

The experience of space: A sensorial analysis of the Chapelle Notre-Dame-du-Haut by Le Corbusier (1955) and Bruder Klaus Field Chapel by Peter Zumthor (2007)

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ABSTRACT: Although Le Corbusier and Peter Zumthor belong to different generations and their work addresses different issues, both establish connections with the world of the arts and share a concern for the space experience. Given today's dominance of psychological awareness, research on spatial experience is pertinent for contemporary architectural practice.

This paper will analyze the Chapelle Notre-Dame-du-Haut by Le Corbusier (1955) and the Bruder Klaus Field Chapel by Peter Zumthor (2007). The aim is to explore the influence of art on the designs of both architects. Le Corbusier will be examined through his connections with the sculptor Joseph Savina, while Peter Zumthor will be explored through his close relationship with the work of Joseph Beuys. The study of the theoretical work of each author and the analysis of the graphic documentation of each chapel will provide a deeper understanding of how Le Corbusier and Zumthor responded to a shared concern: the experience of space and its relationship with art.

The methodology used in this research integrates various documents, such as the theoretical works of Le Corbusier and Peter Zumthor and documentation from both chapels. The findings of this research enable an understanding of how Le Corbusier and Peter Zumthor respond to a similar concern, wherein art plays a significant role in the experience of space. This research will further contribute to the unexplored relationship between the two architects regarding their awareness of spatial experience and the emotions evoked in individuals engaged within these spaces.

KEYWORDS: Spatial experience; Le Corbusier; Peter Zumthor; Chapelle Notre-Dame-du-Haut; Bruder Klaus Field Chapel

INTRODUCTION

Recently, several architects have expressed concern about the sensorial experience of space, addressing the topic both in their architecture and research (Mallgrave, 2010). However, it is crucial to highlight that this subject has also been explored internationally by renowned architects such as Le Corbusier and Peter Zumthor. This approach is evident both in their architectural and theoretical works (Le Corbusier 1946; Zumthor 1999). When analyzing the architectural production of these architects, one sees that they share the same epistemological and metaphysical concerns (Labbé 2012; Lee 2022). However, there is limited information supporting the idea that art or artists serve as a significant reference by shaping the sensory experience of space, despite both architects acknowledging this influence. The lack of information on this topic makes this essay important, as it provides this perspective on the influence of art in the work of Le Corbusier and Peter Zumthor. This analysis will contribute to a deeper understanding of how such an influence affects the sensory experience of space.

Le Corbusier, in addition to being an architect, was also a painter, sculptor, urban planner, and theoretician. His architecture expresses an approach to the arts, visible throughout his life. Early in his career, with the purist movement and the founding of *L'Esprit Nouveau* between 1918 and 1920, the architect expressed his interest in the connection between architecture and painting (Le Corbusier 1920; Ozenfant e Jeanneret (Le Corbusier) 2005). Later, with *L'espace indicible*, he advocated for the rapprochement between painting, sculpture, and architecture. Le Corbusier's engagement in various artistic fields makes his work a particularly relevant case study. Several artists have influenced his practice, and one of the most common comparisons is between Le Corbusier and Picasso or Le Corbusier and Fernand Léger (Sales 2012). However, in none of the cases is the direct influence on the sensorial experience of space in Le Corbusier's work is made explicit. In the case of the Notre-Dame-du-Haut, one of the architect's most iconic works, the influence of Josep Savina is evident, particularly concerning the evolution of *L'espace indicible* (Moneo 2022). Without Savina, Le Corbusier would not have been able to design the chapel as we know it today. Savina, thus, becomes a pivotal reference for the chapel, given his direct influence on Le Corbusier's work, by collaborating with him during the period in which he developed *L'espace indicible* (Calatrava et al. 2023). First, through the transposition of Le Corbusier's paintings into sculpture, and later, through his influence on Le Corbusier's working process. The analysis of Savina becomes essential in this essay since the sculptor was present during the period of transformation of the architect's work, which is precisely focused on the sensorial experience of space (Moneo 2022).

