DESIGNING mindscapes

Manpreet Juneja | December 2016

Designing Mindscapes

Re-inventing Urban Spaces by understanding Psychology of Design and Philosophy of Heterotopia

By Manpreet Juneja

MDes, December 2016

A major research project submitted to Ontario College of Art and Design University in partial fulfillment of the requirements for the degree of Master of Design in Strategic Foresight and Innovation
Toronto, Ontario, Canada

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Abstract

Urban spaces are becoming monotonous in their appearance as well as in terms of their experience. In an effort to match the fast pace of our lifestyles, the design of most of our streetscapes and urban areas in our cities have started to look and feel the same. The thesis of this major research project is an investigation into the understanding of the psychological impact of the design of such spaces on human beings, and an attempt to develop a framework to summarize this understanding to help designers and architects design our environments to inspire creativity and innovation. The framework derives its inspiration from the philosophy of 'heterotopia' proposed by Michel Foucault, where heterotopia is referred as "the other space", a space which facilitates heterogeneous experiences.

Acknowledgements

This study received a great deal of support from people whom I was humbled and privileged to have throughout. It certainly is not complete without an expression of gratitude to those who have helped shape this effort into a successful project. Therefore, I would like to utilize this opportunity to extend our heartfelt gratitude to them. I am deeply touched by the support and guidance received from my friend Nihal Ahmed who introduced me to this course at first place.

I express gratitude towards my primary supervisor Professor Jeremy Bowes, for the relentless support and academic guidance that encouraged my project towards the path of excellence. Sincere thanks to Lenore Richards, Program Director of the MDes in Strategic Foresight and Innovation Program, for giving us an opportunity to expand our knowledge and assisting our effort to work on independent projects. Heartfelt thanks to Nabil Harfoush and Patricio Davila, being members of my advisory committee, their advice and feedback was very crucial to help me finish my project. Special thanks to Jason Silva, the host of National Geographic's Brain Games and producer of You-tube series Shots of Awe to introduce me to Heterotopia and related topics. Finally, my deepest appreciation to my family, friends and classmates for their constant encouragement and inspiration to always deliver my best all throughout.

Thank You

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Fig. 1: Songwriter and Singer: Bob Dylan

Image source: Paul Townsend, http://bit.ly/2i1aS2G

"For me, the environment to write the song is extremely important. The environment has to bring something out in me that wants to be brought out. It's a contemplative, reflective thing…Environment is very important. People need peaceful, invigorating environments. Stimulating environments."

-Bob Dylan

Overview

Background

Anne Marie Willis, in a paper on Ontological design exclaims “we design our world, while our world acts back on us and designs us”. She explains ontological design as a way of characterizing the relations between human beings and life-worlds. Designing she says is fundamental to being human — we design, that is to say, we deliberate, plan and scheme in ways which prefigure our actions and makings — in turn we are designed by our designing and by that which we have designed (i.e., through our interactions with the structural and material specificities of our environments) (Willis, 2016).

With the unruly, and erratic demands of urbanization, our cities have to expand to accommodate more and more people moving from rural areas to urban centers. The time for designs is often compromised in response to the rate at which the cities are expanding, resulting in lengths of cityscapes that look all the same from one city to another, as if designed to match the speed of moving cars disregarding the details that pedestrians experience along their way from home to work.

Fig 2: Left: 666 Fifth Avenue building, New York; Right: Simcoe Street, Toronto, (Image Source: Google street view)

This is in-turn affects the lives of those living in these spaces, who are spending time in these uninspiring and seemingly mundane environments. A growing body of research in cognitive science illuminates the physical and mental toll that bland cityscapes exact on residents. Generally, these researchers argue that humans are healthier when they live among variety or work in well-designed, unique spaces, rather than unattractive, generic ones. There might even be a potential link between mind-numbing places and attention deficit hyperactivity disorders. In one case, physicians have linked “environmental deprivation” to ADHD in children (Urist, J., 2016).

Concept

In his essay on “Of Other Spaces”(Foucault, M., 1984) Foucault describes “heterotopias” as “counter sites with a kind of effectively enacted utopia in which all the ‘real sites’ that can be found within culture, are simultaneously represented, contested, and inverted.” Heterotopic space often proposes alternate ways of thinking and social ordering, offers the opportunity for the realization of alternate thought, and as Foucault states “simultaneously represent, contest and invert” the dominant and rigid ideas of ideal spaces (Yama, 2012). With further reading of his theory, one can interpret that these heterotopias form counter-spaces by creating illusions, which infiltrate reality, allowing life to exist in its purest form, expressing itself fearlessly without inhibition. According to Foucault these spaces are in fact more real than most real places. Modern examples of heteroto-

pia can include events like The Burning Man, the Summit series, theatre performances, museum installations, gardens, libraries, gated communities, etc.; places that allows the free-exchange of thoughts, ideas, passions and curiosities. These spaces are a designed juxtaposition of built and unbuilt forms, of culture and art, ideas from the history and the conception of future, represented simultaneously in one space to inspire creativity and innovation.

