20th-century global architecture, recognizing him as a thinker, artist, and "architecture guru," focusing on his significant structures and artistic works (URL 3). Additionally, Kahn's prominence in 20th-century architecture, inspiring contemporary architects like Tadao Ando, Moshe Safdie, Mario Botta, Renzo Piano, and Norman Foster, as well as the publication of his book "Louis Kahn: Silence and Light" contribute to his selection (Rabifard, 2011, p. 161).

In the realm of art, the selection of James Turrell is influenced by various factors. Turrell is acknowledged in the book "Arts of Wonder" as one of the most exciting artists working at the end of the 20th century and the beginning of the 21st century, as recognized by many art enthusiasts and critics (Zöngür & Uluçay, 2020, p. 3934). The existence of published books, articles, and papers about him also played a role. Turrell's numerous art pieces, interviews, and the availability of information from internet sources are additional factors in this decision. Furthermore, Turrell's receipt of the National Medal of Arts (URL 4) and his diverse educational background in mathematics, perceptual psychology, and astronomy (Atalay & Baba, 2021, p. 907; Daşkesen, 2022, p. 98) suggest a strong foundation supporting his artistic production, contributing to his selection.

In the research process of the study, the data collection method involved document analysis through various literature sources, including books, articles, papers, biographies, interviews, and internet sources written by individuals or institutions on the subject. Visual analyses of the works of the selected designer and artist, constituting the sample group, were also part of the document analysis. In this context, the perspectives on space and approaches to space by these figures were examined by creating a sample from literature sources, and content analyses were conducted based on these sources.

The research utilized purposive sampling methods within the document analysis, as the aim was to obtain the best information related to the research problem (Creswell, 2021, p. 149). Maximum diversity sampling, a purposive sampling method, was specifically chosen to ensure a variety of perspectives rather than aiming for generalization. This sampling method allows

for the analysis of situations that are thought to contain rich information, often referred to as purposeful or criterion sampling (Goetz & LeCompte, 1984; as cited in Yıldırım & Şimşek, 2008, p. 107).

In the analysis phase of the study, a rich source of information compiled through purposive sampling was used to elucidate the design philosophies of Louis Kahn and James Turrell. The sources included theses, scientific research papers, art critique texts, books/book chapters, interviews, conferences, and biographical documentaries. In total, 58 different sources were examined during the process, and the analyses were completed where data redundancy occurred. Among these, 2 papers, 8 articles, 8 theses, 5 internet sources, 3 documentaries, 1 conference, and 1 interview were included in the analysis. The data were initially coded from the texts based on the nature of content analysis, identifying recurring concepts in expressing the architect and artist's perspectives on space. These concepts were then ranked according to their frequency. The identified concepts expressing similarities and differences were classified as 1st-degree and 2nd-degree, respectively (Figure 1). The design philosophies and perspectives on space of the architect and artist were first explained through 1st-degree similarities, supported by visuals. Examples were selected by considering their frequent association with the discussed concepts in the literature. Subsequently, the design and spatial perspectives of Kahn and Turrell were examined through 1st-degree differences.

In summary, the study consists of "Preparation" and "Review" processes. In the Preparation process, a literature review was conducted, and sources were compiled. The Examination process involved scrutinizing the perspectives on space of the selected individuals through purposeful sampling and the maximum diversity sampling suggestion, using the identified sources and selected works (Table 1).

Table 1. Stages of the Study.

Preparation Process		Review Process		
<ul style="list-style-type: none"> • Identification of Research Question and Formulation of Hypothesis • Literature Review • Selection of Figures Representing the Discipline of Architecture and Installation Art • Purposeful Sampling and Maximum Diversity Sampling in Source Selection 	<ul style="list-style-type: none"> • Identification of Concepts Expressed in the Literature through Document Analysis • Identification of Prominent Concepts in the Works of Louis Kahn and James Turrell • Identification and Hierarchization of Similarities and Differences 	<ul style="list-style-type: none"> • Inference Based on Identified Fundamental Concepts • Illustration of Works Demonstrating the Representational Capability of First-Degree Similarities 	<ul style="list-style-type: none"> • Expression of the Spatial Concept through the Perspectives and Design Philosophies of Kahn and Turrell 	
Introduction	Research	Analysis	Findings and Discussion	Conclusion
Exploration of the Concept of Space in the Discipline of Architecture and Installation Art	Gathering Information on the Design Philosophies and Perspectives on Space of Kahn and Turrell	Determining Concepts Expressing Kahn and Turrell's Design Philosophies and Perspectives on Space, Addressing Fundamental Similarities and Differences	Discussing First-Degree Similarities and Differences Within the Considered Concepts	Expression of the Spatial Concept's Position in Various Disciplines

Findings and Discussion

The General Characteristics of Louis Kahn's Architecture and James Turrell's Installations

According to Kahn, who considers architecture as a spatial art, a space should possess a philosophy that resonates with the human spirit and existence. When a structure is built, it simultaneously establishes a way of life. Kahn emphasizes that the life instilled in his structures interacts with people; therefore, approaching a space merely functionally would deprive it of being a living space. In other words, space should engage with its users, and for this to happen, it requires more than just functionality. Kahn ensures the longevity of his structures through this approach; to him, the existence of a structure is not only physical but also spiritual (Kahn, 1965, as cited in Ertem, 2010, p. 10; Yıldız, 2020, p. 54).

On the other hand, Turrell views space as a form of expression and aims to provide viewers with new experiences. His approach transforms space into a work that is not only observed but lived and experienced, making the relationship between space and art perceptible as a whole to the viewer. In his works, the viewer becomes not only an observer but also a resident, spending time and experiencing the artwork (Zöngür & Uluçay, 2020, p. 3933). Thus, Turrell demonstrates a different living space and lifestyle beyond conventional ideas. Inspired by colors from nature, he creates his works with a minimalistic approach, using singular colors, and alters the viewer's perception through artistic/mathematical constructs (Poroy, 2014, p. 221).

Various factors contribute to the formation of the general characteristics of Kahn's architecture and Turrell's installations. Kahn, who comes from a Jewish family, was influenced by the environment in which he grew up, with traces of migration and belief evident in his works. Furthermore, his architecture draws inspiration from historical structures he encountered during his travels, incorporating classical architecture and emphasizing concepts such as geometry, material, order, and monumentality. While his early works were designed in a traditional style, over time he redefined his works in terms of light, form, and spatial usage, incorporating modern construction methods into the process (Bilir, 2019, p. 49; URL 5).

