



THE INFLUENCE OF THE SENSUAL ENVIRONMENT OF THE URBAN SPACE ON THE USERS

تأثير البيئة الحسية للفراغات العمرانية على المستخدمين

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KEYWORDS:

Space experience, multisensory environments, sensory experience, Human senses, phenomenological approach.

المخلص العربي: - يعرض البحث العلاقة بين الإنسان والفراغات المعمارية التي يشغلها ، وفهم إنطباعات المستخدمين عن البيئة المحيطة بهم. في البداية تم دراسة العلاقة بين العمارة والحواس البشرية، حيث ان الحواس هي الأدوات التي تربط البشر بالبيئة الخارجية، ثم تم تطوير الدراسة من خلال دراسة السلوك البشري والمشاعر والانطباعات البشرية حتى لا تكون مقتصرة فقط على الإحساس. ثم تركز الدراسة على إدراك الفراغ المعماري من خلال فلسفة علم الظواهر. أي عنصر، حدث أو تجربة يمكن للإنسان رؤيتها ، سماعها ، لمسها ، تذوقها ، الشعور بها أو ادراكها هي من ضمن علم الظواهر. وتم عمل دراسة تحليلية في منتزهات تحاكي الحواس . حيث العديد من الأنشطة ، من المعاملات الاجتماعية حتى مقابلات العمل. المنتزهات فراغات من خلالها يمكن دراسة تصرفات الأشخاص ومشاعرهم تجاه البيئة المعمارية المحيطة بغرض تقييم تأثير العناصر المعمارية على الإحساس بالفراغ. وأخيرا تم الوصول لمخلص للوصول الى التوافق بين الأشخاص والبيئة المعمارية المحيطة و الوصول الى تصميم محوره احتياجات الإنسان. وتم الوصول الى الاعتماد على منهجين؛ الحواس والمشاعر وتم التوصل الى سبعة قواعد إرشادية من خلال دمج الحواس والمشاعر مع العمارة

Abstract—The paper explores the relationship between People and the architectural spaces they occupy; understanding the occupants' impressions while meeting their surrounding environment. In the first place, the relation between human senses and architecture was studied, as the senses are the tools that relate people to the outer environment. The study was then improved through studying the human personality, feelings and people's impression not to be restricted only on sensations. The study then focuses on the awareness of architectural space using the philosophical field of Phenomenology. Any object, event or experience which a person can see, hear, touch, smell, taste, feel or understand is a focus for a phenomenological study. An analytical study was then directed in sensory parks, where different exercises are seen, from social skills to business. Parks are spaces where

human contact and impressions about the architectural atmosphere could be studied with the goal of evaluating the effect of architectural attributes on the atmosphere feeling of the space. Finally, a brief summary was put about how to obtain harmony between people and their surrounding in an architectural space, and designing with a user centered approach. It was basically depending on two main issues to think about when designing with a user centered approach; senses and emotions. And from the consideration of user's senses and emotions in design, seven guide lines were obtained.

I. INTRODUCTION

Architecture is the art of reconciliation between ourselves and the world, and this mediation takes place through the senses."-Juhani Pallasmaa (Pallasmaa, 2012)

Architecture is not intended to how a building appears only, but rather is joined with involvement and can impact client's

Personal satisfaction essential goal of architecture is to provide a container for user's activity, and while serving this

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function it compulsorily becomes the framework for psychological and emotional well-being of the user. Space is experienced when the human body moves, sees, smells, touches, hears and tastes the surrounds. The rhythm of architecture can be felt by inhabitants thus of the architect's composition – or arrangement of all the sensorial qualities of space and this layering of senses creates a building which can generate deeper and more meaningful ties with the occupant.

A. *The Problem*

With the development of technology, individuals are getting more confined from their environment while architecture could be more steady and contribute more positively towards the proper integration of man, and the encompassing scene. With the objective design ought to expect its part in recouping the engagement amongst people and their surroundings, planners ought not focus on the visual parts of buildings but should be thinking about the entire experience, and about obtaining harmony and a more significant connection between man and his surroundings.

B. *Objective of Research*

The target of this paper is to comprehend the issues required with creating a building that animates the senses to offer a more private association with space. It has its foundations in the hypothesis of phenomenology, in this manner its crucial ideas will be investigated at a base level, however phenomenology is an incorporating hypothesis that is excessively wide, vast and flighty a theme to dive into too profoundly on its own. Rather I have concentrated on what is at the center of phenomenological speculation — highlighting the experience of space. To do this I have centered in around the relationship between experience and its source (external stimuli) - which is mediated through the senses.