Approach

My Major Research Project (MRP) is an interdisciplinary study to understand the relationship between the design of built-environments and associated human emotions in detail, and further investigate the Philosophy of Heterotopia to apply it's principles in curating positive experiences. This interdisciplinary approach has helped me to theorize a framework which can help designers and architects to take advantage of the knowledge from the related fields and apply them in re-creating existing urban fabric, so as to stage a positive experience of Heterotopia. To understand the elements of this framework, I studied the role of art, architecture, culture, media and technology in orchestrating urban experiences, to not only fosters creativity and fresh thinking but also to inspire life in urban environments. My approach to this project is inspired by the Constructivist paradigm of learning. By building upon the understanding of experts and fellow researchers in related fields, I have analyzed various examples to illustrate their findings and reflected upon my own experiences to arrive at the final framework.

Methodology

My research followed a **Human centered design process** by keeping human experience at the centre, and then applying **Systems thinking** to understand it's relationship with the entire system to theorize the final framework. The proposed framework is essentially an end product of a literature review capturing the details and findings from the related fields of philosophy, cognitive architecture, psychogeography, and ontological design, in relation to the architecture of built spaces; followed by expert interviews to expand my knowledge and synthesize the findings into a consolidated framework. I also supported my study with a survey to examine the validity of the proposed framework.

Following is the summary of my research methodology:

Literature Review

- Subjects related to Psychology of Design
- Philosophy of Heterotopia
- Media Architecture and Technology

Expert Interviews

Experts working in the field of Art, Design and Architecture

- Michael Page (Faculty at OCADU)
- Scott Mcquire (Faculty at University of Melbourne)

- Architect and Artist Philip Beesley
- Rafael Lozano-Hemmer (Artist, Media Architecture)
- Jean Francois Secard (CPO, Vrvana)
- Tanya Toft (Faculty at University of Copenhagen)
- Kevin Mastin (Former US Army Air force Pilot and

  Director of Business Development, AOA Themed Entertainment)
- Facebook Live chat with Jason Silva (Host of Brain Games)
- Email conversations with Collin Ellard

  (Author, Psychogeography of Everyday life)

Survey

Sample size 25 people of age group above 18, no gender preference

Introduction

With increasing urbanization, it is estimated that by 2050, 66% of the world's population will live in urban-environments, (World Urbanization Prospects, 2014)—the idea of people-friendly and human centred design matters more than ever with the movement of people to artificially-built-environments. An article published in the New York Times recently discussed the psychological cost of boring buildings on our economy. It claimed that boring buildings designed only to serve the means to accommodate people with no attention or emphasis on its design can take an emotional toll on the people forced to inhabit them, thereby affecting their health and productivity at work (Urist, J., 2016).

"Our thoughts shape our spaces, and our spaces return the favour", writes Steven Johnson in his book, Where Do Good Ideas Come From (Johnson, S., 2016). This implies that our creativity and capacity to think and innovate is related to the quality of spaces in which we are surrounded. There seems to be an active engagement between our mind and the world, a feedback loop between the spaces and our cognition. This puts the onus on the designers of these spaces to ensure that they respond to these feedback loops, and to design spaces with an awareness of their effects on it's users. Most of our urban areas are dense and constrained by existing infrastructure. Most cities cannot afford to demolish existing infrastructures, which limits us from envisioning newly built spaces but this shouldn't stop us from thinking of ways and means to enhance the quality of lives and experiences that people have in existing built environments.

Given this context, I studied the psychology of designed spaces to understand the effects of environments on human beings, further taking inspiration from Michel Foucault's philosophy of heterotopia, I developed a framework which can help in understanding the nature of existing or proposed built environments. This framework, I believe can help designers and architects to understand the effect of their proposed or existing designs on human behaviour. This understanding can help them to design better; so as to foster positive experiences and creative thinking for enhanced quality of life in existing urban fabric. To develop a framework of such a nature which brings together an understanding from various related areas of study, I had to undertake an interdisciplinary investigation to draw parallels and build upon the overlaps from the related fields. This approach helped me synthesize the findings from each of these fields and summarize the contents into a framework which can then be useful for designers and architects.