As an artist creating abstract experiences, Turrell relies on scientific calculations in his works, simultaneously creating illusion effects and questioning perception. In this process, he draws on various disciplines in his installations. Turrell's interdisciplinary background in his educational journey is effective in his approach to the viewer, space, and their relationship within this framework. Turrell introduces contemporary art with his works, presenting new perspectives by abstracting them from time and space. Consequently, his works are filled with uncertainties for the viewer. In doing so, he produces works that involve the perception of the existence of non-existent mass through the senses (Poroy, 2014, pp. 215-216). The experiential domains in his works are shaped through perception. In this context, in Turrell's installations, it can be inferred that he is influenced by the works of French philosopher Maurice Merleau-Ponty. Indeed, the concept of perception that Turrell questions in his works, along with the uncertainty of experience and time, is also a central theme in Ponty's works. According

to Ponty, humans connect with the world through their bodies and perceive it. Therefore, sensation is a state of coexistence. Turrell directs the viewer towards this experience of coexistence in his installations that are entered and experienced. In many interviews, the artist mentions creating a wordless thought experience with his works, guiding the viewer to the essence through the entered installations. Additionally, Turrell has a series of works inspired by the optical phenomenon known as the Ganzfeld effect. His studies on this phenomenon have formed the basis of his works. Turrell has also used the term Ganzfeld Effect as the name for his series of works (Ertung, 2022, pp. 1331-1333).

When examining academic studies related to Kahn and Turrell, it can be observed that their design philosophies are expressed through various concepts. In Kahn's case, these expressions primarily include light, geometry, material, symmetry, time/timelessness, monumentality/permanence, silence, integrity, part-whole relationship, fullness-emptiness, spirituality, and proportion (Akkaya, 2017, p. 218; Rabifard, 2011, pp. 86-87; Yıldız, 2020, p. 61). Kahn, in designing his structures, utilized geometry as a tool to shape central forms in space. Additionally, he used geometry, material, light, and elements of nature to provide semantic impact to the space, defining the form of the space (Ersal, 2013, p. 109). Although the geometric shaping of the interior space, spatial organization, functionality, and identity are determinative in Kahn's structures, this condition is expressed through an arrangement where monumentality and permanence are also influential (Yıldız, 2020, p. 70). According to Kahn, space becomes visible by emerging from silence through expression.

In Turrell's structures, which convey the relationship between space and art as a whole to the viewer, the prominent concepts include light, color, spirituality, material, geometry, engineering, science, mathematics, fullness-emptiness, interaction, psychology, and perception (Ertung, 2022, pp. 1331-1333; Poroy, 2014, p. 221; Zöngür & Uluçay, 2020, p. 3940). In his works, the viewer becomes not only an observer but also a resident, spending time and experiencing the artwork. The artist introduces new experiences through the intersection of art, science, and design, bringing a fresh perspective to installation art. Additionally, Turrell allows the viewer to reexperience the space through his expressive form (Zöngür & Uluçay, 2020, p. 3933).

When examining the design philosophies of Louis Kahn and James Turrell through the literature, it is evident that they converge on certain concepts while diverging on different focal points (Figure 1). From this perspective, especially the concepts of light, geometry, and material emerge as strong shared perspectives. By delving into their views on space through these three common concepts, findings have been reached.

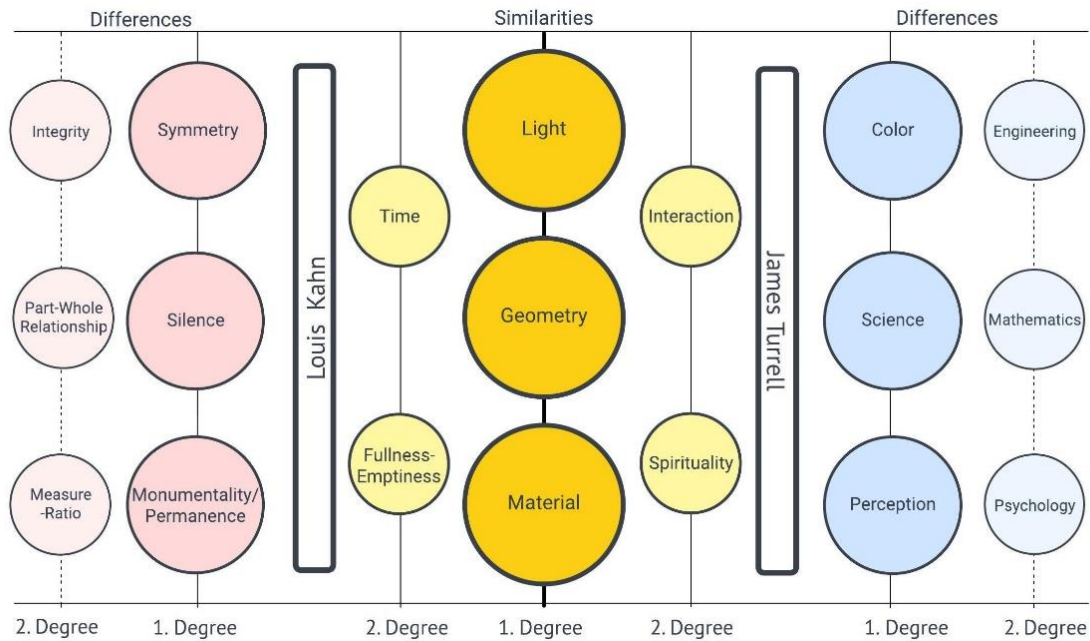


Figure 1. Conceptual Relationships in the Design Philosophies of Louis Kahn and James Turrell.

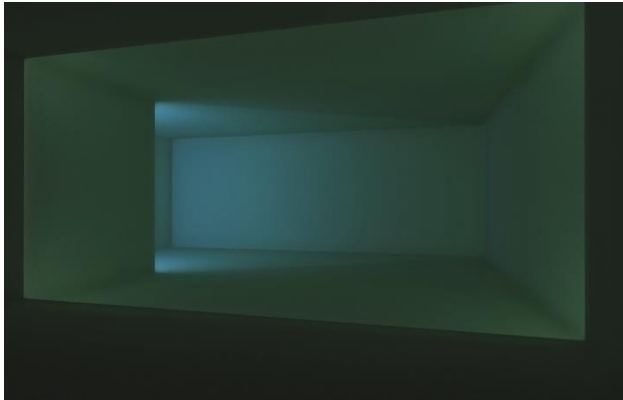
Readings of Space through the Concept of Light

The concept and utilization of light constitute common and prominent elements in the perspectives of space in Kahn's architecture and Turrell's installations. It is effectively employed in creating spatial perception and interpreting the meaning of space, often overshadowing other elements. This situation can be attributed to the fundamental necessity of light in the visual perception of space.