Phenomenology requires an increased receptivity of the considerable number of senses to heighten experience. Certainly, architecture is coincidentally instilled with multisensory stimuli. We see, touch, smell, taste, and hear spaces we occupy. However there remains the question of Intent behind these stimuli. Simply — has the designer foreordained what the real reaction of every stimulus intends to our experience of space? Any thought is, obviously, subjective — however by essentially considering sensorial qualities, there is a predetermination and expectation behind the material and spatial language utilized, and the implications this has on experience. Traditionally, vision (or aesthetics) more likely than not is considered, obviously - to a point where a sensorial hierarchy exists to our sensual experience of space. The

issue is while design, the way things are, is commanded by vision, alternate sensors stay over stimulated or under-differentiated. I share the feedback by phenomenologist's that this visual predisposition brings about homogenous and banal design without any lived, sensual experiences. "Sensual" infers an experience that satisfies the senses. 'Lived experience' suggests experiencing space physically, as well as mentally too. Phenomenology, alongside this paper, requests this mental and physical interaction with space, and as expressed prior, this is sustained through the senses. With our different senses quelled there is a stifled exchange between the body and the space it inhabits. See Figure 1 & Figure 2:

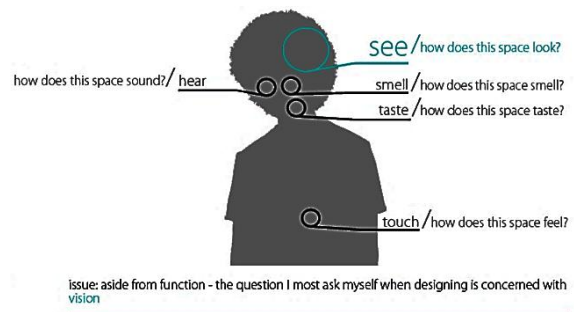


Figure 1- Depicts the hierarchy of the senses in architecture. Design decisions are predominantly decided aesthetically over experientially.

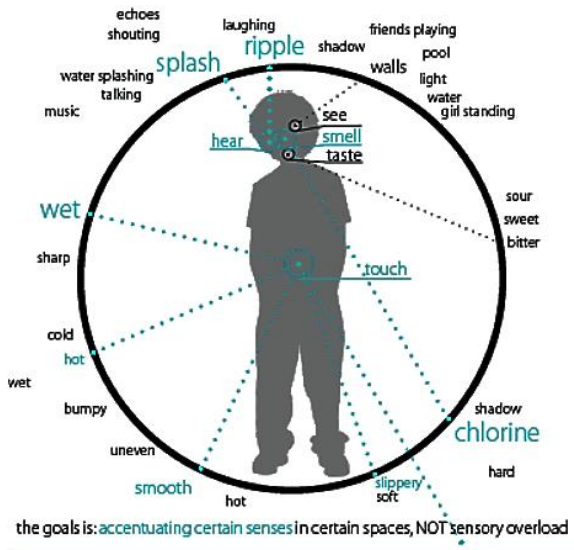


Figure 2- Depicts the design concept of tuning into certain senses, instead of bombarding them with a sensory overload.

C. *The Aim of Research*

Therefore, the aim of this paper is to reactivate our repressed senses through architecture to achieve a lived experience. However, this ought not be perceived as some shallow, superficial "plugging" in of the greatest number of

senses as we can into a space to reactivate the senses. This would have no experiential advantages and would just be an overload of sensory stimulation. Sensual noise if you like. In this way, the challenge will be determining not how spaces can simply meet the five (four, discounting taste) sense criteria checklist, but instead, when the opportunity to accent one of those viewpoints emerges, has it been treated with due priority. In this manner, there should be an outrageous sensibility in the treatment and use of materials, drawing upon their material, plastic and receptive qualities to summon important and animating engagement. The qualities of sight, touch, sound and smell are stimulated through experiences with materials, managing the emotional side of the brain to take over.

II. METHODOLOGY

The research is based on Pragmatic approach to research (mixed methods) which formulates the research methodology. A theoretical study in the field of cognitive neuroscience ⁽¹⁾ and its relation to architecture was conducted. The study concentrated on the human emotions and people's concerns, particularly from architecture. Some deductions were about people's impressions from architectural spaces and their relation to human perception and sensory experiences. This theoretical review was based on the work of famous theoreticians, David Hume Norman, Pieter Desmet, Juhani Pallasmaa ... etc. Then an analytical study has been studied to clarify the sensory experience in parks.

III. HISTORY OF REPRESENTING THE SENSES

In the Ancient Egyptian civilization, there was a very popular symbol of power which is 'the eye of Horus'. It is drawn in six sections that compares to the six senses; touch taste, hearing, thought, sight, and smell. The eye was viewed as the receptor of input and the six senses were viewed as the six entries from which to get information. The construction of the eye takes after exceptionally exact laws. The senses are ordered depending on their importance and how much energy must be eaten by the eye for a man to get a specific sensation. Touch was viewed as the most imperative and the one that can't be uprooted of the senses followed by taste, hearing, thought, sight and smell (Anon., n.d.) See Figure. 3.

During the Renaissance times, the system of the senses was related to the image of the cosmic body; vision was

linked to fire and light, hearing to air, smell to vapor, taste to water, and touch to earth (Pallasmaa, 2012, pp. 15-16). At the present the five senses form a hierarchic system from the highest sense of vision down to the sense of touch. See Figure.4

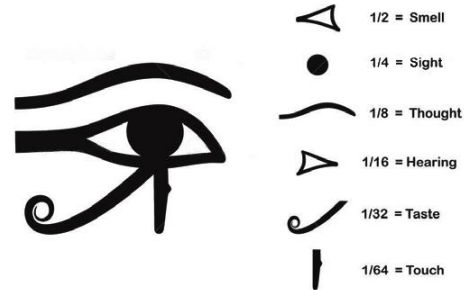


Figure 3- The Eye of Horus.



