TITLE: **Sensory Phenomenology in Interior Design**

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Abstract

The aim of this dissertation is to develop an understanding of the theories and principles in phenomenology and the senses to account for the possible influential role that design factors play in creating an interior atmosphere and user experience. The practice of interior design is limited with its exploration of phenomenology (the philosophical theory of direct experience) and how it interlinks with the sensory sciences. It also has a finite comprehension of the way design elements, such as light, colour, proportion, materiality, and acoustics, are utilised when creating spatial ambiences and the influences it has on user experiences. Thus, these are shortcomings that this dissertation addresses.

By providing two case studies for the ways design factors are incorporated in the spatial structures, a portrayal of the way designers deliberately utilises these elements to create phenomenal atmospheres are proven. Both case studies are compared with their findings to form a thorough explorative understanding of how design factors have affected the physical sensitivities, perception, experience, and comprehension of the inhabitants. The significance of this study is that it informs and encourages designers to utilise these methods in their practices, for more influential, inclusive, and multi-sensorial spaces to be manifested in the practice of interior design.

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Introduction

Phenomenology and its relation to the human sensorial dimension is an aspect of interior design that is heavily overlooked. The ability to understand the ideas around phenomenology and the principles of the senses, will enable designers to produce work that is influential, meaningful, inclusive, and multi-sensorial. What happens when a direct impact is made on our senses from our environments that result in a change of our overall experiences and comprehension? What would our built environment look like, if we embrace the understandings of sensorial responses, theories of phenomenology, and creative manipulation of design factors into practice? How are the mainstream design factors incorporated in design, such as light, colour, proportion, materiality, and acoustics, and how do these affect our senses? Answering these questions will allow sensory phenomenology to be the bridge between the inhabitant and the built environment.

When it comes to phenomenology, it is characterised by the mutual premise between interior design's sensitivity to the focal inspiration of design and the inherent human sensory knowledge of material culture and atmosphere. Brooker and Weinthal (2017, p. 412) show that interior design inherently addresses the senses via the haptic and atmospheric conditions of lighting, sound, smell, and the touch of materials. Therefore, through the utilisation of conventional design factors, a designer automatically alters and manipulates the ambience of space. This then influences the perception, comprehension, experience, and the senses of the users involved.

Meanwhile, the senses are the fundamental biological tool that shapes human comprehension and understanding. Pallasmaa (2019, p. 13) states that our entire being within the world is a sensuous and embodied mode of being, and this very sense of being is the ground of existential knowledge. Thereby, the acquisition of such knowledge through our senses drives the possibilities of our built environment to unmatched levels. Sensing and creating, seeking and finding, exploring and learning; our bodies are constantly absorbing the changes of stimuli in our surroundings. It should be a designer's habit to embody a sense awareness in environments when creating spaces to help others engage with their own. This requirement will create a rich experience for both the designer and the consumer of the space.

The dissertation will take a thematic approach by underlying key principles in phenomenology, design factors, and the effects on the human senses. If findings are implemented in the field of interior design, an in-depth knowledge of how our senses influence our understanding, experiences, and creativity will be developed. The objective is to specifically examine how the conventional design factors: light, proportions, materiality, acoustics, and colour, play an important role in determining the ambience of a space. Even though many other design elements can contribute to the creation of an interior atmosphere, the ones that have just been listed will be looked at in depth.

Since the subject of phenomenology is vast it will focus on the crucial theories and philosophers that contribute to the aim of this dissertation. Moreover, the sensory sciences are also quite broad, so the attention will directly be on topics and ideologies that are

discussed and questioned within the practice of interior design. Findings from neuroscience, behavioural psychology, and philosophy will be mentioned for a further and extensive understanding of the significance as to why designers must understand themselves and others, to create environments that give an experience to the user. Lastly, primary research will consist of case studies to observe design principles and theories appropriately.

Chapter One – Phenomenology and the Senses

Phenomenology: Perception, Hapticity, and Imagination

Phenomenology is the philosophy of direct experience. It places entire value and meaning in the lived experience of human beings. All scientific theories, aesthetical judgements, or philosophical ideas are abstractions from the flow and the way of the world. A philosopher's task is to elaborate the depth of experience, specifically the imagination, consciousness, and the intermediating human relations with society and the environment. Consequently, a designer should have the same approach and mindset as that of a philosopher; to tackle the noteworthiness of experience in the world of interior design.

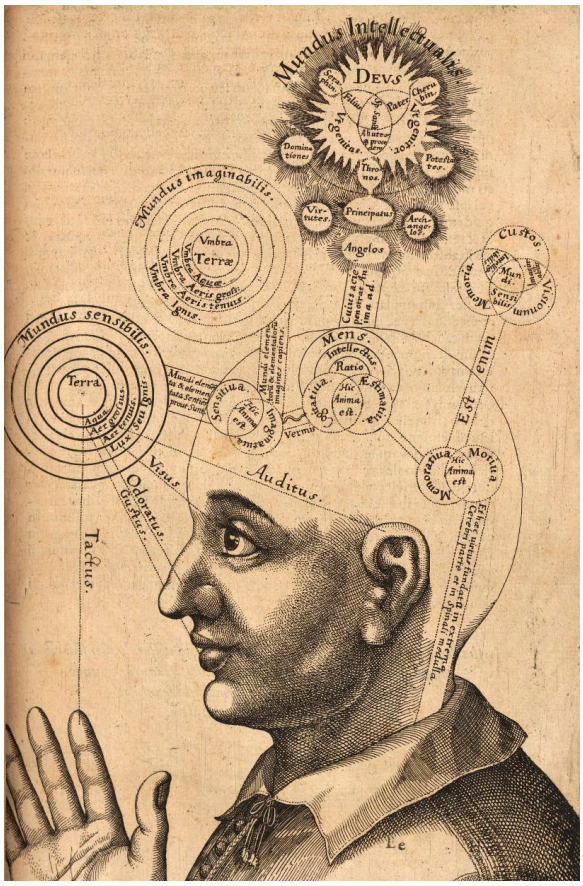

FIGURE 1: Phenomenology portrayed in a Latin annotated diagram. (Scalambrino)

Maurice Merleau-Ponty was a pioneer for his contributions to the development in the subject of phenomenology. He insisted on the primacy of the perceptual experience and the ambivalence of the physical world. Lupton and Lipps (2018, p. 18) express that the eye strokes the contours of distant glistening bodies the hand cannot reach. The portrayal that perception can go beyond what the haptic sense is limited with, means that our eyes can absorb the information from the surroundings that the hand cannot accumulate or process: such as the reflections of light from the waters, the colours of the sky, the chromatic shade of an object, and the visual appreciation of building proportions compared to other matters and living beings.

Contemplating perception through the lens of accessing unimaginable realms that are beyond what is presented to the naked eye itself is also pivotal. The ability to form a conscious mental projection of different perspectives regarding an object or building, will give insight to the holistic nature of the perceived object. Merleau-Ponty (2002, p. 142) depicts this contemplation through the following text:

> I see the next-door house from a certain angle, but it would be seen differently from the right bank of the Seine, or from the inside, or again from an aeroplane: the house *itself* is none of these appearances: it is, as Leibnitz said, the geometrized projection of these perspectives and of all possible perspectives, that is, the perspectiveless position from which all can be derived, the house seen from nowhere. But what do these words mean? Is not to see always to see from somewhere? To say that the house itself is seen from nowhere is surely to say it is invisible!

The reference to specific locations like the Seine, the aeroplane, and the interior show Merleau-Ponty exercising his imagination to comprehend all possible perspectives and the imagery of the house. Therefore, observing and then thinking from a three-dimensional viewpoint of the subject gives a holistic overview, which is a skill designers should possess to understand the full qualities and attributes of the environment. As Pallasmaa (2009, p. 85) confirms that in this way we see the depth, the softness, the hardness, the smoothness of objects.