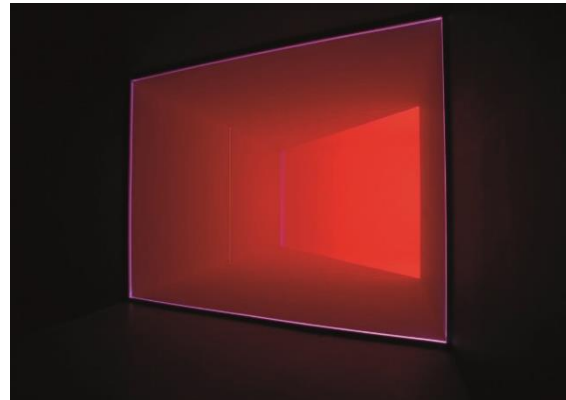
Examining the ways in which the concept of light is utilized, it can be asserted that Kahn is one of the significant architects who effectively employs light in space. He shapes space by integrating architecture and engineering with light in his works. According to Kahn, the most crucial factor in the formation of a space is natural light. He believes that the changing nature of daylight throughout the day, months, and seasons causes the building to undergo a transformation. Therefore, he avoids the use of artificial light in his works to prevent a single time period from being permanent. Kahn's approach stems from his desire to emphasize the relationship between the structure and its surroundings (Ersal, 2013, p. 105).

In Turrell's works, the manner in which light and darkness are employed constitutes one of the most important elements. Turrell views both artificial and natural light as tools for questioning space and time, creating experiences that challenge perception (Daşkesen, 2022, p. 96; Poroy, 2014, p. 216; URL 6; URL 7). His work titled "Wedgework" serves as an example of this approach (Table 2). In this piece, Turrell reshapes the space by creating a virtual wall effect using projection lights (Altunok, 2019, p. 60). The artist, who addresses the perception and aesthetics of light in the space, influences viewers' visual perceptions. In this process, he creates form through light transitions and the intensity of light (Daşkesen, 2022, p. 103).

Table 2. Wedgework, J. Turrell (URL 8, URL 9).



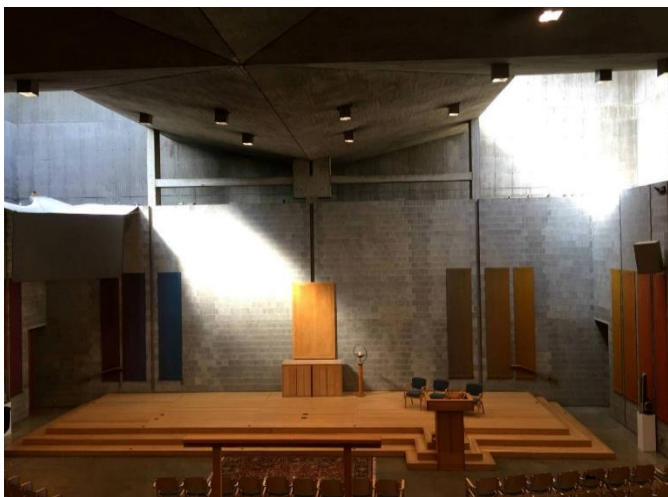
Wedgework 3 (URL 8)



Wedgework 5 (URL 9)

When examining Kahn and Turrell's methods of using light, it is observed that Kahn employs light not directly but by circulating it within the structure as beams of light or through clear geometric voids. This approach is an expression of his consideration of designs in conjunction with natural light (Yıldız, 2020, p. 13). Kahn's architecture encompasses social, emotional, and spiritual dimensions. Therefore, light, beyond being a mere illuminating element, adds meaning to space in various forms, such as beams, bright or faint, (Table 3). While light reorganizes space by dividing it, it also consolidates spaces into a single volume as an organizer. The light in the space enhances its quality and highlights material-specific differences. Kahn carefully executed material placement with attention to ensuring that each element is displayed under light without concealment (Kayaduran & Gürdağ, 2022, p. 256). Indeed, in Kahn's philosophy, the prominence of space is as crucial as that of light (Akkaya, 2017, p. 215).

Table 3. First Unitarian Church of Rochester, L. Kahn (URL 10, URL 11).



First Unitarian Church of Rochester, A View from the Apse Area (URL 10)



First Unitarian Church of Rochester, View from a Place of Worship (URL 11)

In his works, Turrell utilizes light to create transparency by taking advantage of the openings he creates, ensuring clear perception of objects (Kosky, 2013, p. 44). Consequently, he explores the space, transforming architectural elements, space, and void by associating them with light (Ertung, 2022, p. 1331). As an additional design element in his works, the artist reflects and uses color through light. Through light, the color present in the space transcends its two-dimensional nature and gains volumetric significance (Ertung, 2022, p. 1335) (Table 4, Table 8).

Table 4. Afrum (White) ve Virga, J. Turrell (URL 12, URL 13).



Afrum (White) (URL 12)



Virga (URL 13)

In defining the relationship between light and space in the works of the architect and artist, certain concepts come to the forefront. In Kahn's structures, this relationship is observed through material, space organization, time, nature, and spirituality. On the other hand, in Turrell's works, it is perceived through nature and spirituality, as well as color and form. Examples of Kahn's usage include the Kimbell Art Museum, the Salk Institute, the Exeter Library, the Yale University Art Gallery, and the First Unitarian Church. Among these structures, the Kimbell Art Museum stands out as the one where Kahn most effectively utilizes light. This building is composed of repeated vaults organized in the space, with the source of light and its effects achieved through the structure. The gaps formed between these vaults serve as light windows, allowing the perception of all possible effects of natural light throughout the day, year, and season inside. The atmospheres created within the interior at different times express the richness of light. Consequently, light forms envelopment, a sense of unity, and spirituality in the space. This richness is deciphered from various exhibition objects taking on the character of light, different colors felt in the space, and the brightness reflected on the vaults (Akkaya, 2017, p. 214) (Table 5).

Table 5. Kimbell Art Museum, L. Kahn (URL 14, URL 15).



Kimbell Art Museum, A View from the Gallery Space (URL 14)

Kimbell Art Museum, A Different Perspective from the Gallery Space (URL 15)

James Turrell's examples of light usage include the Roden Crater, Skyspace, and Ganzfeld series. Among these works, the one in which he most effectively uses light is the Roden Crater. The Roden Crater is an observatory where light, time, landscape, and spiritual experience are continuously observed with the naked eye (URL 16). According to Turrell, this work represents the pinnacle of his endeavors. In creating an environment for experiencing and contemplating light in his work, he also influences human visual and psychological perception. In Roden Crater, Turrell achieves this effect through tunnels and areas opening to the sky. He has shaped these areas to allow the observation of the sky, the sun, the moon, and the stars, thus creating spaces and constructing his work entirely from elements of nature (Poroy, 2014, p. 215). In this work, the integration of nature with light and color as an element of art has provided a new experience in terms of spatial design. Nature in the artwork not only houses the artistic creation but becomes an integral part of the piece (Zöngür & Uluçay, 2020, p. 3935) (Table 6).

Table 6. Roden Crater, J. Turrell (URL 16, URL 17, URL 18).