Figure 4 - The Greek Cosmic Body

IV. PHENOMENOLOGY IN ARCHITECTURE

Architectural theorists have tried to improve the awareness of architectural space using the philosophical field of Phenomenology. Any object, event or experience which a person can see, hear, touch, smell, taste, feel or understand is a focus for a phenomenological investigation. (Seamon, 2000). To experience the place as a phenomenon it is vital to understand how architecture impacts our impression of being inside a space. Phenomenology exhibited in architecture is the control of space, material, light and shadow to make a memorable experience of being inside a space and stresses on the reality of being in the world.

For Husserl, phenomenology is "the reflective study of the essence of consciousness as experienced from the first-person point of view" (Smith, 2008). Heidegger portrays the role of architecture in an existential sense as "to allow for a specific site to become a place (Norberg-Schulz, 1980). Christian Norberg-Schulz illustrates this through an understanding that for such a place to be successful, it needs a particular character, particular Genius Loci (The

prevailing character or atmosphere of a place) of a place. The particular character of the place therefore certifies us to stand inside that given space, and it is inside this particular zone where architecture can shape the physical parameters that people experience. (University of Kansas, n.d.)

A. *The Relevancy of Phenomenology to The Senses*

Norberg-Schulz in his book 'Virtuoso Loci' (1980) recommends that: "Phenomenology was conceived as a return to things as opposed to abstractions and mental constructions" (Norberg-Schulz, 1980, p. 8) at last contending for an architectural language that caters for experience, perception and stimulates the full affinity of our senses through an arrival to basic architectural components was lost in present day design. This move in enunciation places at the focal point of design and reenlists a space body dialogue by joining us with the constructed environment through an architectural language that advances closeness and is done by the human senses. The challenge lies not in a solitary sensory experience, but rather spaces that can stimulate more than one sense.

Pallasmaa states that "Every touching experience of architecture is multi-sensory; qualities of space, matter and scale are measured equally by the eye, ear, nose, skin, tongue, skeleton and muscles" (Pallasmaa, 2000). Multi-sensory stimulation is clarified by James J Gibson, not as far as our five senses as we probably know them, to be specific smell, taste, see, hear and feel, yet rather as collection of these. He describes them as five sensory systems that include visual systems, auditory systems, the taste-smell systems, the basic-orienting system and the haptic system (Pallasmaa, 2000, pp. 41-42) Lefebvre maintains that space ought to be experienced by means of the body which strolls, tastes, smells and essentially "lives" in a space, and not read (Wiles, 2003)

I accept there is a relationship between phenomenology and the advancement of the senses. If we interpret phenomenology in architecture as advancing the experience of space, and that, our body is the subject of these experiences then the possibility of the adjusting/increasing the senses is very useful. In any case, moving beyond the senses towards techniques that trigger and/or create emotions and memories is basic to the idea of phenomenology in architecture and ought to be used. One of the key viewpoints to phenomenology is that: basically, space is physically experienced, however is not recently physical space, it is mental as well. In other words, our experience of a space occurs in our imaginations as much as in physical reality. It's that, there is an undeniable intending to space. Since we are fundamentally beings that are spatial space as it is considered, translated and comprehended through the experience of the inhabitant is as genuine as the physical manufactured "bricks and mortar". Physical space is connected to a mental space through human experience. Along these lines, as an architect, I think you are part phenomenologist if you are interested in the sensory / imaginary /experienced aspect of the space you are designing. Hence, this paper takes this position, it is part phenomenology, it is an 'extended phenomenologist'

investigation in that it concentrates on the effect the senses have on our imagined/remembered experience of space. The challenge now lies by the way we make a multisensory experience, and as found in our present visual driven society, this challenge forced on architecture seems to be more mind boggling than any time in recent memory. "Today the depth of our being stands on the ice"(Steven Hall in (Pallasmaa, 2012).

Phenomenology theory has set up a progression of human experience that begins with the sense/stimulus: the senses interfaces with memory, memory is connected to perception, which then impacts one's capacity to comprehend and experience space and being. By looking at phenomenology in this light, it gives a chance to the architect to engage with the movement through the senses. Light, sound, smell, touch and taste trigger signals that are transferred to the mind, pictures of memory/imagination are formed, and the movement is set into motion. In this way, the senses, as a design element that can be used by an architect, shares the variable and elusive attributes of the human experience. See Figur.5