Peter Zumthor, although not a painter or sculptor like Le Corbusier, approaches his work with a strong connection to the arts. He states that his approach to architecture involves learning it outside of traditional architectural boundaries (Architecture Speaks 2018). Similar to Le Corbusier, who began his education in arts school rooted in the “learning by doing” method, Zumthor started working as a carpenter at a young age under the guidance of his father. This early experience fostered his approach to manual labor and cultivated his sensitivity to materials and composition (Ventura 2014; Zumthor 1999). Zumthor's work is often linked to the philosophies of Heidegger or Pallasmaa, who explore the experience of space through emotions and sensations (Labbé 2019). Two key references for this perspective are his books *Thinking Architecture* and *Atmospheres*, as both address these themes. However, when considering the influence of art or artists on his work, only a few figures stand out, such as Richard Serra or Michael Heizer (Kimmelman 2011). In the case of the Bruder Klaus Field Chapel, Joseph Beuys stands out as particularly notable for his sensitivity in the treatment of materials - an aspect that also characterizes Zumthor's architecture (Zumthor 2006). In Zumthor's case, Beuys's influence differs from that of Le Corbusier and Savina. Beuys indirectly influenced his work as an independent artist. Zumthor admires his work, understands it, and therefore, interprets it within his architectural practice.

Le Corbusier and Zumthor are two important references in contemporary international architecture, and understanding their influences enhances our comprehension of each architect's work. In the context of this essay, the analysis of the impact of artists on the work of Le Corbusier and Zumthor offers a reflection on the transdisciplinary nature of architecture as a field of knowledge. Understanding the references of each architect's approach is crucial. Furthermore, identifying the contribution of each artist helps clarify their influence on the sensory experience of the space.

1.0 RESEARCH METHODOLOGY

The research explores the sensory experience of architecture by emphasizing the influence of art. Le Corbusier with the Chapelle Notre-Dame-du-Haut (1955) and Peter Zumthor with Bruder Klaus Field Chapel (2007) are the two case studies for their importance on the theme. Both distinguish themselves through their unique approaches to spatial experience and awareness.

This research primarily employs a qualitative methodology to facilitate the cross-referencing of information from various authors. Given the extensive body of work on both architects, five key points were selected to organize the data collection: i) texts by Le Corbusier and Zumthor discussing spatial experience and emotions; ii) texts by both architects exploring the relationship between architecture and the arts; iii) texts by both architects specifically describing the Chapelle Notre-Dame-du-Haut and Bruder Klaus Chapel; iv) texts from various authors analyzing the case studies;

To analyze the data collection, tables and panels were created to facilitate the exchange of information between the two architects and resources. Although the research is mostly based on textual information, a panel was created to allow the analysis of visual elements adopted by both architects. Whether elements from tradition or elements from their architectural language. Data collection used in this research can be found in: i) archives and online resources; ii) books from Le Corbusier and Zumthor; iii) books from different authors; iv) interviews in online resources; and v) visits to the case study sites.

All the research was conducted ethically with full respect for the authorship of all architects and authors. Textual and visual information was appropriately cited, and interviews, archives, or online resources were clearly attributed to their respective authors.

2.0 CASE STUDY ANALYSIS – Le Corbusier

2.1 Le Corbusier: The Chapelle Notre-Dame-du-Haut, 1955

Le Corbusier is regarded as one of the most significant architects of the Modern Movement (Benevolo 1960). His work is defined by a constant pursuit for harmony through the sensorial exploration of space, where art plays a central role (Le Corbusier 1925).