Roden Crater Exterior View (URL 16)



Eastern Entrance of Roden Crater (URL 17)



Roden Crater Alpha (Eastern) Tunnel (URL 18)

In the context of the selected sample, effective utilization of light is a design parameter in both the disciplines of architecture and installation art. Kahn and Turrell often incorporate natural light into their works; however, while Kahn avoids the use of artificial light, Turrell employs artificial light in his installations with great efficacy. This can be attributed to their frequent focus on indoor installations. Louis Kahn's insistence on using natural light stems from his refusal to perceive a space as devoid of light and his desire to emphasize the relationship between the structure and its surroundings. By employing natural light in a space, Kahn aims to highlight the perception of different times of the year, seasons, and various times of the day, while avoiding the imposition of a single time period dictated by artificial light. This approach seeks to narrate the flow of time and the world's changes through architecture (Ersal, 2013, p. 105). Throughout this process, it is observed that creating perception and understanding space through light are common goals for both Kahn and Turrell.

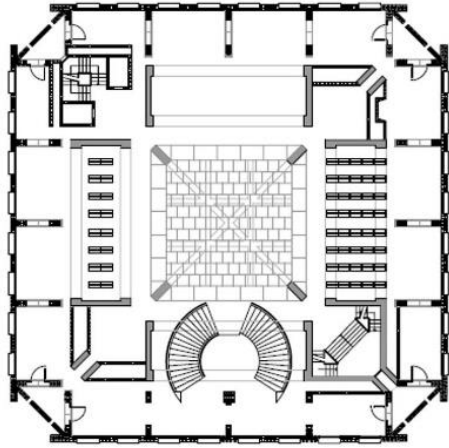
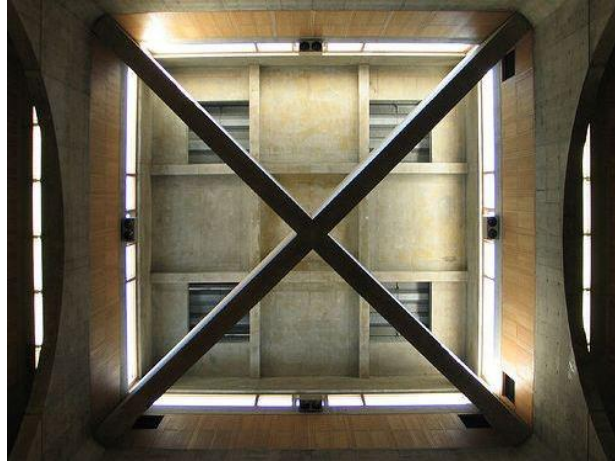
Readings of Space Through the Concept of Geometry

In both Kahn's architecture and Turrell's installations, "geometry" stands out as a common and predominant element in the way space is perceived. This element plays a significant role in the formal perception of space in both architectural discipline and installation art. In geometric organization, it is occasionally employed as a mass, sometimes as an object, and frequently as voids on surfaces. These voids serve to admit natural light and facilitate the planned distribution of volume within both Kahn's architecture and Turrell's installations.

Examining Kahn's use of geometry, it is observed that he often utilizes fundamental geometric shapes to create forms. In his structures, he expresses geometry as a tool defining the form of space and utilizes it to comprehend space, thereby ensuring a central shaping that encompasses main and ancillary figures (Ersal, 2013, p. 107) (Table 7). Examples illustrating this approach include the "National Assembly Building in Bangladesh," the "Kimbell Art Museum," and the "Exeter Library." In his structures, geometric forms such as squares and circles are juxtaposed to form a cohesive whole. The resulting simple geometric forms and abstract relationships in the floor plans are evident (Köseoğlu, 2017, p. 64). It can be argued that the inspiration behind Kahn's design approach stems from historical structures, such as the Egyptian Pyramids, constructed with pure geometry, carrying a meaning beyond the functionality of architecture (Bilir, 2019, p. 49).

Although in modern architecture, the use of pure geometry is often considered non-functional, Kahn demonstrated through his designs how geometric objects could be highly functional, imbuing them with emotional and imaginal significance. In this regard, Kahn's incorporation of basic geometric forms and his adherence to the principle of permanence can be considered among the most significant distinctions in both his structures and design philosophy (Yıldız, 2020, p. 18).

Table 7. Exeter Library, L. Kahn (URL 19, URL 20).

Ground Floor Plan of Exeter Library
(URL 19)Ceiling View from the Interior of Exeter Library
(URL 20)

In Turrell's works, the use of geometry is devoid of symbolic meanings and directly relates to visual experience and perception. Examples of this usage include the "Projection," "Shallow," and "Skyspace" series. In the artist's creations, geometry is highlighted through openings in surfaces, forms placed within space, and the use of light. At this juncture, light also creates three-dimensional colored spaces. To achieve this, Turrell complements his exploration of geometry in space with fundamental geometric forms such as circles, triangles, rectangles, and squares, using colored lights on surfaces (Daşkesen, 2022, p. 101) (Table 8).

Moreover, by employing geometry within the space, the artist aims to create perceptual effects on the viewer. Turrell, driven by his curiosity for geometry and mathematics, distinguishes his works by reflecting light into a corner of an interior space, creating three-dimensional geometric forms in his piece named "Carn Green" from the "Projection" series. Similarly, in his "Shallow" series, the use of light in monochromatic and three-dimensional geometric forms within an interior space is evident.

Table 8. Gard Blue and Projection Series: Carn Green, J. Turrell (URL 21, URL 22).



Gard Blue (URL 21)

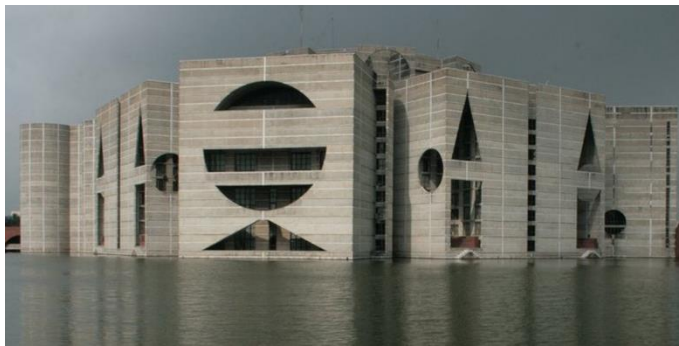


Projection Series: Carn Green (URL 22)

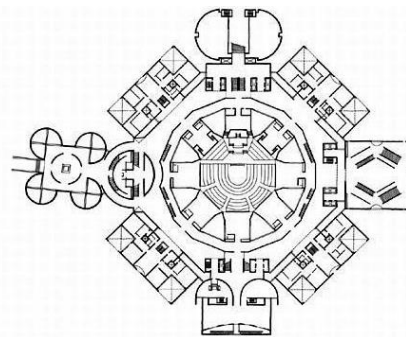
Kahn employs the concept of geometry in both the floor plans and the formation of form and structure in his buildings (Table 7, Table 9). Additionally, traces of mandala figures can be observed schematically in the portrayal of geometry in his structures. In his architecture, Kahn

formulates the order and formal concept through the geometric diagrams he creates. The National Assembly Building in Bangladesh is one of the works where this concept is prominently featured. The geometry of mandala figures determines the form of the structure. However, Kahn employs these figures not directly but by introducing irregularities, infusing dynamism into his buildings. In the design of the National Assembly Building, a symbolic monument for the Bangladeshi government, Kahn strategically incorporates natural light into the structure by introducing geometric voids on the facade, using it as an element shaping the form. By means of these geometric voids on the facade, he strengthens the impact of changing light throughout the day by allowing light to enter the space from different angles and varying intensities. Furthermore, these openings shaping the facade contribute to creating unity in architecture (Gast, 1998, as cited in Ersal, 2013, p. 109; URL 23) (Table 9).