Compared to Merleau-Ponty's findings on the significance of perception, Brooker and Weinthal (2017, p. 534) portray that the works of Peter Zumthor and Juhanni Pallasmaa, purport the primacy of perception that comes from an experience of making as being deeper than the theoretical narratives of phenomenology. So, the making-hand and hapticity is explored to be an extension of the idea of perception. Pallasmaa (2009, p. 102) emphasises that touch is the unconsciousness of vision, and this hidden tactile experience determines the sensuous qualities of the perceived object. Thus, the act of physically feeling materials through the sensory receptors in our hands forms a complete knowledge of an object, and thereby, its attributes. Where one has already touched it and formed judgements on its temperature, surface texture and weight (Pallasmaa, 2009, p. 101).

When it comes to the current trends and aesthetics in interior design, the modernism movement also affects the way users experience and form perceptions of space. Pallasmaa (1996, p. 10) connotes that modernist design has housed the intellect and the eye, but it has left the body and the other senses, as well as memories and dreams, homeless. Thus,

suggesting that designers frequently experience a discord between their creative vision and their body. This division would not only be felt in the designer, but will reflect in the work that they produce, and this will also be experienced by the users of the space that a designer creates. All due to the fact that modernism has served as an optical painkiller, an anaesthetic that dulls the body by massaging the eye (Lupton and Lipps, 2018, p. 17).

Yet, Merleau-Ponty's notion of 'perception' as the embodied, established, indifferent knowledge of the world refutes the theory that the mind is separate from the body or viewing the body as a mere mechanical object. Thus, consciousness is innate and incarnate. Otherwise, it would suggest a lack in the way one engages with world. This idea of the interlocking phenomena of our minds and our bodies, serves as the basis of how one may equally be moved by something evoked by our memory or imagination as by an actual experience (Pallasmaa, 2009, p. 132). Past cultural and personal memories of an experience also contribute to shaping one's perception. Designers can use these previous experiences and memories to create atmospheric conditions of a space. Since, buildings are evidently an extension of our memories, minds, and identities.

Senses in the Environment

The main senses of a living and breathing being are as follows: hearing from the ears, seeing through the eyes, tasting from the tongue, touching through the skin, and smelling through the nose. It is the sensitivities our bodies hold that keep the secret to understanding and forming relationships with the physical world (as shown in Figure 2). As Lupton and Lipps

(2018, p. 10) disclose that human creatures engage in numerous acts of lifting, licking, touching, sniffling, throwing, dropping, hearing, balancing, and more, constantly testing the edges of physics to understand (or "make sense of") the world we were born to discover. So, when it comes to a designer it should be a priority to discover themselves, explore their own senses, and form an identity to create meaningful spaces.

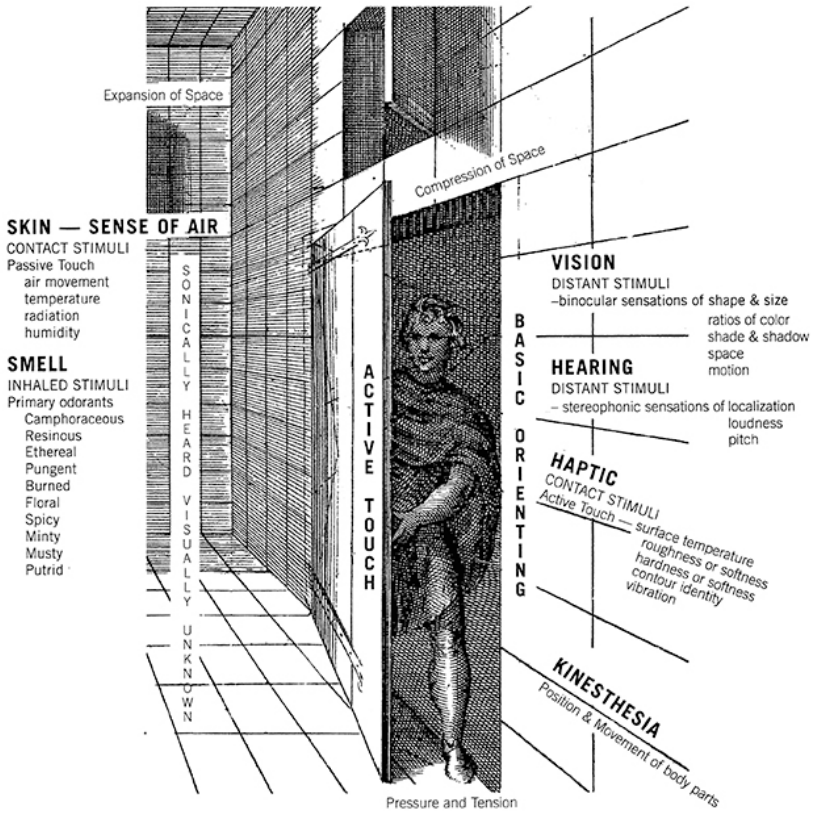

FIGURE 2: The senses in space. (Lupton and Lipps, 2018)

The senses lead us within a space and touch us from all kinds of directions. The body is a multi-sensing organism. As the brain combines different modes of information, the senses mutually change one another, according to Lupton and Lipps (2018, p. 10). This shows that we completely rely on our senses to collect data and our minds to interpret its findings.

Therefore, without the senses we are merely lifeless objects, not processing, developing, or evolving. So, it is an innate fundamentality that our senses continue to develop and cause the creation of new neuronal pathways in our minds.

Moreover, all creatures and humans are different from each other. Our senses are unique and personal to ourselves. Designing and creating spaces that embraces human diversity and individuality would create personal experiences, memories, and self-reflections for the inhabitant of the space. It is how things shape us like our emotions, our imagination, and our behaviours. So, designers should approach this by imagining places to be lived in, and for the relationship of the occupant to his dwelling in which every space tends towards an awakening of the deepest recollections of the self, as told by Maurice Sauzet (1989, p. 153).

However, as phenomenology preaches that perception holds a vital role in experiencing the world around us, 'sensory design rebels against the tyranny of the eye' (Lupton and Lipps, 2018, p. 14). The West has a particular obsession when it comes to 'ocularcentrism' and how the visual form dominates above all else. The flaw in this Western judgement is that it undermines the other senses, like touch, taste, and hearing that also contribute to comprehensible information when they are paired with vision.

The senses allow a space to be interwoven with time. This condition makes for an intimate and imposing experience of a place. For example, reflections can duplicate space and cause it to construct visual echoes (refer to Figure 3 as an example). So, the multiplying of matter can

make it feel like the multiplying of time. The vastness of a space is therefore unparalleled and contributes to the experience of ‘phenomena’. Lupton and Lipps (2018, p. 17) provide an example: windows puncture walls and expand space. Therefore, the distortion of space and time is one way that influences our senses. On the other hand, Pallasmaa (2009, p. 17) emphasises that the capacity to imagine, to liberate oneself from the limits of matter, place, and time, must be regarded as the most human of all our qualities. So, the construction of a space relies on our senses and imagination to interplay with one another. Designers can use this understanding when creating spaces that form an illusionary experience.

FIGURE 3: Mirrors cause the expansion of space - Casa Morgana, J. Mayer H. (Montjoy, 2023)

Chapter Two – Influential Design Factors

The basis of creating any impactful design is having the skillset and knowledge of how mainstream design factors are utilised and incorporated when constructing a space. How it influences our movements, our senses, our understanding, and our creativity is important. As stated by Brooker and Weinthal, (2017, p. 524) that colours, acoustics, and light carry qualitative and emotional weight in the perception and creation of interior space.