Following are the related subject matter covered through literature review to inform the final framework:

Related Subject Matter

Systemic Ecologies and Urban Design

When we talk of cities, we are generally referring to a built-environment that serves as a habitat for city dwellers which offer facilities to live and work including educational buildings, hospitals, residential apartments, offices, museums, entertainment centres, religious buildings, public transport, and parks, etc. The idea that nothing exists in isolation−but only as part of a system−has long been embedded in folklore, religious scriptures, and common sense (Orr, D., 2014). Even cities are no exception to the rule. However, despite a great deal of talk about systems, we continue to administer, organize, analyze, manage, and govern complex ecological systems as if they were a collection of isolated parts and not an integrated union of energy, water, soils, land, forests, biota, and air. Jane Jacobs once wrote: "Cities happen to be problems in organized complexity . . . present(ing) 'situations in which a half-dozen or even several dozen quantities are all varying simultaneously and in subtly interconnected ways.' The challenge, then, is to transition organized urban complexity built on an industrial model and designed for automobiles, sprawl, and economic growth into coherent, civil, and durable places (Orr, D.,2014). To be able to find opportunities to enhance living conditions in existing cities, we need to understand the relationship between humans and the surrounding spaces and the interaction between the two. This human-centric approach is necessary to develop any framework that can help to enhance the quality of experience and life in cities for people.

Human-Centred Design

Insightful urban design can enhance social interaction, create more user-friendly public space, and respond to evolving urban conditions. A human-centred approach - a process that uses applied ethnography to uncover human needs and strengthen relationships between users and a place or product to design, can help Urban Designers capture the meaning behind basic behaviors to identify needs and understand how and why people use spaces (Smith, M. V., 2015).

For a deeper understanding of spaces and their effects on human beings, I believe it is important to study various human-centred approaches within urban design and related fields. My approach will be to cover the subject matters which delve at the intersection of urban design and human psychology.

Psycho-geography

Psychogeography is an approach to geography that emphasizes playfulness and "drifting" around urban environments. "It is a study of the precise laws and specific effects of the geographical environment, consciously organized or not, on the emotions and behavior of individuals" Guy Debord (Debord, G., 1955).

Psycho-geography is therefore study of the interaction between users of the space with their environments. Understanding this relationship interaction can help in designing better spaces that have positive interactions. If one understands how spaces can affect and inform human behaviours, we can design places to ensure fruitful and positive behaviours. Through my research and the synthesis of my understanding of this relationship, I will identify some elements of spatial design that can help foster positive experiences.

Ontological Design

Ontological design is a conceptual approach that has its roots in computer science and focuses on the design of a way of being - not just using the mind as a tool to process information, but to enhance its productivity by creating tools and systems to facilitate and expand human cognition. We create tools to assist us in our day-to-day activities. These tools serve as extensions to our minds and bodies, extending our capacities to perform tasks. Ultimately these tools also define the way we operate and perceive the world around us, by dictating their use to perform our daily activities. In other words, the tools we design, define our way of living, so as to say they design us back. The same is true with every object or space designed by us. A carefully designed space can therefore be responsible in some-ways to either have a useful or harmful impact on our way of life.

Cognitive Architecture

Cognitive architecture is an approach in architecture that focuses on understanding the response of human beings to their built environment. Buildings are intended to be viewed, traversed, and lived in by people, but only a handful of theoreticians and practitioners of architecture often think deeply about human nature and, why and how it needs to be considered seriously when designing buildings and urban area. Sussman and Hollander in their book on Cognitive Architecture, describe the reasons behind our attraction to edges, faces, symmetry, curves, and stories. All of which have deep evolutionary roots, and therefore should influence architecture and urban design (Sussman, A., et.al, 2015).

Studying human responses to the shapes and features of architecture is essential to propose good spatial configurations that in turn instigate positive emotions.

Urban Sociology

Urban sociology is the sociological study of life and human interaction in metropolitan areas. It is a normative discipline of sociology seeking to study the structures, processes, changes and problems of an urban area and by doing so, to provide inputs for planning and policy making. It as the sociological study of cities and their role in the development of society (Random House Dictionary, 2016).

The context always plays an important role in any experience. The background, the history, the narratives of accepted ideals and norms plays essential roles in curating experiences. Therefore as the object under consideration is our cities we have to ensure that we do understand the current context to respond with an understanding of what is relevant and effective in the current context. The burning problems of today can inform our direction for the future, if we pay attention to our crisis today and respond to it with a responsible attitude, we can help eradicate or neutralize the possible harmful effects of our mistakes. Hence in this research I try to outline and paint a picture of current context, then relate my proposals as a response to address the present situation.