Table 9. National Parliament House of Bangladesh, L. Kahn (URL 24, URL 25).



Facade View of the National Parliament House of Bangladesh (URL 24)



Floor Plan of the National Parliament House of Bangladesh (URL 25)

Turrell utilizes geometry as a method to create perception and emotion without symbolic meaning. This is exemplified in his series of works titled "Skyspace." Through geometrically shaped voids, he establishes a connection with the sky and allows natural light to diffuse into these voids. The forms opened in the ceiling evoke a sense of infinity and boundlessness in the space, influencing the viewer's perception accordingly. Turrell employs geometric shapes such as rectangles, circles, squares, and ovals for these voids in his works (Ertung, 2022, p. 1333; Poroy, 2014, p. 219).

Moreover, in contrast to the three-dimensional use of geometry in the "Projection" series, Turrell employs geometry in the second dimension as a geometrically shaped trace on the wall, as observed in his works (Altunok, 2019, p. 36). An example illustrating the diversity in Turrell's use of geometry can be found in his installation titled "Within Without" within the "Skyspace" series. This piece, featuring a pyramid form with a square base and colored inner walls, interacts with nature and offers the viewer a novel experience (Zöngür & Uluçay, 2020, p. 3938) (Table 10).

Table 10. Skyspace-Within Without, J. Turrell (URL 26, URL 27).



Skyspace-Within Without Interior View (URL 26)



Skyspace-Within Without Exterior View (URL 27)

When examining Kahn's approach to geometry in space, it is evident that he utilizes it in the layout and pursuit of form. Additionally, he employs basic geometric shapes such as squares, circles, and triangles to imbue emotional meaning into the space. In the structure, he aims to effectively use light by introducing geometric voids in facades, walls, and ceiling elements, thereby capturing it in different ways within the interior.

In contrast, Turrell employs geometry in space by creating voids in surfaces with geometric forms like circles and triangles. He incorporates natural light into his works in a manner similar to Kahn's structures. Furthermore, Turrell employs artificial light to create geometric forms within the space, adding a three-dimensional effect to these forms. He utilizes geometry in the space to alter the viewer's perception, particularly by opening voids in the ceiling in interior settings, thus evoking a sense of infinity.

Readings of Space Through the Concept of Material

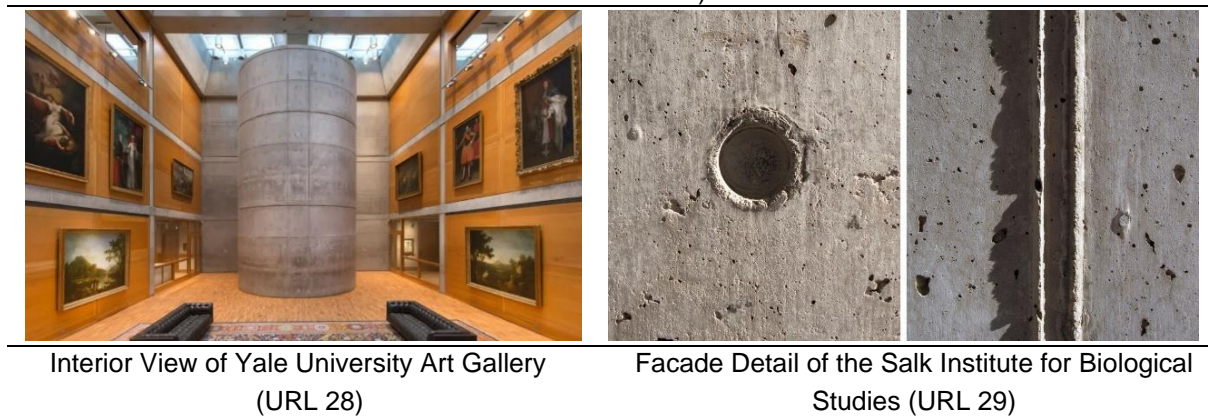
The concept of "material" stands out as a common and prominent element in the perspectives on space in Kahn's architecture and Turrell's installations. When examined in terms of usage, it is particularly noteworthy how Louis Kahn conveys the intended meaning through the elements of his structures shaped, especially through materials (Ersal, 2013, p. 109). According to him, the manner in which the designer shapes the building elements through materials is crucial in conveying the intended meaning. The utilization of materials should allow for their innate qualities to be expressed without concealment, and exploring the potential of what materials can achieve becomes significant. In this regard, Kahn aims to discover what the material itself desires to be. Accordingly, he uses materials in harmony with the nature of the structure; concrete should remain as it is after the casting process, and steel should find its place in the structure without being polished. Kahn views construction techniques as tools in this context (Akkaya, 2017, p. 218). Simultaneously, it can be argued that he achieves the desired characteristics of "self-expression of space" and "permanence" in his structures through the impact of material usage (Yıldız, 2020, p. 65).

Turrell's approach to the use of materials emphasizes the perception he intends to create. Material selection and usage are determined in line with this objective, especially in large-scale installation works, achieved through an aesthetic understanding and the assistance of science

(Poroy, 2014, p. 216). For instance, Turrell actively utilizes the textures of materials with the aid of light for spatial perception. The combination of surface textures with the characteristics and colors of materials proves effective in perceiving space (Manav, 2011, p. 95). Moreover, Turrell considers the surrounding environment and nature as materials for his work. For example, the artwork "Within Without" from the "Skyspace" series is specifically designed for the surroundings of the National Gallery of Australia's garden (Table 10). Turrell integrates this artwork seamlessly into the garden as an integral part.

Analyzing Kahn and Turrell's approach to materials, Kahn's distinctive use of exposed concrete becomes apparent. The architect utilizes concrete in its raw form, akin to a mold, in his structures. This approach, evident in the details of material use, incorporates simplicity and basic geometry into the language of his structures (Wurman, 1986, as cited in Yıldız, 2020, p. 66). Kahn refrains from altering the texture of materials, leaving any imperfections that arise during construction untouched (Table 11, Table 13). This approach allows materials to unite without losing their inherent qualities, contributing to the overall coherence of the structure (Akkaya, 2017, p. 217). The unique atmosphere created in Kahn's spaces is a characteristic feature of his structures (Kayaduran & Gürdağ, 2022, p. 256).