The main foundation of interior design derives from the notion that 'form follows function' (Bennet, 1977, p. 04). This concept emphasises that there is always a rationale behind interior and architectural designs. Therefore, the designer places priority in the initial use of the space as well as the consumers end. The assessment basis surrounding an interior is constituted by health and safety, function and performance, comfort and aesthetics (Bennett, 1977, p. 11). However, there are important design factors which an interior designer can deliberately adopt to create spaces which enhances the user experience more effectively than others. It is critical to keep in mind that there are ethical and moral guidelines when a deliberate utilisation is done with mainstream influential design factors. As Raskin (1974, pp. 117.118) objectively points out the perpetration of ones' actions towards ones' fellow man. Moreover, are users aware of manipulative design factors and its possible impact on their senses and experience? The following parts will explore the impact and role design elements have in creating atmospheres of a space and the manipulation of user's emotional responses.

Design Factor: Proportions and Beauty

The interaction between humans and the world lays on the foundations of proportion and scale. Vitruvius (1826, p. 12) expresses that proportion is the agreeable harmony between the several parts of a building, which is the result of a just and regular agreement of them with each other; the height to the width, this to the length, and each of these to the whole. This means that when designing and constructing a space, it is vital that the designer strikes a balance between all aspects of the thing being built. The ability to pay close attention to all the forms coming together and noticing miniscule details that can drastically alter the way a matter is being perceived (in terms of scale and proportion), is a skill designers must acquire. This way they can take control what people experience.

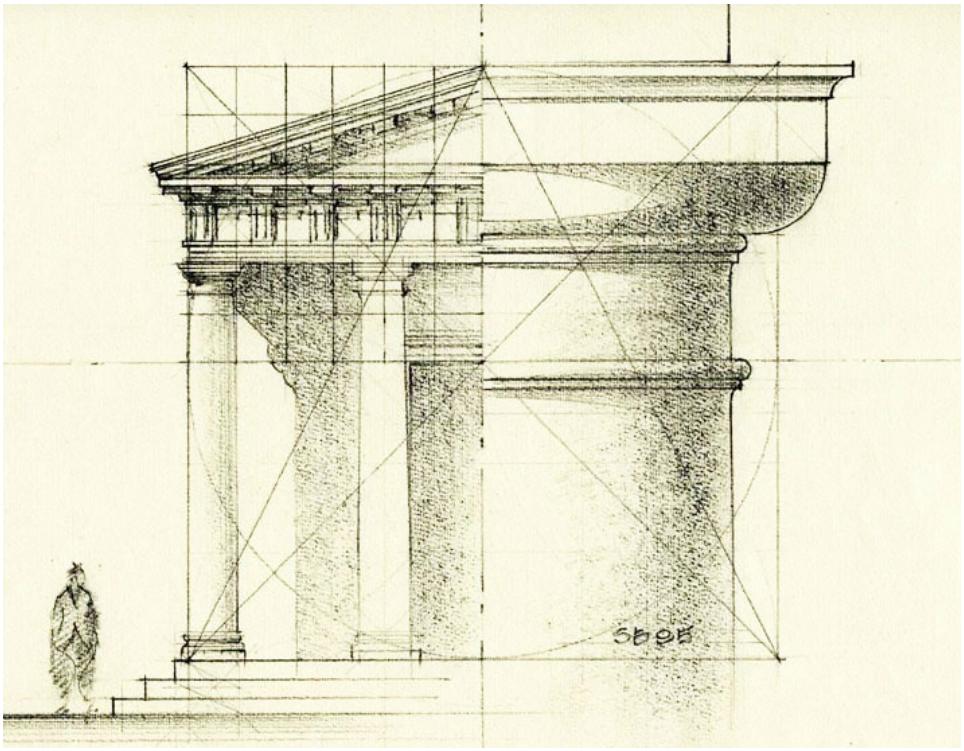

FIGURE 4: Theoretical proportions and symmetry. (classicist.org, 2018)

Aesthetics and beauty play a critical role in the atmospheric ideals and the perception of a space. People are conditioned to seek objects and matter that are attractive to their senses and understanding. Vitruvius (1826, p. 15) sates that beauty is produced by the pleasing appearance and good taste of the whole, and by the dimensions of all the parts being duly proportioned to each other. Proportion in architecture and design has always been associated with beauty. Thus, Vitruvius' sentiment is that design should continue in that direction, where small- and large-scale adjustments to the proportions of a space should be made. In turn, the manipulation of this factor gives a sense of comfort and reassurance to the eye.

However, Uvedale Price and Richard Knight pioneered in Landscape design, where they introduce the theory of 'Picturesque and Landscape'. Mallgrave (2010, p. 51) expresses that Price prefers a sentimental and emotive architecture, one which initiates a rapport with the irregularity and roughness. This contradicts Vitruvius's (1826) opinion that beauty and proportion should be the focal point and inspiration to the practice of design. So, the idea that an interior can have a character in 'richness and variety' and 'striking effects' (Mallgrave, 2010, p. 51) which would primarily appeal to the senses and consequently evoke sentiments (Mallgrave, 2010, p. 49). This implies that there is a profound quality and aesthetic in the opposite of beauty, as well as beauty itself, and this encounter of 'beauty and picturesque' transforms a person's preferences.

So, beauty defined by predecessors as either proportional or of 'smooth and gradual variation' is a limited definition, as argued by Price. Beauty is also found in the natural, irregular, and imperfect presence of forms and elements. As emphasised by Mallgrave (2010,

p. 46) that if beauty is associated with things that are young and fresh, the picturesque is associated with age and decay. This is an alternative design method that designers can embrace when creating a space; like the 'disposition of objects, which, by a partial and uncertain concealment, excites and nourishes curiosity' (Mallgrave, 2010, p. 46). This mode of using 'beauty and the picturesque', gives diverse sensorial encounters to the user.

Design Factor: Light

As every individual has senses unique to themselves and forms a personal understanding of the environment differently, it is acknowledgeable that certain design elements can be overriding than others. This implies that the ideas surrounding the 'uniqueness of the senses' discussed in chapter 1 have been reached.

When it comes down to the full or limited use of light, it can completely alter the ambience of space. Lighting can illuminate a certain form or structure to attribute importance and significance to it. Therefore, making it a focal point to the observing eye, and manipulates the user to exert a multi-sensorial response to its existence within space. For example, the interior design work of Steven Holl often celebrates a sophisticated interplay between light and shadow on his considered composition of forms (Brooker and Weinthal, 2017, p. 433) (see Figure 5). This shows that Holl deliberately experiments with light to adjust and manipulate the perception of matter in his work. Thus, light can also be a useful tool for designers to incorporate and experiment with in their own work.

FIGURE 5: The Nelson-Atkins Museum of Art, Kansas City. By Steven Holl. (Henkin)

Holden's (2000) theory of natural selection memory can be drawn on to discuss the use of psychological association as a controlled method when it comes to lighting. Through highlighting a specific space (as discussed above) or imitating a path via the use of natural or artificial light, the human mind finds correlations to that relationship and mimics that stimuli through physical motion. Hence, a force with a specific direction is generated, exerting influence on the user, and guiding their decisions regarding directional movement. Then again, the utilisation of artificial lighting can be intricately linked to the disorientation method, where it obscures rather than defines boundaries (Venturi et al., 1977, p. 46) within an interior setting.

As the notion of light is not directly tied to finishes and surfaces, but in generating a sensorial atmosphere, Venturi et al. (1977, p. 49) states that it can occasionally be perceived as 'anti-architectural'. Nevertheless, it is obvious that phenomenology and behavioural psychology coexist with lighting. It comes down to whether the designer utilises and strategically implements this design factor.