Associated with this search for harmony, Le Corbusier published *L'espace indicible* in 1946, a space that addresses epistemological and metaphysical questions while advocating for the union of the arts between architecture, painting, and sculpture. This union aimed to transcend the purely visual idea of space towards an ineffable space, the result of plastic emotion (Le Corbusier 1946; Moneo 2022). Among the various works of the architect, the Chapelle Notre-Dame-du-Haut, from 1955, stands out because of its ability to deepen our understanding of his sensorial experience of space. According to Le Corbusier himself, the chapel at Ronchamp demonstrates that “architecture is not a matter of columns but a matter of plastic happenings”(Petit, 2019).

The chapel was commissioned to Le Corbusier in 1950 after the existing chapel was bombed by the German army in 1944. Le Corbusier had previously refused to work with the Catholic Church, but, given the formal freedom of the commission and landscape, he accepted the project. (Petit 1997) At the top of a hill in Ronchamp, the Chapel is surrounded by nature (with some later construction from 1970 and 2011 by Jean Prouvé and Renzo Piano). In terms of typology, the Chapel respects the plan of a single nave, with the apse facing east. Outside, each facade is unique, with elements that characterize it. On the south facade, the main entrance, with a 3-meter-thick wall and openings with colored glass. The east facade, an exterior altar receives around 200 pilgrims, while echoing the

interior altar on its reverse side. On the north facade is the secondary entrance with two adjoining chapels. The west facade, the only blind facade, has a gargoyle that drains water from the roof and a cistern. Finally, the roof is one of the most emblematic elements (Boesiger 1958b). It is important to emphasize that, when designing the Chapel, Le Corbusier used several references that were adopted over time, such as *objets à réaction poétique*, the use of elements from tradition, and elements from memory (Le Corbusier & Pauly 1983).

About his references, Le Corbusier maintained contact with several artists who influenced his work, such as Picasso, Rouault, Matisse, and Fernand Léger. In the case of the Chapel, the cabinetmaker and sculptor Joseph Savina stands out for his collaboration during the development of *L'espace indicible*. Savina respected the vernacular manual tradition, and his impact on Le Corbusier's work is visible in the reconciliation of the artist-artisan (Calatrava et al. 2023). The collaboration between the two artists began when Savina suggested working on the three-dimensionality of Le Corbusier's paintings. (Moneo 2022) This led to a collaboration between the two artists with polychrome sculptures such as *Ozon*, *Totem*, *Ubu*, *Idône*, *La mer*, and *Femme*. (Calatrava et al. 2023; Moneo, 2022) Among these works, Frampton highlights *Ozon* and *Ubu* for enabling the development of what would be his 'visual acoustics' of landscape. (Frampton 2001) Visible in the design of the roof, gargoyle, chapels, and altar. (Frampton 2003) Le Corbusier, when referring to the 'Phenomenon of visual acoustics', the architect affirms:

On the hill, I had meticulously drawn the four horizons. There are only four: to the east, the Ballons d'Alsace; to the south, the last spurs leave a vale; to the west the plain of the Saône; to the north a small valley and a village. These drawings are missing or lost, it is they that unlocked, architecturally, the echo, the visual echo in the realm of shape. On the 4th June 1950... Give me charcoal and some paper... (Le Corbusier 1957)