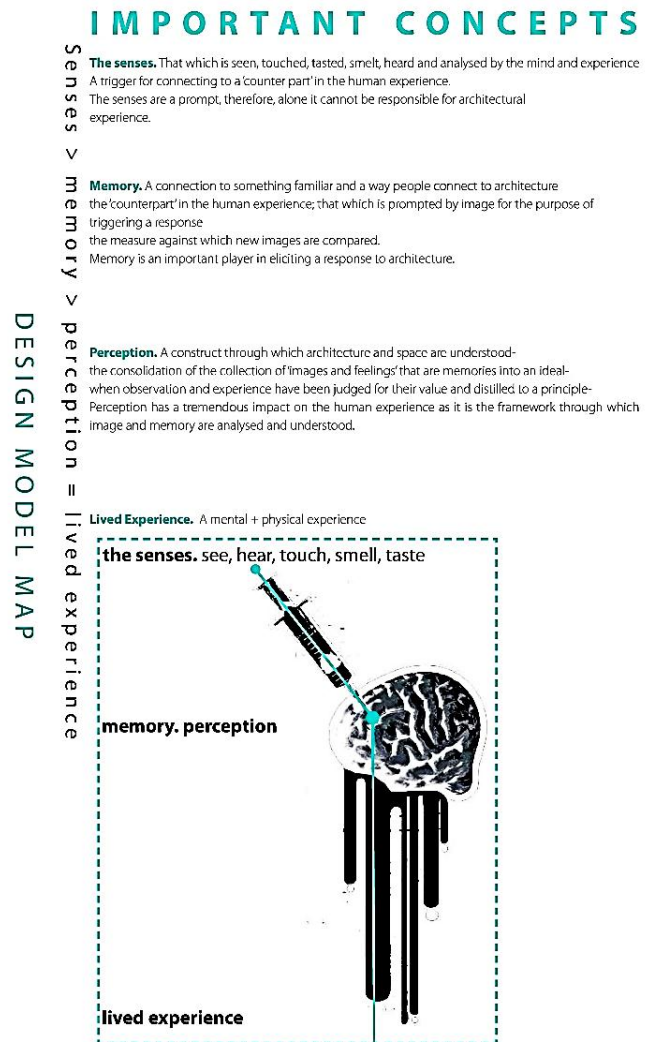


Figure 5- Design Model Map.

V. EXPERIENCING ENVIRONMENT THROUGH SENSES

A. Experiencing the Physical Environment

The physical environment refers to the endless visible and tangible features that are largely controlled by planners, designers and built environment professionals. The connection between people and the physical environment is linked not only to vision, but to all the human senses including smell, sound and touch (Gifford 2002; Veitch and Arkkelin 1995; McAndrew 1993; Mehrabian and Russel 1974).

Kevin Lynch (1960) identified five types of elements of the built environment that are capable of influencing how people experience and evaluate their environment: landmarks, paths, districts, edges and nodes. People respond to their surroundings based on two aspects, namely the visual aspects of city form, and the evaluative response that results from the human senses (Gifford, 2007). See Figure (6)

The urban environment can be experienced with reference to the buildings it includes, individuals who occupy it and the systems which associate different goals inside it. Urban environment can be controlled to produce significant experience, particularly at ground level as every one of human's senses connect together at close scale to experience built structures in a specific setting with due thought to viewpoint and distance. Also, we exchange the perceptions of intimacy, which means and emotional effect from our gatherings with individuals to our gatherings with buildings.

We also experience urban paths and networks depending upon the speed and mode of traversing. At the average human walking pace of 5km/h near details are observed and interpreted by various senses whereas in contrast is the 60 km/h architecture along the roads used by cars where details remain unnoticed. (Varming, 1970)

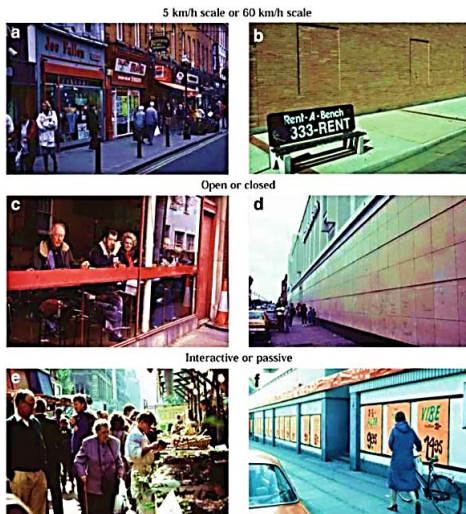


Figure 6 (a)- Urban scenes at eye level

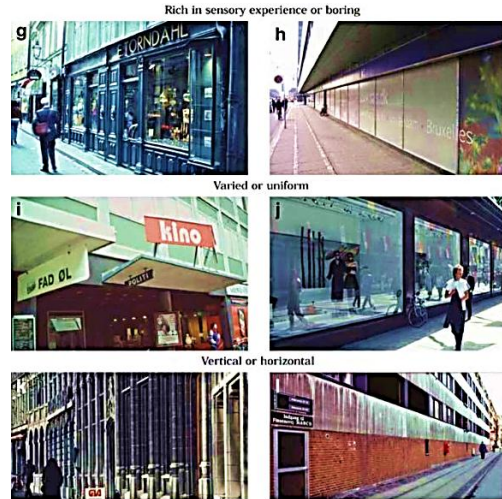


Figure 6 (b) Urban scenes at eye level

B. Experiencing the Ambient Environment

The ambient environment refers to the non-visual and non-physical elements of the built environment such as sound, smell, temperature and illumination and these are experienced through the sensory organs such as ears, nose, skin and eyes. Studies have shown that these elements can have reflective effects on mood, behavior, and physical wellbeing and later the overall experience of space on the users. (Gifford 2002; Veitch and Arkkelin 1995; McAndrew 1993; Canter and Stringer 1975; Mehrabian and Russel 1974).