Design Factor: Acoustics

Referring to the importance of the senses in chapter 1, hearing plays a major role in the phenomenology of a space. Anderson, Goodman, Mulligan, and Regan established that there is 'an interaction of both setting's visual and acoustic characteristics that significantly influence the evaluations of that setting' (Ge and Hokao, 2005, p. 456). Thus, suggesting that sound and light interplay with one another, and disputes their separate individual presence within a conditioned space. Therefore, to utilise acoustic elements within interior settings, certain factors must be taken into consideration.

The problem with incorporating influential design elements through sound, solely relies in the variables that effect that method. Tokunaga's (2013) outcomes showed correlations between 'reverberance' and 'ceiling height' (Galiana, Llinares, and Page, 2016). As a result, any implemented factors cause a change in their qualities. Taking such issues into account, designing a sensorial atmosphere requires the consideration of acoustics to be utilised as an influential design factor. Many interiors like theatres or events use acoustic solutions (such as cavity walls, panels, or embedded stereos) to alter the sound that the user of the space hears

and experiences. Therefore, not only does the designer manipulate the sound, but the sound also results in the manipulation of the space that it inhabits (see Figure 6). Which causes the user's senses to be triggered and stand ready to gain an experience.

FIGURE 6: Instruments in the Swiss Sound Box, Hannover – By Peter Zumthor. (subtilitas.site)

Taking an alternative approach to the utilisation of sound: what if sound is not manipulated in any way, shape, or form? So, does the absence of sound have any effect in creating an atmosphere? Bachelard (2014, p. 80) expresses the following:

> With what art, to begin with, he achieves absolute silence, the immensity of these silent stretches of space! "There is nothing like silence to suggest a sense of unlimited space. Sounds lend colour to space, and confer a sort of sound body upon it. But absence of sound leaves it quite pure and, in the silence, we are seized with the

> sensation of something vast and deep and boundless. It took complete hold of me and, for several moments, I was overwhelmed by the grandeur of this shadowy peace.

The mere comparison of sound with space can set the aura and tone of an interior setting. When sound is not utilised, it does not signify that a designer is not in control of the design process. In this case it is the opposite. By not deliberately manipulating sound, is a form of utilising the 'absence' of it. Whereby, the designer can create a space by giving a person the sensation of something infinite, immeasurable, and limitless.

However, a designer must also dive deeper than the surface level understanding of the way sound possesses influential attributes. Specifically, how is sound acquired and processed in the brain? Neuroscientific studies examine the way sounds are gathered and how the frequency of sound affects our perception and experience. Mallgrave (2010, p. 198) begins by stating the following:

> The perception of sound, for instance, is in many ways similar to that of vision. Vibrations in the air make contact with the functionally asymmetrical ear – first through the tympanic membrane or eardrum and then through the mechanisms of the middle ear, which in turn transmit the sensations into the cochlea. It is here that the first stage of sound processing begins, as sounds move across the basilar membrane and resonate with some of the 16,000 sensory receptors or hair cells in each cochlea.

The comparison that perception of sound has a correlation with the perception of vision, brings a new approach to the way one experiences the world. In the previous chapter, where

phenomenology argues the importance of ‘ocularcentrism’ or ‘hapticity’ (either with its interplay or individuality), neuroscience states that vision and sound have an identical method of information processing. Therefore, they work together hand in hand, and the impact is directly made on our senses (or rather on our microscopic sensory receptor cells) to absorb the affecting stimuli from the environment.

Moreover, Mallgrave (2010, p. 199) continues by expressing that imagined sounds engage the same neuronal circuitry as perceived sound. Does this statement provide a new unexplored territory to the way designers can stimulate a user’s senses? Well, it firstly underpins that sounds that are ‘imagined’ are technically non-existent. So, no direct impact is made from an external stimulus to the information processing in the mind, but an internal stimulus does have an effect. The brain itself can re-call a prior experience of sound and exert the similar response to the environment as the perceived sound would trigger.

The amalgamation of sound alongside other influential senses (such as hapticity and vision) appears to be a prime approach, especially as all senses react similarly to the environment. However, the utilisation of sound still seems to be slightly less prominent and insignificant compared to the influences inflicted on the other senses by the means of design elements. Hence, it is mainly used in creating a desired ambience and set an elusive tone throughout a space.

Design Factor: Materiality

In interior design, materiality plays an important role in the completion of a project. From the acquisition of characteristic knowledge derived from a tangible matter, it helps curate a space of tangible experience. A designer must have a 'material culture perspective' through 'everyday experiences' (Brooker and Weinthal, 2017, p. 37). As Mallgrave (2010, p. 203) encourages to experience the texture and the relative character of the material we engage. This emphasises the vital importance of forming a relationship with the material that is being experienced through the senses.

Moreover, finishes of texture and materials are mainly related to the haptic approach. Mallgrave (2010, p. 14) states that the material of building or design, either in its natural condition or with human labour applied to it – that is, it is material intrinsically attractive or impressed in some way by the human hand and brain. In other words, the touch enacts a pivotal role in material experience for both the designer and user. It portrays two methods of utilising materials: either by manipulating and exploiting matter from the natural environment, or by creating materials via the combinations of man-made produce (such as plastic) and other extracted substances.

Materials have different properties ranging from: colour, shapes, roughness, texture, temperature, weight, and density. Farrelly and Brown (2012, p. 55) state that a designer should ensure they have full understanding of a material's properties when applied in different contexts; for example, understanding whether the material is durable or fragile,

acoustically absorbent or resonant. Thus, meaning that different interiors will require different material attributes, and the appropriate utilisation of these materials in space will create an innovative atmosphere. To capture an interior's essence, the materiality must be operated on by revealing the inner beauty of its properties.

Materials also combine, layer, intercede, and connect with one another. The compatibility of materials is in the harmonious interactions, or the clashes of its use. It can breathe a strong ambience into an interior setting. Thus, materials define an influential internal ambience. As Zumthor (2006, p. 25) sates that materials react with one another and have their radiance, so that material composition gives rise to something unique (see Figure 7). So, designers can adopt this attitude of materiality, by imagining how its utilisation will transform an interior atmosphere.

FIGURE 7: Tree-trunk covered in concrete - Bruder Klaus Chapel, Mechernich - Peter Zumthor. (Zilliacus, 2016)

Design Factor: Colour

The diverse range and compatibility of colour has direct influence on the aura and perception of a space. Colour theory is based on practical guidance for the ways that colours can mix and combine for visual effects. DeLong and Martinson (2013, p. 35) states that colours, in their practical applications, are almost never seen as an isolated phenomenon, but are related with other colours. Therefore, colour combinations can be harmonious or contrasting interactions (view Figure 8). This instantly suggests that the approach via combining colours, is a more effective strategy to create phenomenal atmospheres.

FIGURE 8: Example of colour interactions; the inner circles contained in the bigger circles are identical, but they appear brighter or softer depending on the contrasting colours in of the bigger circles. (Cartwright, 2022)

Furthermore, the impact of colour is stronger and intense. This is because they are not experienced individually, whereas compared to the use of sound, a person can differentiate varying tones. As observed by Josef Albers “we are able to hear a single tone. But we almost never (that is, without special devices) see a single colour unconnected and unrelated to

other colours" (DeLong and Martinson, 2013, p. 35). This shows that our visual senses extract all colour information together, holistically.