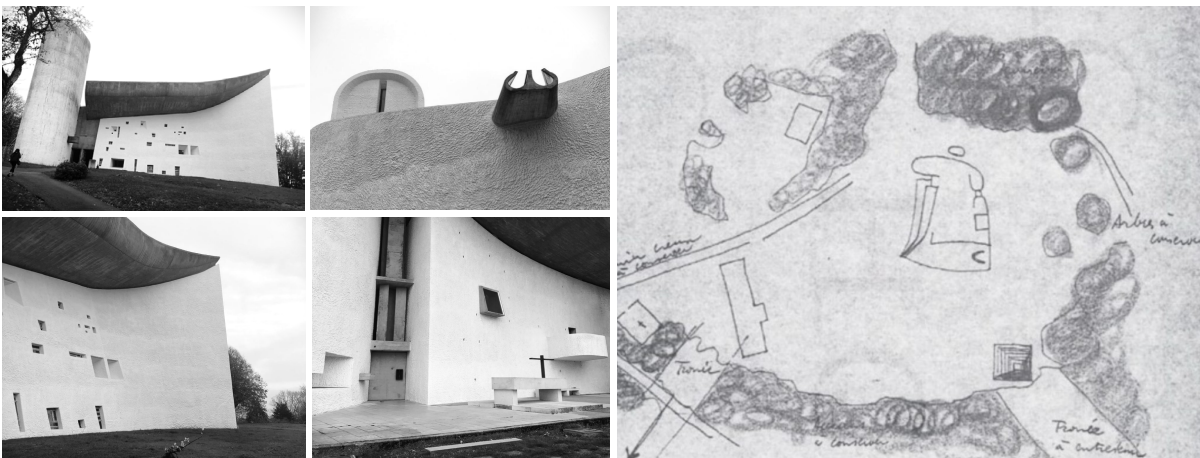


Figure 1: Le Corbusier, Chapelle Notre-Dame-du-Haut, 1950-1955 (Photos from the Author); Drawing by Le Corbusier, FLC 07514C 1959, © F.L.C. / 2025, ProLitteris, Zurich. Source: (Author 2022)

2.2 Findings: Spatial experience, Le Corbusier, and Joseph Savina

The period during which Le Corbusier collaborated with Savina corresponds to a transformative phase of his work, particularly concerning the union of the arts and the definition of *L'espace indicible*. This period enabled him to deepen his exploration of his great *interest in psycho-physiological reactions in man* (Boesiger 1958a, p. 227). But how did *Ozon* and *Ubu* influence the chapel's design? Let us return to Frampton's affirmation and the design of the roof, gargoyle, chapels, and altar.

Moneo, while describing the working process between Le Corbusier and Savina, states that the monstrous forms of *Ozon* appear to come from nature and are subject to a process of biomorphism. (Moneo 2022) It is, therefore, possible that in the design of the chapel, Le Corbusier subjected the roof to a process of biomorphism and abstraction, which distanced it from the original shape of the crab shell, captured in 1946 during a trip to New York (Le Corbusier 1957). Another possibility is the fact that this reference influences not only the form but also its concept. According to Pauly:

This crab's shell not only inspired him conceptually in the shape of the roof – an organic form to match the organic plan – it also generated the idea for the roof structure itself." (Pauly 1997, p. 90)

In the case of the gargoyle, Quetglas states that its shape is inspired by the series "Les Taureaux", which was also explored in Le Corbusier's painting (Quetglas 2022). This demonstrates a plastic exploration from painting to architecture. The chapels, which illuminate the interior space thanks to overhead light, refer to the projects of Villa Adriana, although with slight modifications in their configuration (Petit 2019). Moneo goes further by emphasizing that the chapels are the elements that bring Le Corbusier closest to his working method with Savina due to their iconographic autonomy. He also highlights other equally important "elements", such as the gargoyle (Moneo 2022). The altar, unlike traditional altars, exists in dialogue with the interior altar, separated by a concave and convex wall, which allows the repercussion of sound (Moneo 2022).

When analyzing the elements that Frampton describes – as a result of the influence of *Ozon e Ubu* - it is possible to identify an influence on the creative process. In the same way that Savina reconstructed Le Corbusier's paintings into sculpture, the architect uses other artistic references, travel souvenirs, drawings, or objects, which are then adapted to his architecture. While Savina transposes painting to sculpture, Le Corbusier's approach is much more complex, calling on different references that would not initially be interconnected in another context. The chapel is one of Le Corbusier's most important works in terms of the sensory experience of space. (Moneo 2022) Savina's influence on this theme does not have a linear and literal form. The architect does not adopt a form of *Ozon e Ubu* and integrates them into the design of the Chapel. But first, he understands the possibilities of the working process that he develops with Savina during the period in which he develops these works and adopts it on an architectural scale. In this approach, Le Corbusier included other references besides painting and sculpture, which ultimately determined the design of the chapel and, therefore, influenced the sensory experience of space.