Table 11. Yale University Art Gallery and Salk Institute for Biological Studies, L. Kahn (URL 28, URL 29).



Turrell, on the other hand, generally prefers to use elements existing in space, such as light, color, and void, as materials. While shaping and utilizing materials in his works, he specifically defines light as an element that requires observation. Moreover, the use of building materials like concrete, stone, and plaster is emphasized because in his works, light meets the viewer not directly, but through space, surface, and material. Additionally, the element of water is sometimes a significant complementary feature in his works (Table 12). However, the use of water in his works is not merely limited to aesthetics; it also possesses functional qualities. Turrell highlights infinity in his works through the illuminated and colored water element (Ertung, 2022, p. 1333; Zöngür & Uluçay, 2020, p. 3938).

Table 12. Meeting and Stone Sky, J. Turrell (URL 30, URL 31).



Meeting (URL 30)



Stone Sky (URL 31)

Kahn's notable works that highlight his use of materials include the "Yale University Art Gallery," the "University of Pennsylvania Richards Medical Research Laboratories," and the "Salk Institute for Biological Studies." Among these examples, the Salk Institute stands out significantly in terms of material usage (Erkol, 2009, p. 57). In this structure, where Kahn employs exposed concrete, marble, and wood, he aims to elevate the user's relationship with space to a spiritual dimension. According to him, achieving permanence in a structure requires its existence not only physically but also spiritually. Kahn argues that this should be indirectly accomplished, and for this purpose, he integrates water, a complementary element, into the organization of the Salk Institute (Yıldız, 2020, pp. 54-55; Table 13).

Table 13. Salk Institute for Biological Studies, L. Kahn (URL 32, URL 33).



An Interior View of the Salk Institute (URL 32)



A View from the Courtyard of the Salk Institute (URL 33)

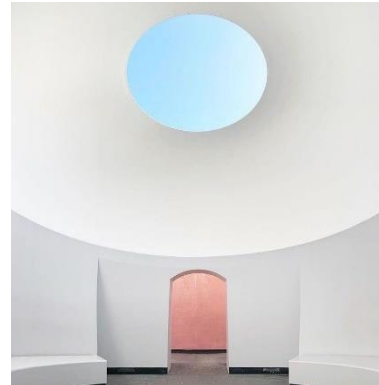
Turrell's approach to the concept of materiality is evident in his first installment of the series titled "Three Gems" within the "Skyspace" project. This structure, constructed in the form of a "stupa," one of the most significant symbols in Buddhism, invites the viewer to sit on stone benches within the space and observe atmospheric phenomena through a circular opening in the ceiling. It should be noted that stupas, in general, are minimalist architectural structures constructed in a hemispherical form and are used for meditation purposes (Snodgrass, 1985; as cited in Zöngür & Uluçay, 2020, p. 3937). The characteristics of stupas, in this context, can be seen as enhancing the meditation experience in Turrell's artwork. Similar to Roden Crater, this piece also offers the viewer an immersive interaction with nature. The display technique allows the perception of the work both from the exterior and interior, providing an experiential encounter within the indoor space. Turrell effectively employs concrete, polyester, and stone

in this artwork where he brings together art, nature, and technology. Furthermore, LED lighting arrays are utilized within the indoor space, particularly to draw attention to atmospheric phenomena (Zöngür & Uluçay, 2020, p. 3937) (Table 14).

Table 14. Three Gems, J. Turrell (URL 34, URL 35).



Three Gems Exterior View (URL 34)



Three Gems Interior View (URL 35)

When examining these examples, it becomes apparent that Kahn approached natural and artificial materials in a way that preserves their inherent qualities. He used artificial materials such as exposed concrete and steel with a focus on simplicity and the principle of permanence in interior spaces. Kahn considered materials not only for their structural properties but also to convey a specific meaning. He aimed to emphasize the unique characteristics of materials by allowing light to traverse through the space. In contrast, Turrell employs light and darkness as complementary materials in the space. He also considers the environment in which his works are placed and positions his artworks accordingly. Turrell uses natural and artificial elements, such as concrete, stone, and plaster, in his works. Furthermore, he manipulates the surfaces by employing materials in rough, smooth, glossy, and matte textures to create a specific perception in the space.

Louis Kahn and James Turrell exhibit distinct approaches to space when considering their differences. In Kahn's approach, concepts such as symmetry, silence, and monumentality/permanence take precedence, while in Turrell's approach, concepts such as color, science, and perception come to the forefront (Figure 1). Kahn aimed to instill focus, balance, and momentum for the user through symmetry in his structures, achieving this by balancing geometric voids in walls, ceilings, and the facade's organization in the spatial plan (URL 36; Yıldız, 2020, p. 70). His Beaux Arts background likely influenced the development of this approach (Köseoğlu, 2017, p. 62). Kahn associated silence with light, considering them as "siblings" and recognizing their interdependence (Rabifard, 2011, p. 90). He asserted that silence originates from materials, and light completes it (URL 37). In his texts, he referred to the geometry and material of the Egyptian pyramids as silence, correlating this concept with light (Bilir, 2019, p. 52). Moreover, he stated that the existence of space is revealed through the expression of the concept of silence (Ersal, 2013, p. 96). Kahn's adoption of monumentality and permanence greatly influences spatial design and demonstrates the impact of classical architecture and religious texts on his structures (Bilir, 2019, p. 49; Yıldız, 2020, p. 70). His

design language evolved through travels to Rome, Egypt, and Greece, where he became influenced by the play of light on monumental forms in the Mediterranean (URL 38). The perception of space as a whole and an independent entity also contributes to its association with the concept of monumentality in Kahn's designs (Köseoğlu, 2017, p. 63).

In contrast, Turrell introduces an illusionary effect prominently in his works through mathematical and artistic touches. Illusions in his works are influenced by philosophical texts and perceptual phenomena. Turrell employs complementary elements and materials such as light, color (light and surface color), to create and convey this effect to the viewer. He aims to highlight spatial qualities in this way (Ertung, 2022, p. 1326; Poroy, 2014, p. 221; Zöngür & Uluçay, 2020, p. 3935). In addition to the illusionary effect, Turrell questions perception in his works, focusing on the viewer's bodily experience and using perception as a tool (Ertung, 2022, p. 1333; Poroy, 2014, pp. 216-217).

Conclusion

The study aims to delineate the similarities and differences in the perspectives on space within the disciplines of architecture and installation art. Through an examination of the works of Louis Kahn and James Turrell, the concept of space is scrutinized. The findings reveal both similarities and differences in how these two artists approach space (Figure 1). Expressions identified through content analysis, namely light, geometry, material, interaction, time, spirituality, and the concepts of fullness-emptiness, emerge as fundamental elements in the understanding of space within both architectural discipline and installation art. Among these, light, geometry, and material are frequently employed in the interpretation of space in both fields. However, interaction and spirituality are more prominent in Turrell's approach, while time and fullness-emptiness are emphasized in Kahn's interpretation of space.