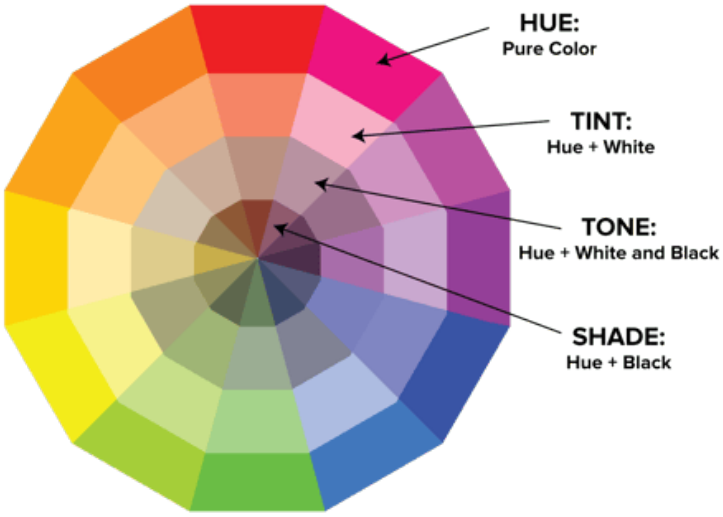

FIGURE 9: Colour wheel for: Hue, Tint, Tone, and Shade. (Cartwright, 2022)

Moreover, just like light and materiality, colour plays a significant role in the perceptual impact on users. Linking back to one's unique sensorial encounters in chapter 1, colour is experienced in a distinctive and individual manner. As by the words of Donald Kaufman and Taffy Dahl (Portillo, 2009, p. 43):

> In every second of observation, the interactions of light, surface, and human perception create hues anew. And Because sensitivity to colour differs among individuals, each person's perception will be unique in some way, based on what he has just perceived and all that he has perceived before.

Consequently, colour observations are not only unique, but it can derive from past experiences, encounters, genetics, and the preferences of a person. Designers can utilise

colour in a way they think is appropriate for the space, or perhaps, base decisions from their own biases. Yet, as perception and preferences are unique, then one's experience and comprehension of an interior is personal to them and vary from each other.

Interactions between light and surface also matter in the way colour is perceived. When colour is paired with light, designers can alter the appearance of it. This illusion is called 'metamerism'. As Portillo (2009, p. 54) explains through the following:

> A metameric pair is two objects that seem identical in colour under one light source but not under the other. The phenomenon arises from differences in the spectral curves of the objects being compared. The illusion emphasizes the integral relationship of colour to light to object, and it stems from differences in the physical makeup of colorants introduced in materials (e.g. paper, plastics, metals, and fabric) and their varied responses to light.

Therefore, an effective atmosphere can be created if colour, light, and material are in harmonious interaction with one another. Thus, utilising multiple design factors creates a stronger and powerful spatial ambience. But how does this influence our body?

Colour does have the power to affect a user's emotions and memory. It can trigger inherent biological responses like the quickening of breath and increase the heart rate. An example given by Portillo (2009, p. 140) expresses that a study of colour and emotionality indicated that green elicits the strongest positive emotions of calm, peace, and happiness. This means a direct impact from colour can be made on our internal feelings, far deeper than our sensorial

realms. If designers utilise this design factor in a meticulous approach, then the user's experience can be heavily manipulated. In turn, this creates the interwoven formation of memory, space, and time.

Chapter Three – Interior Critique

Following on from the evaluations of influential design factors, the analysis of two case studies will be presented in depth. The selection of each case study was based on the designer showcasing a pivotal manipulative element, or a harmonious use of multiple influential design factors within their design. The analysis will critique the way design factors are incorporated within a space to create an atmosphere, and how these elements influence human perception and experience.

In addition, the case studies will be portrayed through annotated photographs and site images to give a visual understanding of the process. This enables for the comparison of each site based on the sensorial effects of users regarding the ambience created by influential design factors.

Case Study: The Therme Vals – Peter Zumthor

The Therme Vals (1996) is a contemporary spa resort located in Switzerland and designed by the Swiss architect, Peter Zumthor. The site possesses philosophical and psychoanalytic atmospheric conditions and translates rational sources such as geology and landscape into poetic reality (Brooker and Weinthal, 2017, p. 534). Thus, the project has an integral relationship with proportions, scale, beauty, light, acoustics, materiality, and colour.

The site is submerged in the mountain and the roof is concealed with the plants of alpine and grass. So, it blends with the landscape, but its presence is only revealed by the geometrical

pattern that the grass-roof is adorned with. The only circulatory approach is by walking through a tunnel that extends from the pre-existing hotel site. As the commission refused an upwards build of the Vals, Zumthor responded by digging and sinking his building into the slope to avoid spoiling the view of the guests in the main hotel.

The structure is interrupted by grand windows, wide openings, and terraces. Yet, it lacks exterior doors. Open and free flow of movement is encouraged amongst the locally quarried Valser Quartzite slabs. Thus, moving from one plane to another means the interchanging passage from an open space to a more intimate one, with its play of light and shadows. The 'younger clientele, less well-off, come to Vals to relax, rest, and attain a certain physical well-being rather than seeking a cure from the waters' (Ni Co, 2014). The Vals' atmospheric conditions alone, fit a broader audience that have varying personal needs within the space.

Zumthor states himself: 'My way of inventing […] begins with a strong image […] and visualisation of a bodily or physical event, not an abstract idea' (Ni Co, 2014). So, the Vals is designed with intention and deliberate use of design elements to create an enticing atmosphere. The façade with the alternating empty and full spaces is comprised of fifteen simple units, all different from each other, and has a large protruding roof section. These units come together to form the site's entire structure and is separated by gaps of eight-centimetre glass joints to protect any infiltration accessing the building. Thus, these gaps create a dual impression of the roof, it seems heavy, yet each section of it edged by lines of light, seems to float in mid-air (Ni Co, 2014).

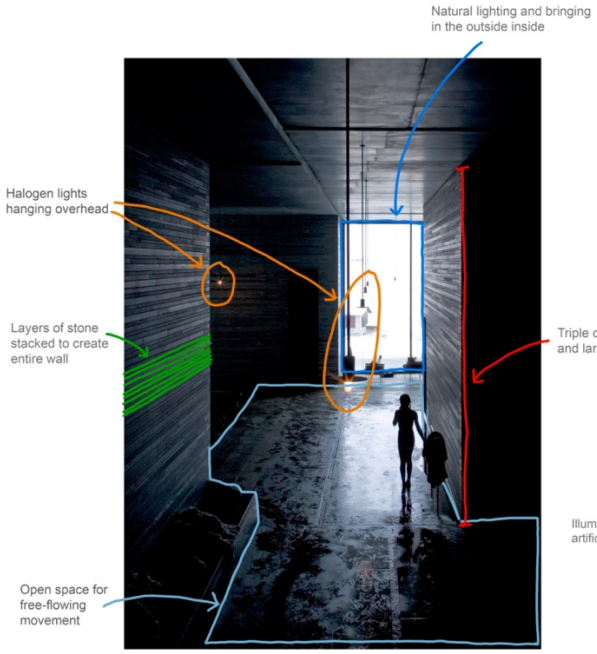

FIGURE 10: The Therme Vals - Intrerior. (Frearson, 2016)

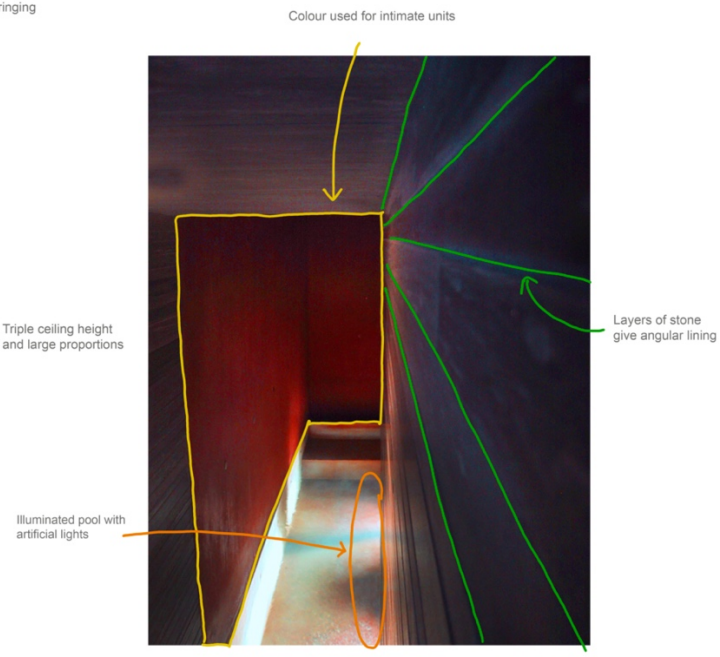

FIGURE 11: The Therme Vals - Private space. (2009)

The colossal exterior contrasts with the intimate volumes of every unit. Then, the implementation of colour with tinted concrete for the walls and a fine terrazzo flooring, clashes with the monochromatic grey-stone building. The colour relation of the building itself to the surroundings, juxtaposes the positive emotion emitted from the green colour of nature (as discussed in chapter 2) and the heavy feeling derived from the grey-colour façade. Yet, both colours work in complementary unison to create a serene atmospheric environment that one associates the term 'relaxation' with.