1) The illumination of spaces

Illumination directly influences people's perception of space, can change moods and encourage or discourage individuals to take part in different activities. Illumination impacts are the primary thing we see around an environment. Light and shadow make a lively collaboration of color, texture and related feeling connected with the space. This part of ambient environment is detected by the sense of sight. Plato regarded vision as humanity's greatest gift (Plato 360 BC in (Jay, 1994)). Even today architecture respects sight as the most critical sense and stresses making of visually monumental buildings. See Figure (7)

It has also been recommended that under the cover of dark or gently lit settings, people tend to release their social inhibitions, more so than they would in brightly lit settings, by engaging in acts of familiarity, aggression or impulsive behavior (McAndrew, 1993); (Mehrabian, 1976). This is interesting in that it may explain why people tend to avoid dark public places at night time. Perhaps there is a conscious or unconscious acknowledgement that strangers may behave differently under the cover of darkness and that personal safety may be compromised.



Figure 8 - Transforming a space through lighting, Salk Institute.

2) *The temperature of spaces*

Temperature has been found to effect human behavior by directly influencing their psychology and subsequently has a main role in how the users experience space. Temperature of a space is felt by the skin on a physical level and translated by a complex psychological process. It is also passed on tactile sense, such as touching a stone wall may feel cold on certain days.

3) *The sound of spaces*

The sound of spaces is experienced and understood by sense of hearing. Brebner proposes that while physiologically, the system of hearing is the same; mentally it contrasts in view of factors, for example, the intensity, predictability and significance of the sound and other enticing components. The acoustics in a space add character to the space and give it a specific sort of dynamism. Building connects with the user specifically by resounding or giving back the sound a man makes while walking through it. Sense of sight implies exteriority but sound creates an experience of interiority (Pallasmaa, 2012). One of the most stirring auditory experiences in architecture is absence of sound i.e. silence which corresponds to very specific experiences.

4) *The smell and taste of space*

Smell of spaces is often the most sensitive of human senses and often the most neglected one. This is additionally a sense which works for the most part with inter layering of different senses. Regularly unpleasant smells are initially distinguished by sight, and afterward recognized by their smell (Brebner, 1982). Smells can be gotten from various sources e.g. the regular, built or human environment. Smell has an exceptionally extraordinary impact on memories and is regularly translated regarding society and convention. (Brebner, 1982); (Jakle, 1976).

Each environment has a smell of its own and owes it to the function it serves, activities that occur in it and the material that forms it. The structure invites and embraces these smells through the careful arrangement of the building nearby and its components, for example, doors and windows, porches and kitchens. According to Pallasmaa There is an unpretentious transference between material and taste experiences. The human tongue can just recognize among 7-8 particular sorts of taste, while the nose can recognize among several substances, even in minute. Olfaction intensifies the sense of taste. This rule is additionally can be used to taste in architecture. It becomes obvious that there is not an exacting taste of design since the fairy tale of Hansel and Gretel. Also, still design can stimulate the feeling of taste. Vision progresses toward becoming exchanged to taste. Specific colors and soft details bring out oral sensation. A delicately colored, polished stone surface is subliminally sensed by the tongue” (Pallasmaa, 2012) So the taste in architecture does not truly mean to stoop down and attempt to eat the stone bricks, yet it implies that architecture can make our mouth water just by seeing engaging materials.

5) *The sense of touch*

The eye is the organ of separation, though touch is the sense of nearness, closeness and love. The eye watches and explores, while the touch methodologies and feels. Along these lines, when the light makes space for shadow our different senses are honed including the sensitivity to touch. The skin peruses the texture, weight, density and temperature of matter. The tactile sense associates us with time and traditions (Pallasmaa, 1994). Human touch is the immediate interface of architecture with the user. Materiality of environment gets to be distinctly essential in this context and plays a critical part to a great sensory experience.

It is the Architect's job to consider how the clients' feet contact the ground, and how will users experience that in the place that architects design. When it can produce totally different experiences; walking on sand is a totally different experience from walking on a wooden floor, both give an entirely unexpected experience from walking on a porcelain floor. In Japanese gardens tiles and stepping stones are designed to be walked on with wooden clogs, and after that these clogs are taken off before going into the house where the floors are covered with matting and everything is made of wood and paper and other friendly materials that are sympathetic to the touch. A case of a Japanese garden is in Figure (8)



Figure 9 - Japanese Garden.

Texture effects the feeling of touch and can be utilized for various reasons in architecture. One of these reasons is to demonstrate change of level, or show change of zones like the case in (Figure 9) in Athens below the acropolis where there is a clear urban ground flooring division; the path on the right leads to the acropolis and the herodion theater, and the path on the left leads to a church. Change of texture can be utilized as no trespassing area as well; coarse gravel that can't be stepped on around an open-air statue display, coarse steps can be utilized to keep away from slippery floors also. Texture can be utilized too to control glare, smooth surfaces sparkle and reflect light. Lastly, alternating smooth and coarse surfaces can be utilized to treat weariness in a long elevation.