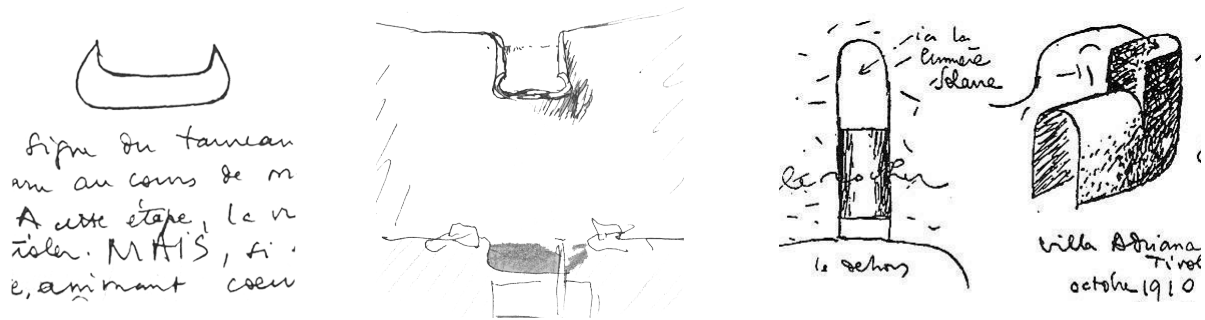


Figure 2: Le Corbusier, drawing "Entre-deux ou propos toujours reliés" 1964; Le Corbusier, FLC_CA_E18, 1951; Le Corbusier, Villa Adriana FLC P5(2)10 1910; © F.L.C. / 2025, ProLitteris, Zurich. Source: (Author 2025)

3.0 CASE STUDY ANALYSIS – Peter Zumthor

3.1 Peter Zumthor: Bruder Klaus Field Chapel, 2007

Like Le Corbusier, Peter Zumthor is a significant architect who focuses on the emotional awareness that arises from architectural experience. This concern is evident in both his writings and architectural work, mainly through his use of materials, references, and ideas. Unlike Le Corbusier, Zumthor does not engage in painting or sculpting; however, his early experience as a carpenter gave him a heightened sensitivity to composition and harmony. While many architects discuss the experience of architecture through atmospheres, Zumthor distinguishes himself by exploring this concept in a poetic dimension. For Zumthor, learning architecture doesn't come exclusively from architectural experiences but also from other fields (Mallgrave 2010, p. 189). The architect asserts that for him, learning architecture was a process of learning outside of architecture. This means to learn from other fields such as music, painting, or even arts (Architecture Speaks 2018).

The chapel was commissioned to Zumthor and constructed between 2005 and 2007 in Mechernich, Germany. Situated in a rural area, the chapel stands out for its unique presence amidst the surrounding vegetation. Its typology evokes the central plans of some Romanesque chapels, featuring overhead light and thick walls. While it does not entirely blend with the environment, it adopts the tones of the pasture and the land. The Chapel creates a profound sense of interiority, separating interior and exterior worlds, whether through light, sound, or temperature. It lacks direct windows, yet the light has a *chiaroscuro* treatment that allows the light to penetrate indirectly. Regarding materiality, the chapel is entirely constructed in concrete, with a finish that emphasizes its rough texture (Vandenbulcke 2014). In the chapel, Zumthor reduces the elements to the essentials: a cross, a small bench, an oratory area, and a bust (Byrne 2018).