The unique relationship a user builds with water is personal at every encounter. Zumthor creates a solitary sensation in every unit (see Figure 11), for example with the forty-two-degree centigrade, the water's temperature on the skin is identified with the colour red. 'You

can taste the water, listen to the music of the stones, have a steam bath, or take a cold plunge at fourteen-degree centigrade' (Ni Co, 2014). The inhabitants of the site can determine their own route to discover the experiences of the restorative water therapies (Brooker and Weinthal, 2017, p. 535) that are cooled and heated accordingly. Thus, there are tremendous health benefits that derive from the minerals in the water and the Quartzite stone, which makes this a richer experience.

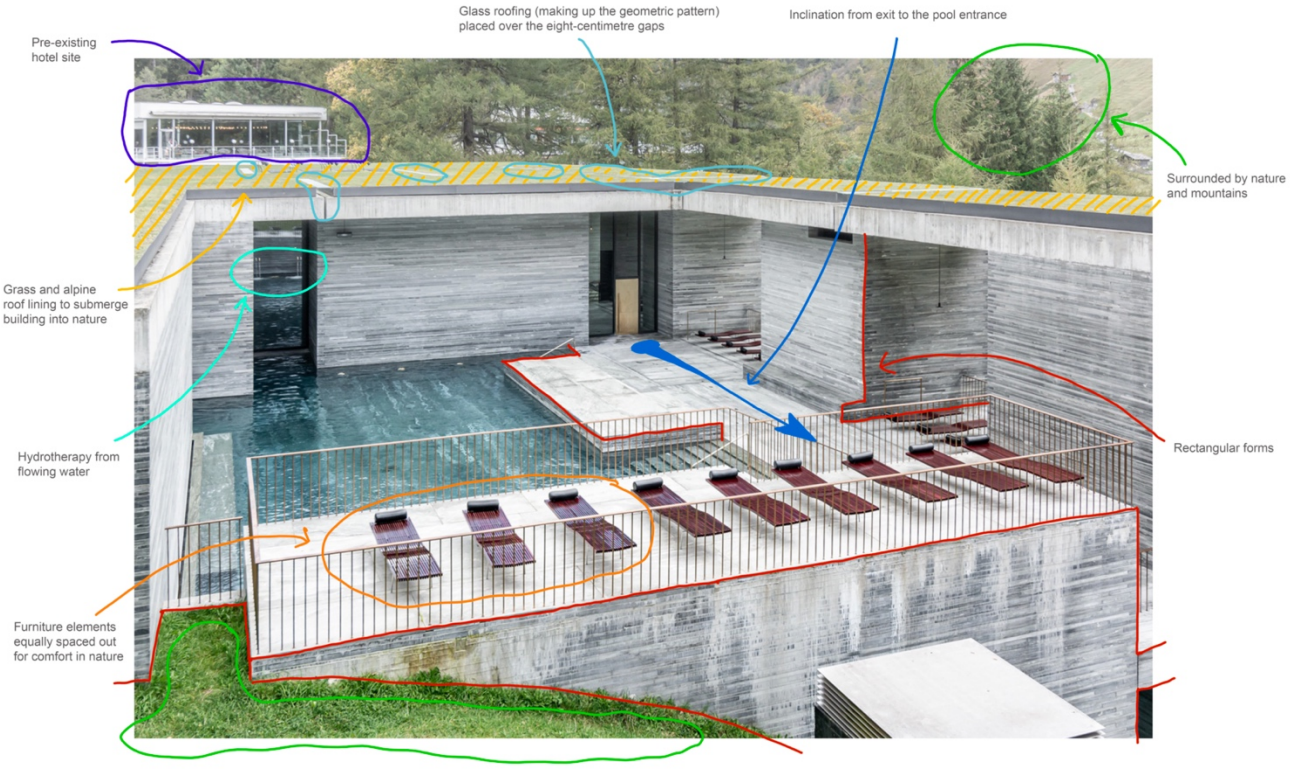

FIGURE 12: The Therme Vals - Backside structure. (2009)

Together, the users can utilise their voice to explore, challenge, and experiment with the acoustic boundaries of the space: the echoes, the vibrations, and the frequencies. A 'call and response' relationship is formed between the building and the inhabitant, like almost having a

conversation with one another. Moreover, the hydraulic sound of water gushing and flowing out into the pool soothes the brain and soul. Essentially, giving the sense of 'peace and mind'. As Zumthor (Ni Co, 2014) describes that he finds 'it incredible to have spaces that have presences or atmospheres, that are surrounded with specific materials, where the shell of the building is like an instrument'. The intention is evidently to create a symphonic unison of both man and building.

Ludwig Mies Van der Rohe quotes that 'God is in the details', and this is true when it comes to the finer features of the Therme Vals. Zumthor deliberately creates a landscape of fault lines and cliffs where the volume alignments are out of proportion with the human size (view Figure 12). The methodical layering of slabs at different widths forms the vast stone walls. Yet, they appear smooth and blank to the naked eye from afar. It creates a haphazard-like illusion to the user (see Figures 10 & 11). Ni Co (2014) expresses that Zumthor has created a vast symphony in stone, but the body of man marks out its time. Where the traces of wet footprints and handprints grace the floors and walls of the Vals, and the presence of a user is momentarily captured in space and time. Even when the site is compared to the enormous mountains that isolate it, the user is reassured by the thin layers of stone that can be grasped in the palm of their hands.

FIGURE 13: The Therme Vals - Perspective.

(Frearson, 2016)

FIGURE 14: The Therme Vals - Private space.

(Frearson, 2016)

The Therme Vals, part water and part stone (as shown in Figure 13), each create an experience of the site by its alternating sensuality and austerity. There is an immobility of the parallel lines and the glistening reflections of the water, and the in-between of the dreary grey colour and the play of the light. Just as Reuber (2002) expressed that the halogen lighting from overhead- the ceiling is black- reflects like candlelight off lacquered mahogany panels. The architect uses these poetic contrasts of cold and hot, light and dark, monotonous and bright, sensual and powerful. The user is constantly confronted with these elements, and it forces them to face what surpasses them. In Zumthor's words: 'I enter a specific world that bears the imprint of someone who invented and felt it for me' (Ni Co, 2014).

The Therme Vals solicits the five senses with each function and feature of the whole. The rich and manipulative staging of design elements conceals great mystery underneath its visible intricacy. So, it is almost impossible to escape the presence of the architect, as the building is designed with the intention that the user can experience the phenomenology he sustains within the space.