Figure 10 - Flooring Division below the Acropolis in Athens

In addition to the above-mentioned senses, Haptic sense, sense of time and distance, speed and movement also plays an important role in sensory experience

VI. MIND AND EMOTIONS INFLUENCES IN THE BUILT ENVIRONMENT

The interaction between people and the built environment does not only depend on the reception of stimuli through the five senses; seeing, hearing, touching, and possibly even tasting. People develop cognition of the

built environment and architectural spaces through the mind and emotional influences as well.

A. *The Dialectic Relationship between Architecture and The Human Mind*

The relation between the human mind and architecture can be abstracted in the influence of architecture on the mind and conversely the influence of the mind on experiencing architecture. "Architecture has the most impact when the ideas used in building design reflect our understanding of how the brain reacts in different environments." (John P. Eberhard, April, 2004)

It comes to believe so strongly in architecture's ability to influence the mind as in Louis Kahn design the Salk Institute in La Jolla, California, as a scientific facility that would stimulate innovations and inspire creativity see (Figure 10). For example, the institution has an open plaza with a narrow strip of water that runs down the center, shown in (Figure 11), linking the buildings to the vast Pacific Ocean so it would direct a person's view towards nature, reminding people of their scale compared to that of the ocean.

And due to zoning codes, the first two stories had to be underground, sinking the laboratories in the courtyard. For these spaces to receive ample sunlight, Kahn designed a series of light wells on both sides of each building that were 40 feet long and 25 feet wide, shown in (Figure 12). The laboratories above ground are also well-lit spaces with large glass panes for their exterior walls. (Anon., n.d.)

Figure 11 - Salk Institute.
(www.archdaily.com)Figure 12 - Salk Institute Plaza.
(www.archdaily.com)



Figure 13 - Salk Institute Underground Floor (www.archdaily.com)

B. Emotional Influences on Architecture

Emotion that gives meaning to our lives and our lives are ordered and organized by our needs, motives, and concerns. Human actions are motivated firstly by biological needs to be achieved, secondly by social goals, motives and plans that issue from them. And it is built in people then to detect or evaluate if their internal state or the external environment is beneficial or harmful to their plans. Emotions translate the concerns into goal directed actions. (Christianson, 2014)

“In the experience of art, a particular exchange takes place; I lend my emotions and associations to the space and the space lends me its aura, which entices and emancipates my perception and thoughts.” (Pallasmaa, 2012) Architecture is not experienced as a sequence of isolated images, but as a fully integrated material and spiritual essence. Architectural spaces have specific airs which impact the emotional condition of a man. A certain space can make us feel small or big, safe or unsafe. Architecture can put us in a spiritual mood as well.

VII. CASE STUDY

A. TOA PAYOH SENSORY PARK



Figure 14 – Sound device in toa payoh sensory park

1) Fact Box

TABLE I
FACT BOX FOR TOA PAYOH SENSORY PARK

Fact	Information
Location	Singapore
Type	Public Gardens
Architect	Maria Boey
Size	118,403sf
Date	2009
Awards	Silver Award, Professional Design: General Design Category Consultant, UD Landscape Architect, Mr. Yoshisuke Miyake
Users	Public, elderly

2) Summary

The sensory garden and its Universal Design background has seemed to be an engaging recreational site for the nearby Singapore tenants. Client input assembled through the design process, in particularly from the vision debilitated clients, engaged designers to learn best how to enhance the sensory experience in the garden space.

3) Design Features

- Universally Designed (UD) philosophy
- Municipality park
- Easy accessibility
- Passive spaces
- Wide ranging plant palette
- Plant accessibility and interaction
- Sound producing elements

4) Sensory Reach

The sensory garden in situated inside an urban park surrounded by an elderly populace. Sensory components are considered to some degree "prescriptive" and could be more "experimental". Wayfinding components, for example, "orientation curbs" for the blind are used. See Figure 14



Figure 15 – paths in toa payoh sensory park for blind people

5) *Space + Proximity*

Accessibility to the site is a feature of the site. Designers took into substantial thought the surrounding people and potential users. As the urban location of the site, view sheds are limited. Sensory art establishments have been fused into the design to communicate to the users about our five senses. The gardens Universal Design background is evident in the abundant utilization of open elements and components for not only the deaf or blind, but also the elderly and the wheelchair bound users. Spatial variety is made through a progression of five "sensory zones" everyone corresponding stimulating one of the five major senses. Passive spaces are additionally a key element inside the site, giving spaces of rest. Strategically planted sweet-smelling plants are utilized as a wellspring of wayfinding inside the garden design. Sign language panels and braille signage are additionally fused into the design and offer users the ability to interact with the site using their own languages.