In his book *Atmospheres*, the architect describes twelve factors that influence and characterized his architecture, including: i) the body of architecture; ii) material compatibility; iii) the sound of Space; iv) the Temperature of Space; v) Surrounding Objects; vi) Between Composure and Seduction; vii) Tension between Interior and Exterior; viii) Levels of Intimacy; ix) the Light on Things; x) Architecture as Surroundings; xi) Coherence; xii) The Beautiful Form; (Zumthor 2006) These aspects are evident in the chapel, alongside elements drawn from memory and tradition (do Valle Zonno 2020). Literature refers to these points as references to understand Zumthor's work. However, it became unclear how art influenced his work, even though he manifested his interest in many American artists from the '60s, '70s, and '80s (Kimmelman 2011). One of the artists who seems to have an enormous influence on his architecture is Joseph Beuys, particularly for his treatment of materials and the processes involved in this treatment:

Something is revealing about the work of Joseph Beuys and some of the artists of the Arte Povera group. What impresses me is the precise and sensuous way they use materials. It seems anchored in an ancient, elemental knowledge about man's use of materials, and at the same time exposes the very essence of their materials which is beyond all culturally conveyed meaning. I try to use materials like this in my work. I believe that they can assume a poetic quality in the context of an architectural object, although only if the architect can generate a meaningful situation for them since the materials themselves are not poetic. (Zumthor 1999, p. 10)



Figure 3: Peter Zumthor, Bruder Klaus Field Chapel, 2005-2007. Source: (Author 2025)

3.2 Findings: Spatial experience, Peter Zumthor, and Joseph Beuys

Joseph Beuys stands out among the artists of his time for his partisan activism and his exploration of materials in his art. (Russell 1986). The artist uses unconventional materials and explores the use of fat, blood, and trees, among other materials (Rosenthal et al. 2004). Beuys aims to provoke society and reflect its social concerns and political beliefs through these materials (Borer et al. 1997). But how is Joseph Beuys present in this chapel, and how does he inspire Zumthor in the experience of space?

In the case of Zumthor's work, Beuys's influence is not seen through the direct adoption of the same materials but rather through the understanding of their potential, expressiveness, and the processual activities associated with them within the broader context of the work. The use of simple materials would allow Zumthor to explore their plasticity in an ancestral way, preserving what would be considered fundamental human experiences (Ventura 2014).

I saw how Beuys worked, which was a revelation - that Beuys was working with materials, in a way like words and sound, composing in a way with materials, as a message. It was not performed. It was this material, this, and then performed. This struck me as something new, the way you learn something but then think, it is something I always knew, being very subjective is being very objective (Zumthor 2009, p. 51)

In the case of Peter Zumthor's Bruder Klaus Field Chapel, the influence of Beuys is evident in a similar way. The architect uses pure and simple materials, such as concrete, in which his formwork is made with wooden trunks (ZhiXing & Wei 2023). The plasticity acquired through this formwork is the most present aspect of the spatial experience, offering a dialogue between the visitor and the architecture itself. This formwork process is, to a certain extent, reminiscent of ancestral constructions (Jenner 2011). Without other materials, Zumthor conveys the religious message of space through matter, control of form, and light (ZhiXing & Wei 2023). The connection between Zumthor and Beuys may transcend the use of materials. Beuys was not only a sculptor but an active agent with a transversal message in his work, political and social. His art expresses a belief in time changing. Zumthor expresses a belief in sensorial exploration, which is closer to vernacular architecture than to tech architecture.

Looking to the past and preserving space quality (Zumthor & Lending 2018). In the same way that *Beuys'* "extended definition of art" in which the ideas of social sculpture could potentially reshape society and politics, Zumthor's message focuses on metaphysical experiences of how to build and inhabit space as a sensory experience through sensations (Tate Gallery 2024; Zumthor 1999).

If a work of architecture consists of forms and contents that combine to create a strong fundamental mood that is powerful enough to affect us, it may possess the qualities of a work of art. This art has, however, nothing to do with interesting configurations or originality. It is concerned with insights and understanding, and above all truth. Perhaps poetry is unexpected truth. It lives in stillness. Architecture's artistic task is to give this still expectancy a form. The building itself is never poetic (Zumthor 1999, pp. 19–20).