Case Study: Church of the Light – Tadao Ando

The Church of the Light (1989) built in Ibaraki, Japan, is a notable Christian church in post-war religious architecture. The architect, Tadao Ando, designed the chapel with the objective of having a restrained ambience in the congregation and alter. This is created with the intricate utilisation of design factors: light, proportion, acoustics, colour, and materiality for the structure. According to Hasler (1997, pg.72) the church holds a spiritual conception of space; thus, an explanation for 'emptiness' is expressed.

The most significant feature of this chapel is the crucifix-carved opening in the side of the building, and this 'crucifix of light' acts as the principal daylight source (Tawil, 2015) (as shown in Figure 15). Natural light is reflected from the ceilings and the walls by glass, light, and concrete. This enables the even distribution of light throughout the interior. As the light specifically requires a smooth wall to get effectively refracted and reflected so that its resplendent, corporeal manifestation in the heart of darkness can be realized (Baek, 2017). Dal Co (1995, p. 456) explained that Ando took extra measures to formulate smoothness from the perspective effect of light. When a visitor steps foot into the opening space of the

congregation and alter, one immediately becomes immersed and influenced by the light filtering the surrounding darkness from the hollow cut-out crucifix. Ando expresses that in all his work, light, is an important controlling factor. (Tawil, 2015).

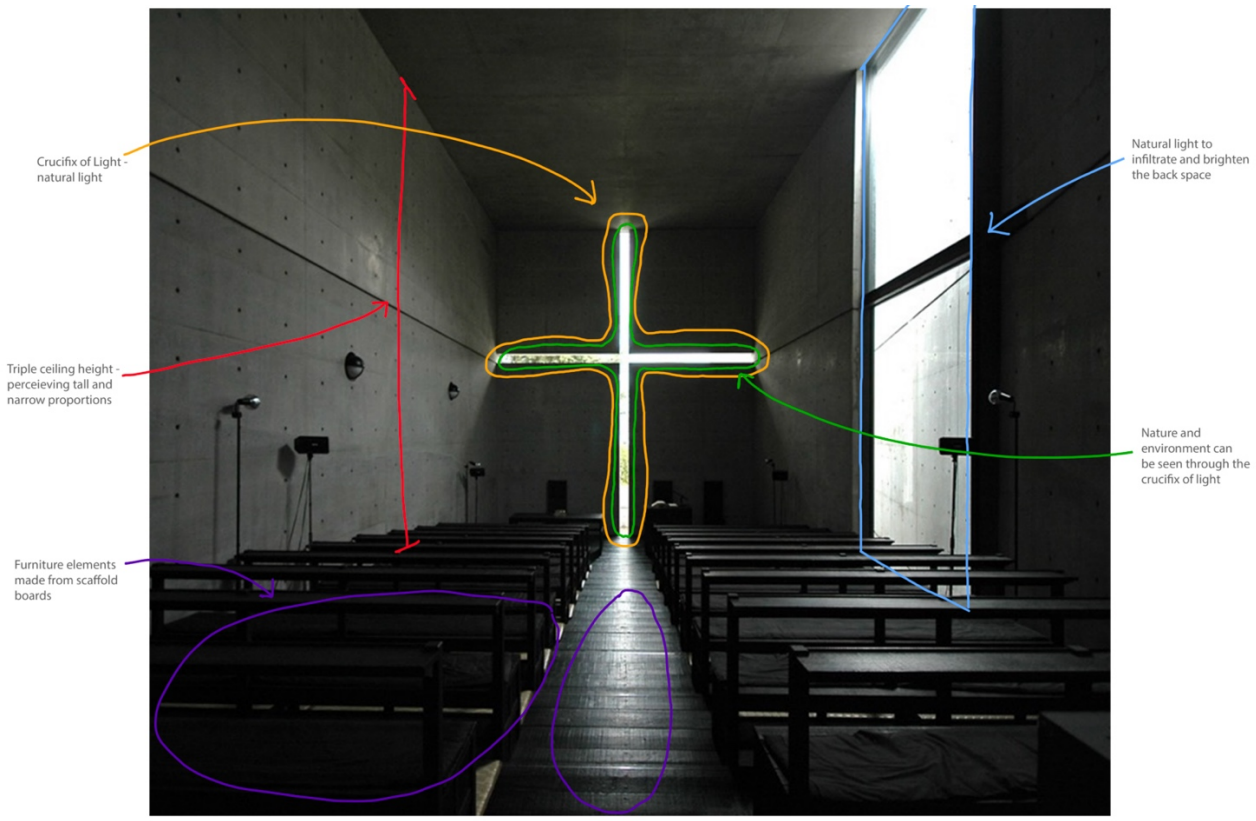

FIGURE 15: The Church of Light - Interior view of the alter, congregation, and the crucifix of light. (Chris, 2012)

The circulatory entrance to the church is deliberately indirect, whereby it forces the visitors to access the site from the north-east corner. The path of entrance is manipulated by a diagonally intersecting wall that forces the person to turn and skip forward in a convoluted ‘s’ movement through the opening of the exterior wall of the church (Tawil, 2015) (as seen in Figure 16). The route then leads to the second high-rise doorway in the diagonal wall that cuts across the structure at a fifteen-degree angle. This wall does not touch the main building, which gives a floating and hovering effect to the restrained spatial atmosphere. The high

ceiling, the descending floor from the entrance point to the alter, and the rectangular form of the building creates an inclusive and hospitable experience for the visitor. This emphasises that the use of proportions aids the seriousness of a place of worship. Ando also expresses that 'the people who come to this church are very devoted and […] to create a place where people can put their hearts together, and […] see the light come through from the outside; I made this 'Cross of Light' in the hopes that people's souls and minds can be united by the light' (Tawil, 2015).

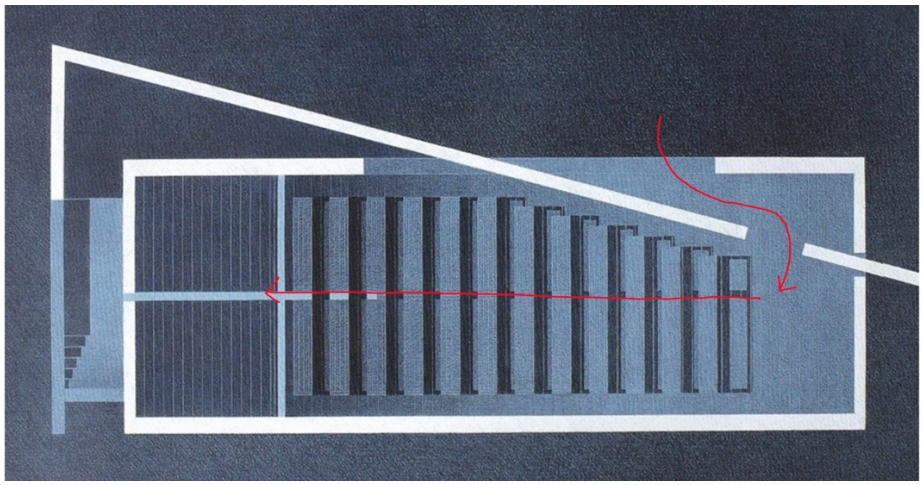

FIGURE 16: The Church of Light - Circulation and 's' movement. (frand020, 2012)

In addition, the chairs and floor of the church were made of scaffold boards. This was the material used in the construction process of the site (see Figure 15). The way this material was utilised in the creation of the interior, creates an immensely elusive aura, as compared to the monochromatic grey concrete used for the walls. Hence, Ando utters that this collocation is what defines an 'architecture rich in character' (Tawil, 2015). A place where people can come together and think about the world, the human, and the history.