6) *Mobility + Proximity*

Seating has been figured at inclusive heights for users to approach site features and components. Sidewalks are not small, but rather could be wider. Linear and curved walkways extend in size from medium to wide yet plantings block few views, while low planters give open views for circulation. See Figure 15



Figure 16 – seatings in toa payoh sensory park

7) *Light and Color*

The site is encompassed by a canopy of trees, so offers abundant light and shadows. The plant palette contains colorful and differentiating colors. The garden and encompassing park gives a variety of plentiful colors and eye catching aesthetic components. See Figure (16) & Figure (17)



Figure 17 – canopy of trees in sensory park



Figure 18 - canopy of trees in sensory park

8) *Acoustics*

The park features one unique element: a sound device consisting of two round concave metal objects, where the user can manipulate sound waves, a truly unique feature. The garden is in a popular urban park setting, so noise could be a factor. Because of the urban setting, streetscape noise and reverberation could be prevalent. See Figure (13)

B. *ELSIE MCCARTHY SENSORY GARDEN*



Figure 19- elsie mccarthy sensory garden

1) *Fact Box*

TABLE 2
FACT BOX OF ELSIE MCCARTHY SENSORY GARDEN

Fact	Information
Location	Glendale, AZ
Type	Public Gardens
Architect	Maria Boey
Size	64.00sf
Date	2002
Users	Public

2) *Summary*

The Elsie McCarthy Sensory Garden was developed to stimulate the senses of sight, sound, smell and touch. Funds were donated for “the purpose of establishing, purchasing, improving, expanding or maintaining a scented and tactile garden for the visually handicapped.”

3) *Design Features*

- Regional plants and trees
- Passive spaces
- Plant selection for texture and scent
- Water and sculpture tactile stimulation
- One of Glendale’s proudest locations
- Use of open spaces
- Cooler climate would be more appropriate

4) *Sensory Reach*

The sensory garden is laid out in an oval shape. The main entry contains a tactile map, but the fact that the bronze map is shaded indicates that during the high temperature of day the space could be unbearable (Figure 19). The artists, Joan Baron and Robert Miley created a sculpture called Seeing Beyond, which is centered as the axis point of the garden. The artwork promotes interaction by way of tactile inspiration and sensory experiences. The sculpture also features water sprinkling through it with tile mosaic tiles. The garden contains textural walkways with smattering aromatic plants. However, the site lacks a significant amount of supporting plants along the walkway to truly engage the user’s senses. Spatial awareness is achieved through a series of four garden rooms and by using different plant materials (grass vs. xeriscaping) and hardscapes vs. softscapes.

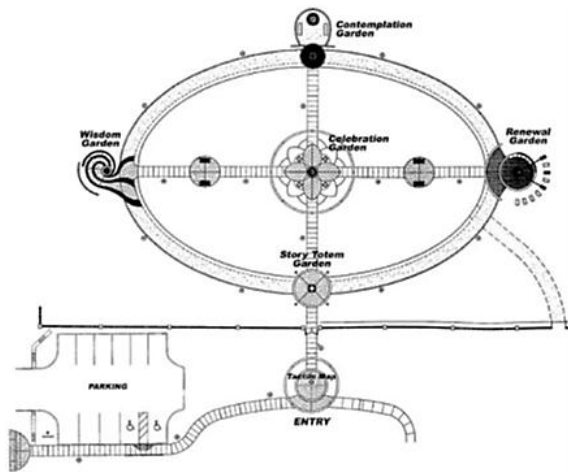


Figure 20 – plan of elsie mccarthy sensory garden

5) *Space + Proximity*

While a sufficient space, the site is exposed to components and its location to be more of an afterthought by the municipality. Summer heat conditions no doubt play a factor in its use and its condition. It's found near the parking area and uncovered views. The garden is still moderately new, so plantings could utilize time to mature. Bigger more developed trees for planting ought to have been considered to give more shade in such a hot environment. Providing some context to the site is the use of local trees and bushes is available at the site too. Access to essential features, for example, the sculpture is

phenomenal, but last of overall elemental features downgrades the site. Complete absence of handrails or broad braille framework for say plant ID makes one consider how the garden is to be legitimately and satisfactorily utilized by the blind. Spatial variety is available inside the site through a series of parceling of the site but not to any real extravagance. Last, there is no seating.

6) *Mobility + Proximity*

The location of the garden, inside an exposed park, offers completely open scene of encompassing soccer fields. While the walkways are of wide berth changing of materials from dirt to asphalt could be dangerous for the blind if moves are worse depicted on the dirt surfaces. Because of its oval shape, the site comprises of both linear and curved pathways, which are advantageous to the deaf and the blind. See Figure 17&Figure 18 &Figure 20



Figure 21 – linear pathways



Figure 22 - curved pathways

7) *Light and Color*

There is sufficient natural lighting on the site and a requirement for more shade. Over exposure to the sun and making light of the sun's glare would be advantageous to the site and clients. The focal sculpture offers a variety of color mosaics that offer some material assortment to the garden. The plant palette offers a constrained assortment of colorful plants. Differentiation in the site is best found in

hardscape versus softscapes and the different uses of the limited plants.

8) *Acoustics*

Because of the location of the garden within a local park and localized traffic, positive sensory incitement could be raised doubt about. The one saving grace acoustically would be the model and its accompanying wayfinding water feature. Gravel as a paving material offers one of the few other acoustic properties. The sensory garden lacks overall acoustic cues which could be essential for blind users.