Philosophy of Heterotopia

A talk given to a group of architects by Michael Foucault in 1979 is the most well-known explanation of the term “Heterotopia”. He attempts to describe certain relational principles and features of a range of cultural, institutional and discursive spaces that are somehow ‘different’: disturbing, intense, incompatible, contradictory yet transforming. In a nutshell, heterotopias are worlds within worlds, mirroring and yet upsetting what is outside. Foucault provides examples: ships, cemeteries, brothels, prisons, gardens of antiquity, fairs, Turkish baths and many more (Johnson, P., n.d.). In my research I will elaborate the basic idea behind each of these examples and try to draw parallels to propose it’s application in a current context.

Since the time when Michel Foucault first presented the theory, the concept of Heterotopia has seen its wide application in a number of fields related to real and virtual spaces. It has also seen a wide range of interpretations, inspired from his writings and a sketch he developed to illustrate his idea of “Heterotopia”. He proposed Six principles which can be used to understand a space as a heterotopic space. A study of this concept and its application in today’s context can help us redefine our urban spaces and recreate them to enable innovation and creativity.

Research questions

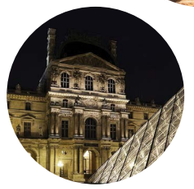
How might we apply the Psychology of Design in re-inventing urban spaces to foster creativity and innovation?

- How can philosophy of Heterotopia help us design spaces that trigger positive emotions and inspire creativity and innovation in urban environments?
- How might we apply the principles of heterotopia in a modern context? Can we re-create Heterotopic experiences in the existing urban fabric of our cities with the help of emerging technology?

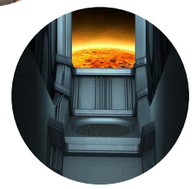
Structure of Research

1
Urban Sociology
Understanding the Context

2
Types of spaces
(Architecture)



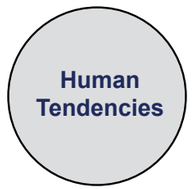
Physical



Virtual

3
Psychology of Design
How do physical
spaces affect behaviors?

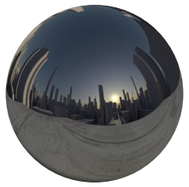
Emotional
Responses



Why do we do
what we do?

4
Superimposing
Narratives
(Theatre/Arts)

5
Philosophy of
Heterotopia
Principles of Heterotopia



6
Framework
What makes a space a Heterotopia
(Systems Thinking, Human Centred Design)

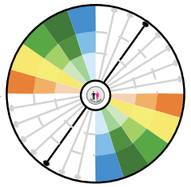


Fig. 3: Structure of Research (Images used in the illustration from www.pixabay.com)

Part 1
Urban Sociology

Urban Sociology

Urban sociology is the study of social life and interactions in urban areas, using methods ranging from statistical analysis to ethnography. The father of urban sociology, George Simmel describes urban sociology as an account for the interrelation of subcultures in an urban area, as well as the internal structures of segments of society. According to him, like biological systems, urban subgroups are dependent on one another for healthy functioning and are also dynamic- that is, they flourish and decline based on political, economic, and social tides.

Advances in transportation and telecommunication infrastructure are promoting rapid globalization across the world, resulting in international integration, interchange of the world views, the import-export of products, exchange of ideas and other aspects of culture. This phenomenon is a major reason behind the changing demographics of our cities. We live in very multi-cultural times, where our neighbors are strangers to us, more than ever before in the history. Cities are melting pots of cultures and various ethnicities; the intermingling of various cultures and backgrounds is resulting in new types of social constructs which are not stable but rapidly evolving with the to and fro movement of people.

Rapidly evolving 'social constructs' due to globalization:

The term social construct is defined by the Oxford Dictionaries as "a concept or perception of something based on the collective views developed and maintained within a society or social group." Social constructs have been changing throughout the human development process, however, the pace of evolution of social constructs in today's world is radical and unlike the one before (generations before). It is sporadic and unpredictable, resulting in an increased pace of reorganization and disruption in communities which is hard to grasp and keep up with, which makes it an underlying meta-problem of civic engagement in communities. Some of the contributing factors leading to this exponential evolution include developing technology, digital media, urbanization, and globalization. Social Constructs play an important role in individual's understanding and learning as well as community's knowledge and wisdom. Fritjof Capra in his book The Hidden Connections (Capra, F.,2002) talks about the tacit and explicit knowledge in communities. He defines tacit knowledge as "the context of meaning" that is created by the dynamics of culture resulting from a network of communications within a community. Learning in communities, therefore, is a social phenomenon, "because the tacit knowledge on which all explicit knowledge is based is generated collectively. Moreover, cognitive scientists have come to realize that even the creation of explicit knowledge has a social dimension because of the intrinsically social nature of reflective consciousness. Hence, the systemic understanding of life and cognition shows clearly that collective learning in our societies has both individual and social aspects" (Capra, F.,2002).