The light which penetrates through the crucifix brings a thermal atmosphere to the space, as the church was built without insulation. However, the cold temperature which inhabits the interior has a cultural and spiritual significance: it keeps the believers awake and alert (Baek, 2017). The darkness and the cold do co-exist within the space, but the crucifix of light overpowers their presence. Thus, a dual ambience is created. It brings in warmth and brightness to the space, while providing the worshippers with the sensual feeling of being blessed in health, faith, and strength. Ando states that it is a place where you can use the five senses (Tawil, 2015). The visitor can sense others by the use of light, they can sense through the hearing of sounds and echoes that bounce off from the walls, and spiritually feel the atmosphere.

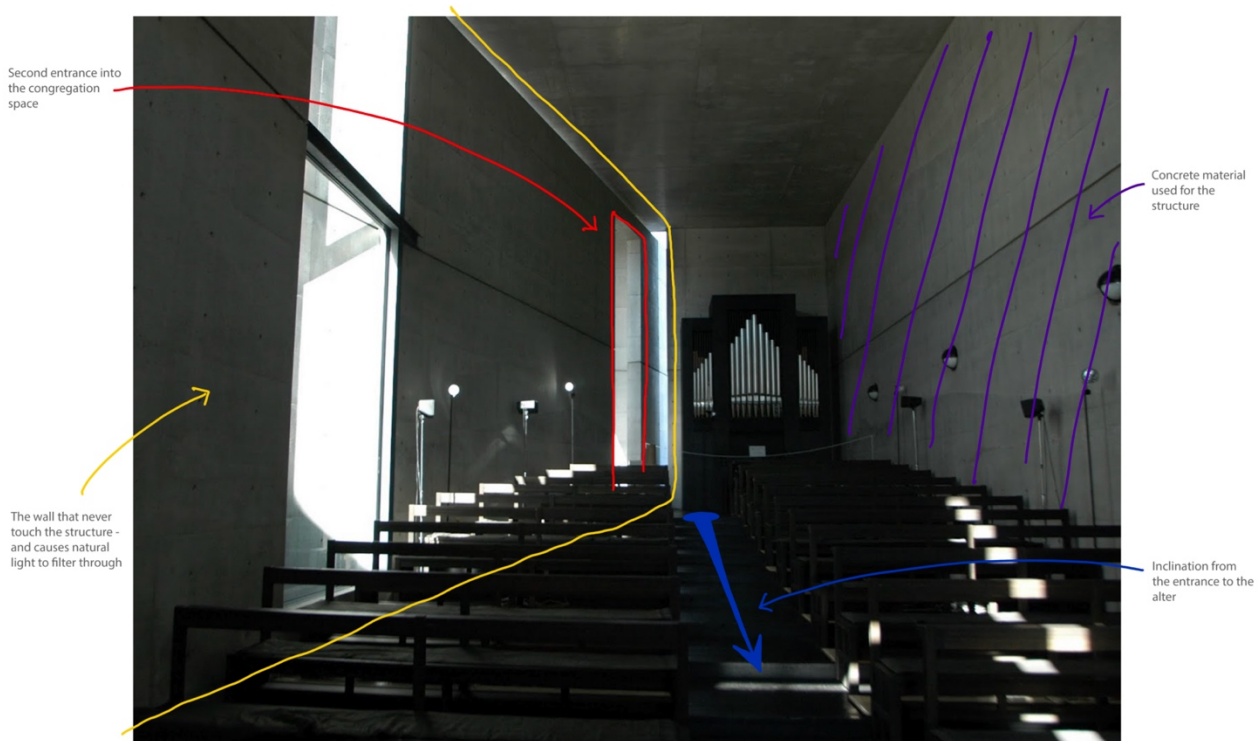

FIGURE 17: The Church of Light - Back view of interior. (Chris, 2012)

The church is engulfed in juxtapositions with the fusing of opposite spatial concepts and fluid transcendental architecture. There is a contrast between light and dark, solid and void, stark and serene: creating a dual atmosphere as mentioned before. Moreover, nature is brought inside via the crucifix of light and towering window, as Ando wanted man and nature to confront one another within the enclosed, internal world of his structure (Tawil, 2015). This creates a tension between both the inhabitant and the architecture, which is then resolved in the nothingness and emptiness of the internal space.

FIGURE 18: The Church of Light - Diagonal wall and second entrance opening detail. (Chris, 2012)

The Church of Light greets the five senses primarily with the feature of the crucifix of light. In comparison to the Therme Vals, where multiple features come together to create the whole. The rich and manipulative use of light is communicated with the user and space. It creates an inescapable aura as light touch the surfaces of the building and the human skin. Thus, the structure is designed with the sole intention that the user can immerse themselves in their religious faith, as well as the architectural art.

Conclusion

Through analysing the factors that create interior atmospheres and the way this influences the user's senses; it proves that philosophical studies of phenomenology and the scientific studies of the senses play a significant role in the practice of design.

Even though five design factors were mentioned, after the analysis of the case studies, it is imperative to allude that certain design elements are used more often than others by designers. Following the examination and comparison of the theories of phenomenology and the senses, as well as forming an in-depth review of case studies throughout, it is evident that multiple design factors are utilised together to create the ambience of a space.

When creating architectures and designs to sway the inhabitant with multi-sensorial dimensions of the manipulated atmospheres, the designer can clearly implement the design factors in numerous ways for different desired outcomes. Both case studies, for example, showed this by influencing users of the space with proportions and structure, even though they used design elements in alternate methods. In the Therme Vals, Zumthor created a spatial structure that interchanges from public to private (and vice versa) to make all possibilities of relaxation and serene atmospheric conditions apparent to the user. Whereas, the Church of Light has a restrained, singular spatial structure, to prioritise the importance of faith, intimacy, and inclusivity attributed to the inhabitant.

In contrast, light as a contributing factor in curating an atmosphere, deemed to be more of a significant value in the work of Ando's 'Church of Light'. This can be confirmed as the crucifix shaped opening […] is the main light source for the interior (Tawil, 2015). Compared to the Therme Vals, where both artificial and natural lighting is used: both types of lighting for the pools, the halogen bulbs for the enclosed space, and natural light that leaks in and out of the whole. It created different, lyrical ambiences in various settings within the structure.

Moreover, with the use of materiality and colour, a tactile and perceptive interaction occurs to form a more intimate and personal relationship between the experiencing person and the space itself. As Pallasmaa (2009, p. 109) reassures that this hidden tactile experience determines the sensuous qualities of the perceived object. In projects like the Therme Vals, where primal concern is in curating the atmosphere for relaxation, ease, well-being, and tranquillity; then the extraction, placement, and finishes of the materials are deemed important to the designer and seems to appeal to the user the most. However, the Church of Light appeared to lack such consideration on materiality compared with the Vals, as the objective and intent for the space was different. If Ando placed emphasis on materiality, or specifically in ornamentation, then it would defeat his initial purpose of creating a very spiritual and earthy connection (Tawil, 2015) between the visitor and the space.

Another noticeable factor in the case studies would be the exploitation of sound. Zumthor uses acoustics of water, birds, nature, and the chiming echoes exuded from the user to construct the dynamics of the experienced space. Similarly, with the Church of Light, Ando

has knowledge on the importance of religious recitation and singing hymns (Tawil, 2015). Thus, creating opportunities for the visitors to have an audibly resonant encounter.

Ultimately, it is recognised on a microcosmic plane, that every influential design factor has been used in the various practices of interior design. When referring them to the phenomenology and sensory understandings, it is evident that users are influenced through their senses and experience the environment through externally manipulated stimuli. As this is a proven aspect of sensory phenomenology, it is encouraged that designers contemplate and utilise the additive and subtractive phenomena of colour, sound, physical sensation, and light that are the carriers of interior's atmospheric character and authenticity (Brooker and Weinthal, 2017, p. 537). Especially, in the cases where the business or client is observing to create a phenomenal ambience with deliberate intent.

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