In the creation and interpretation of space, both architecture and installation art share the common element of "light," which is effectively utilized to evoke spatial perception and meaning. The visual perception of space is intrinsically linked to the essentiality of light. Light highlights the desired elements by bringing them to the forefront and guiding the perception of the intended message. Nevertheless, unlike Kahn, Turrell utilizes the effect of light as a guide for other parameters.

Another shared aspect, the concept of "geometry," proves influential in the formal perception of space in both architectural discipline and installation art. This formal perception is employed, at times, as a mass, an object, and mostly as openings on surfaces. Geometric openings on surfaces facilitate the admission of natural light in both fields. However, while Kahn imbues the concept of geometry with symbolic meanings such as permanence, Turrell employs it as a tool to create the desired impact and perception in space without abstract connotations.

Lastly, when examining the concept of "material," it is noteworthy that Kahn utilizes natural and artificial materials in harmony with the essence of his structures, emphasizing the permanence of his works. On the other hand, Turrell employs nearly any material at his disposal, choosing them based on their influence on the viewer and the parameters of light. The temporal nature of Turrell's works allows for flexibility in material selection. In this context, the concept that is

shared between both architecture and installation art also presents varying aspects based on its usage.

The fundamental distinction in the approach of Louis Kahn and James Turrell to space lies in the permanence or temporality of their respective works. While permanence is predominant in Kahn's structures, Turrell focuses on the perception his works create in the viewer.

In conclusion, both representatives exhibit unique perspectives, demonstrating different sensitivities towards the various layers of the spatial phenomenon. The study underscores the depth of the spatial phenomenon as a unifying element between the disciplines of architecture and installation art.

References

- Akkaya, N. N. (2017). Louis I. Kahn, light is the theme: Louis I. Kahn and the Kimbell Art Museum: comments on architecture. *Milel ve Nihal*, 14, 213-221.
- Atalay, M. C. & Baba, B. (2021, December). Arazi sanatçısı James Turrell'in yapıtlarında zaman kavramının ışık ile ifadesi. *BILTEK-V International Symposium on Current Developments in Science, Technology, and Social Sciences*, Malatya.
- Altunok, A. (2019). *Yapay ışığın yapısal bir öge olarak soyut heykelde kullanımı*. (Master's thesis). Retrieved from the council of higher education thesis center (570250).
- Balaban Varol, E. & Varol, A. (2022). Sanat aracılığıyla mekân deneyiminin aktarımı üzerine bir inceleme: Do Ho Suh. *Sanat ve Tasarım Dergisi*, 12(2), 499-514.
- Bilir, B. M. (2019). *Modernizmin revizyonu bağlamında geleneğin ihyası*. (Master's thesis). Retrieved from the council of higher education thesis center (592576).
- Creswell, J. W. (2021). *Nitel araştırma yöntemleri: beş yaklaşıma göre nitel araştırma ve araştırma deseni*. Ankara: Siyasal Kitabevi.
- Daşkesen, H. (2022). Işığın kaynak olarak kullanıldığı sanat yapıtlarında form arayışı. *The Journal of Academic Social Science*, 133, 88-111.
- Demir, H. (2019). *Yerleştirme sanatı ve mekân: iç mimari tasarım örnekleri üzerinden değerlendirme*. (Master's thesis). Retrieved from the council of higher education thesis center (591325).
- Erbay, M., Zorlu, T., Akgül, B., Onur, D. & Aras, A. (2013). *Sanat ve mimarlık arakesitinde tasarım stüdyoları (1st ed.)*. Ankara: Nobel Yayınları.
- Erkol, İ. (2009). *Utari İzgi ve Türkiye'de modern mimarlık*. (Master's thesis). Retrieved from the council of higher education thesis center (251747).
- Ersal, L. Ö. (2013). *Mimari mekânın biçimlendirilmesi ve anlam boyutu: ontolojik yaklaşım*. (Master's thesis). Retrieved from the council of higher education thesis center (350433).
- Ertem, Ü. (2010). *Sinema ve mimarlık etkileşiminin örnek kara filmler üzerinden incelenmesi*. (Master's thesis). Retrieved from the council of higher education thesis center (292336).
- Ertung, B. B. (2022). James Turrell'in ışıkla şekillenen enstalasyonları. *İdil Sanat ve Dil Dergisi*, 97, 1325-1337.
- Erzen, J. N. (1976). Eğitimin estetik süreç olarak yorumu ve mimarlık eğitimi. *ODTÜ Mimarlık Fakültesi Dergisi*, 2(2), 175-185.
- Hasol, D. (2017). *20.yy. Türkiye mimarlığı*. İstanbul: Yem yayınları.

- Kaya, Y., Sağsöz, A. (2022). İfade aracı olarak enstalasyon sanatı ve mimarlık: Rachel Whiteread ve Do Ho Suh' un eserleri üzerine bir inceleme. *Akademik Sanat*, (15), 1-29.
- Kayaduran, K., Gürdağ, B. (2022, September). Işığın tasarım sürecindeki görünürlüğü: Louis Kahn eskizleri üzerine bir inceleme. *Second International Symposium on Culture, Art and Society*, Van.
- Kosky, J. L. (2013). Contemplative recovery: the artwork of James Turrell. *CrossCurrents* 63(1), 44-61.
- Köse Doğan, R. (2016). Resim ve mekân arasındaki ilişki: ilham veren projeler. *Online Journal of Art and Design*, 4(2), 48-65.
- Köseoğlu, E. (2017). Louis I. Kahn yapılarının biçim dili. *Mimarlık Dergisi*, 394, 62-66.
- Manav, B. (2011). Hacimde bir tasarım parametresi olarak renk. *Sanat ve Tasarım Dergisi*, 1(8), 93-102.
- Mulla, G. (2019). *Bir tanık olarak mekan*. (Art Proficiency Thesis). Retrieved from the council of higher education thesis center (561317).
- Poroy, A. (2014). Sanat ve bilimin kesişiminde bir yerleştirme sanatçısı: James Turrell. *Sanat ve Tasarım Dergisi*, 6(6), 212-223.
- Rabifard, M. (2011). *The integration of form and structure in the work of Louis Kahn*. (Unpublished master's thesis). Eastern Mediterranean University, Northern Cyprus.
- Seyidoğlu, H. (2020). *Bilimsel araştırma ve yazma el kitabı*. İstanbul: Güzem Can Yayınları.
- Uçar, T. F. (Ed.). (2011). *Görsel kültür*. Eskişehir: Web-Ofset.
- URL 1: <https://archi101.com/mimarlar/louis-kahn/>, Access Date: 04.06.2023
- URL 2: <http://www.mimarhane.org/louis-kahn/>, Access Date: 04.06.2023
- URL 3: <https://www.arkitera.com/haber/louis-kahna-yeni-den-bakis/>, Access Date: 14.12.2023
- URL 4: <https://www.arts.gov/honors/medals/james-turrell>, Access Date: 14.12.2023
- URL 5: www.architectural-review.com/rethink/viewpoints/louis-kahn-the-space-of-ideas/8637503, Access Date: 04.06.2023
- URL 6: <http://jamesturrell.com/about/introduction/>, Access Date: 04.06.2023
- URL 7: https://web.archive.org/web/20220104163131id_/https://www.e-periodica.ch/cntmng?pid=ptt-001:1990:0::991, Access Date: 04.01.2024
- URL 8: <https://www.wikiart.org/en/james-turrell/wedgewood-3-1974>, Access Date: 04.01.2024
- URL 9: <https://www.levygorvy.com/exhibitions/depth-perception-james-turrell/>, Access Date: 04.01.2024
- URL 10: <https://exploringupstate.com/first-unitarian-church-rochester-ny/>, Access Date: 04.01.2024
- URL 11: <https://www.archdaily.com/84267/ad-classics-first-unitarian-church-of-rochester-louis-kahn>, Access Date: 04.01.2024
- URL 12: <https://www.guggenheim.org/artwork/4084>, Access Date: 04.01.2024
- URL 13: <https://www.guggenheim.org/artwork/4088>, Access Date: 04.01.2024
- URL 14: <https://kimbellaart.org/art-architecture/architecture/kahn-building>, Access Date: 26.10.2023