C. *Final Findings and Observations*

From these two case reviews, seven important design guidelines have been hashed out:

- 1- Collection of user input from people , and designers for the design
- 2- Exploitation of various innovative sensory stimulating elements
- 3- The need for access and interaction to the site, to site elements, and to a wide-ranging palette of plants makes for a strong design
- 4- An imaginative design layout that promotes linear and curvature circulation patterns
- 5- Incorporation of linear pathways and curved seating
- 6- The ample usage of light and shade to define spaces
- 7- A wayfinding system that utilizes a creative plant palette, resourceful water features, textured elements



VIII. CONCLUSION

After exploring the relation between people and the architectural spaces they inhabit, senses were found to be the main tools for connecting people with the surrounding environment but at the same time not the only tool as people are influenced by their mind and emotions as well. Finally, a brief summary of how to obtain harmony between people and their surrounding in an architectural space, and designing with a user centered approach was put in the form of a chart (Fig.21). This chart should be considered before the working drawings and design choices are taken. The chart basically shows two main issues to think about when designing with a user centered approach; senses and emotions. And from the consideration of user’s senses and emotions in design, six guide lines were obtained.

Concerning the senses there were three main issues to be

put in consideration. First of all, the fact that the first impression about people’s surrounding most of the time relies on vision, and the fact that if architects relied only on visual aspects in design people would feel detached and isolated from their surroundings, just connecting with the world only through their eyes when people’s language with their surrounding environment consists of all the senses. The second issue was the fact that the amount of stimulant added should be studied according to people’s needs and that just increasing the amount of stimulants doesn’t necessarily affect people positively. The last consideration for the senses is that the most persistent memory of a place is its smell. The three considerations for people’s emotions are the facts that emotions affect impressions about people’s surroundings, and people emotions are affected by people’s concerns and other than functional concerns of space, the main emotional concerns for people in architecture are: the need for stimulation, the need for security, and the need for identity.

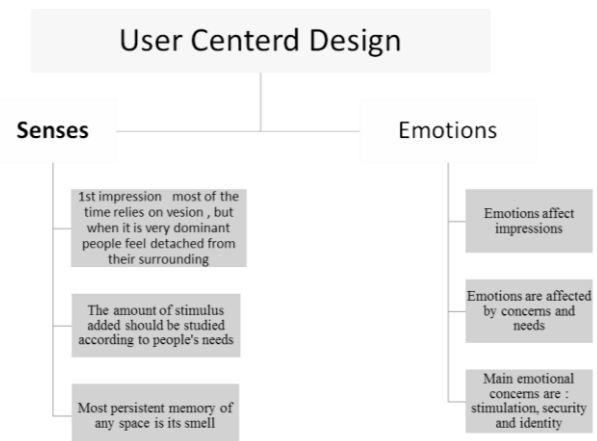


Figure 23 – Guide Lines to Obtain Harmony between People and their Surrounding in an Architectural Space

REFERENCES

- [1] (n.d.). Retrieved from archdaily: <http://www.archdaily.com/61288/ad-classics-salk-institute-louis-kahn>
- [2] Brebner, J. (1982). Environmental psychology in building design. Applied Science.
- [3] Christianson, S.-A. (2014). The handbook of emotion and memory: Research and theory. Psychology Press.
- [4] Dodd, J. (2017). Phenomenology, Architecture and the Built World: Exercises in Philosophical Anthropology. Brill.
- [5] Eye of Horus / Eye of Wadjet. (n.d.). Retrieved from sites.google.com: <https://sites.google.com/site/thegoldenpathofillumination/eye-of-horus>
- [6] Gifford, R. (2007). Environmental psychology: Principles and practice. Optimal books Colville, WA.
- [7] Heywood, I. a. (2017). Sensory Arts and Design. Bloomsbury Publishing.
- [8] Jakle, J. A. (1976). Human spatial behavior: a social geography. Duxbury Press.
- [9] Jay, M. (1994). Downcast eyes: The denigration of vision in twentieth-century French thought. Univ of California Press.
- [10] John P. Eberhard, F. a. (April, 2004). Architecture with the brain in mind. The Dana Foundation.
- [11] McAndrew, F. T. (1993). Environmental psychology. Thomson Brooks/Cole.

- [12] Mehrabian, A. (1976). Public places and private spaces: the psychology of work, play, and living environments. Basic Books New York.
- [13] Norberg-Schulz, C. (1980). Genius loci: Towards a phenomenology of architecture. Rizzoli.
- [14] Pallasmaa, J. (2000). Hapticity and time. *Architectural Review*, 207.
- [15] Pallasmaa, J. (2012). The eyes of the skin: architecture and the senses. John Wiley & Sons.
- [16] Seamon, D. (2000). Phenomenology, place, environment, and architecture: A review of the literature. *Phenomenology Online*, 36.
- [17] Smith, D. W. (2008). Phenomenology. *Encyclopedia of Cognitive Science*.
- [18] University of Kansas, S. o. (n.d.). <https://cte.ku.edu>. Retrieved 6 15, 2017, from <https://cte.ku.edu/sites/cte.drupal.ku.edu/files/docs/portfolios/kraus/essay2.pdf>
- [19] Varming, M. (1970). Motorveje i landskabet. *Motorway in the Landscape*.
- [20] Wiles, D. (2003). *A short history of Western performance space*. Cambridge University Press.