Figure 4: Joseph Beuys, Feuerstätte II, 1978-1979. Source: (Author 2025)

CONCLUSION

This essay aims to analyze how art can influence the sensory experience of space. In the case of the Chapelle Notre-Dame-du-Haut, the influence of the sculptor Joseph Savina is evident, with whom Le Corbusier collaborated during the development of *L'espace indicible*. In the case of the Bruder Klaus Field Chapel, the influence of Joseph

Beuys is also evident, although they did not work or collaborate. Through the analysis of these two chapels, it becomes clear that both architects were concerned with the sensory experience of space.

During the time Le Corbusier worked with Savina, he did not design any buildings. The chapel allowed him to explore his ongoing research focused on the union of the arts, which he was developing at that time (Moneo 2022). Unlike his previous works, where there was a rapprochement between painting and architecture (as is the case of purism, in which he was one of the founders, and the rationalist villas of the 1920s), with the chapel, the architect brings together other artistic approaches and references (Pauly 1997).

Savina played a crucial role in the design of the Chapel, influencing Le Corbusier's working method (Moneo 2022). Together, they transposed the architect's paintings from this period into polychrome sculptures (Calatrava et al. 2023). This exercise allowed Le Corbusier to understand that the shapes from his paintings could transcend the two-dimensionality of the canvas and take on new dimensions. The architect applied this knowledge to the chapel, reproducing different references, such as objects and drawings, which were then transformed and adopted into the work (Moneo 2022). Two emblematic examples of this appropriation are the case of the chapels, through which the architect takes up drawings from past journeys, such as Villa Adriana, as well as the gargoyle that refers to the series of "Les Taureaux" (Moneo 2022; Quetglas 2022). The Chapelle Notre-Dame-du-Haut is considered one of the most emblematic works of the late Modern Movement, both controversial and admired by critics (Jencks 2000). Savina's influence on the Chapel was so important that Le Corbusier highlights it in his book *Oeuvre Complète 1946-1952* (Boesiger 1958a). It seems thus reasonable to conclude that if Le Corbusier had not worked with Savina, he would probably not have developed this working method, which would have resulted in a particularly different conception of the chapel.

In Zumthor's case, admiration for the artist Joseph Beuys is expressed repeatedly, both in interviews and in his writings (Zumthor 1999). Beuys is distinguished by his treatment of materiality as a message. Unlike Savina, who interprets from painting to sculpture and works directly with Le Corbusier, the artist does not work with Zumthor. However, his influence is felt through the interpretation of Zumthor's work. While Beuys expresses his social and political beliefs through art, with materiality playing a central role, Zumthor focuses on understanding the sensory qualities of space through the building processes and the subsequent material expression (Zumthor 2006). Beuys's influence on the Bruder Klaus Field Chapel is evident not only in the treatment of raw materials, such as concrete, but also in the use of materials that carry a deeper meaning. In response to the chapel's religious program, Zumthor uses materials that allow him the plasticity necessary to evoke the desired spiritual atmosphere (ZhiXing & Wei 2023).

In both cases, in the Chapelle Notre-Dame-du-Haut and the Bruder Klaus Field Chapel, it is possible to identify the influence of Savina and Beuys on the sensory experience of space. On Le Corbusier, a direct influence due to Savina's participation in polychrome sculptures and *L'espace indicible*. With Zumthor, an indirect influence due to admiration for the work of Beuys. Through these two case studies, one may conclude that the integration of artists' knowledge and working methods into architectural design significantly influences the sensory experience of space. Future research could expand on this by exploring the work of other artists and examining the extent to which Le Corbusier and Zumthor incorporated their influences, thereby further influencing the sensory experience of their architecture. This essay also emphasizes the transdisciplinary nature of architecture. A field of knowledge that operates in parallel with other fields, highlighting the possibility for other artists to be able to act directly and indirectly on the design of the architect.

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