- URL 15: <https://www.archdaily.com/123761/ad-classics-kimbell-art-museum-louis-kahn/503808a328ba0d599b000a3f-ad-classics-kimbell-art-museum-louis-kahn-photo?nextproject=no> Access Date: 04.01.2024
- URL 16: <https://rodencrater.com/about/>, Access Date: 04.01.2024
- URL 17: <https://www.pacegallery.com/journal/support-light/>, Access Date: 14.12.2023
- URL 18: <https://rodencrater.com/spaces/alpha-east-tunnel/>, Access Date: 14.12.2023
- URL 19: https://www.archdaily.com/63683/ad-classics-exeter-library-class-of-1945-library-louis-kahn/5037e19728ba0d599b0001c2-ad-classics-exeter-library-class-of-1945-library-louis-kahn-ground-floor-plan?next_project=no, Access Date: 04.01.2024
- URL 20: https://www.archdaily.com/63683/ad-classics-exeter-library-class-of-1945-library-louis-kahn/5037e18c28ba0d599b0001be-ad-classics-exeter-library-class-of-1945-library-louis-kahn-photo?next_project=no, Access Date: 04.01.2024
- URL 21: <https://www.spencerart.ku.edu/exhibition/james-turrell-gard-blue>, Access Date: 04.01.2024
- URL 22: <https://www.artsy.net/artwork/james-turrell-projection-series-carn-green-1>, Access Date: 04.01.2024
- URL 23: <https://youtu.be/81lShPkLcz4?si=d7ccWnqULzLneScl>, Access Date: 04.01.2024
- URL 24: <https://arkeopolis.com/louis-kahna-yeni-den-bakis-sergisi/>, Access Date: 04.01.2024
- URL 25: <https://www.arkitektuel.com/banglades-ulusal-meclis-binasi/>, Access Date: 06.11.2023
- URL 26: <https://www.thecollector.com/james-turrell-skyspace-art/>, Access Date: 06.11.2023
- URL 27: <https://www.canberratimes.com.au/story/6071966/james-turrells-skyspace-at-the-national-gallery-is-canberras-number-one-pash-point/>, Access Date: 04.01.2024
- URL 28: <https://www.nytimes.com/2016/05/01/arts/design/whispers-of-louis-kahns-vision-at-the-yale-center-for-british-art.html>, Access Date: 04.01.2024
- URL 29: <https://metropolismag.com/viewpoints/kahns-concrete/>, Access Date: 04.01.2024
- URL 30: <https://www.flickr.com/photos/musaeum/8866485658>, Access Date: 04.01.2024
- URL 31: <http://nothingmajor.com/journal/tags/light/>, Access Date: 04.01.2024
- URL 32: https://www.archdaily.com/61288/ad-classics-salk-institute-louis-kahn/5037dfb328ba0d599b00012e-ad-classics-salk-institute-louis-kahn-photo?next_project=no, Access Date: 06.11.2023, 04.01.2024
- URL 33: <https://www.salk.edu/about/>, Access Date: 04.01.2024
- URL 34: <https://hainessgallery.com/james-turrell-work>, Access Date: 04.01.2024
- URL 35: <https://secretsanfrancisco.com/turrell-deyoung/>, Access Date: 10.12.2023
- URL 36: <https://www.youtube.com/watch?v=b99oGua6V20>, Access Date: 10.12.2023
- URL 37: <https://www.youtube.com/watch?v=LlxhfU1EVBA>, Access Date: 10.12.2023
- URL 38: <https://www.youtube.com/watch?v=47hXQTNeXO4&t=6s>, Access Date: 10.12.2023
- Usta, G. (2020). Mekân ve yer kavramlarının anlamsal açıdan irdelenmesi. *Turkish Online Journal of Design, Art, and Communication*, 10(1), 25-30.

- Üngür, E. (2011). *Mekân kavramının disiplinler arası tarihsel değişimi üzerinden mimarlık & mekân ilişkileri*. (Master's Thesis). Retrieved from the council of higher education thesis center (310492).
- Taşkaya, Y. (2022). *İfade aracı olarak enstalasyon sanatı ve mimarlık*. (Master's thesis). Retrieved from the council of higher education thesis center (752097).
- Taştan, R. T. (2018). *Türkiye' de çağdaş sanatta yerleştirme (enstalasyon) ve kültür*. (Art Proficiency Thesis). Retrieved from the council of higher education thesis center (519359).
- Toluyağ, D. (2020). Sanat pratiğinde enstalasyon, mekan ve nesne. *Akademik Sanat*, 5(11), 101-114.
- Yerce, N. E. (2007). *Enstalasyon ve mekanı*. (Master's thesis). Retrieved from the council of higher education thesis center (223607).
- Yıldırım, A. & Şimşek, H. (2008). *Sosyal bilimlerde nitel araştırma yöntemleri*. (7th ed.). Ankara: Seçkin Yayıncılık.
- Yıldız, A. (2020). *Louis Kahn yapılarının iç mekan biçimlenişi*. (Master's thesis). Retrieved from the council of higher education thesis center (619799).
- Zöngür, C., Uluçay, N. Ö. (2020). Sanatta mekânın yeni deneyimi: James Turrell. *Turkish Studies*, 15(8), 3931-3941.