Tony Fry in his book Becoming Human By Design (Fry, T., 2012) shares a very provocative narrative on human evolution. He says: "For almost 150,000 years we were nomads, for the past 10,000 years we have been settled, the moment unfolding is that of un-settlement" This means we are now in an age of unsettlement where people are moving across the globe for work, traveling to new places because of access to travel with our increasing capacity to afford travel. Therefore we can't anymore live in our own bubbles, we will be constantly exposed to new situations, either when we

decide to travel or people from other parts of the world travel to our neighborhoods.

Fig. 4: Systemic Drivers: Population growth, Urbanization, Globalization (From left to right) (Image Source: pixabay.com)

Population Growth, Globalization and Urbanization can be seen as major systemic drivers forcing a lot of changes in demographics to urban areas and therefore influencing the way we are addressing and responding to many of our problems of housing and urban design. Other systemic drivers which further influence our urban and residential designs include city planning rules and regulations to accommodate basic safety and housing norms so as to accommodate the increasing growth in urban populations, but these often disregard human tendencies which are important to consider while designing urban spaces to ensure collective growth and progress of human societies.

In a formal conversation with Assistant Professor Scott Mcquire from University of Melbourne, also a renowned author of the book, 'The Media City', he made an interesting argument about our current problems of complex social environments. He argued:

> *"Our problem today is to understand and comprehend, how might we live in cities of strangers, who don't share cultural backgrounds like us, don't speak the same language or practice same rituals? Our contemporary cities are witnessing complex societies, conflicting interests where we do not completely feel good about each other. Responding to others on their own terms requires social skills, practical skills through encounters experience necessary to survive in complex lives.* ***This can be achieved only by allowing and staging social encounters by designing public spaces which allow for social interactions, where people can share common experience and find common grounds to connect and bond****."*

According to him, public spaces need to promote a duality of exchange, one that helps people build social skills through engagements, and on other hand by allowing people to behave the way they do. This creates new social behaviors will take shape defining new social norms, which is essential for our collective growth and development.

Social skills help people to engage in public spaces → Public space Duality ← How we interact in public spaces create new social norms

Scott Mcquire shared an interesting understanding of Architecture as an **"event space",** where social interactions can be organized and hosted. He says these interactions also are changing with

the introduction of new media and technology. Social interactions according to him are changing their form and organization through digital infrastructures. Media architecture is changing our encounters. Media events in this day and age can be captured and broadcasted across time and space which is making our interactions unique. Real time feedback possible with the availability of internet on mobile phones is increasing the possibilities of synchronistic experiences. These new forms of interactions with low transaction costs have made possible trans-national communications and increased the outreach of public communication. As much as this is positive, new media and technology integration also needs to be embraced with caution, as the issue of surveillance and privacy are threatening the freedom of speech and individual rights to privacy.

Understanding the changing forms of interactions and the need for public gathering and events is important to the design of our public spaces to accommodate the changing need of our society. Predictions and forecasts only indicate a more complex nature of societies in future with more than 60% of populations moving to urban spaces by 2050. Hence it is important for designers of public spaces to consider the changing demographics to develop new methods and means to allow for positive and fruitful social interactions. This is not only important to ensure positive mental-health and safety in our neighborhoods but also to create and maintain a productive environment for growth and development.

Our experience is a collaboration between our 'environment' that dictates experiences, and our 'minds' that engages in experiencing. "We cannot design experience, but we can design experiencing" Liz Sanders suggested at a recent conference 'RSD5' organised at OCAD University, Toronto. That means we can design the environment to 'stage and allow for an experience' in other words 'experiencing'. David Lenson, A University of Massachusetts professor of literature in his book "On Drugs" says "Consciousness is a collaborative process, it is a collaboration between the subject and the object". In other words, we are a summation of our 'physical self' being the subject, interacting with the 'environment' which is the object. This interaction between the **subject** and the **object** results in our ***experience***. To understand this relationship better, refer to the illustration I have created (Fig. 4). The understanding of each of these elements in detail can assist us in comprehending this relationship better. The interaction between subject and object occurs in an event space. The thing that differentiates the event space from object or environment is that an object can be fixed in it's design and constrained by its physical limits but the event space can be re-created or say super-imposed to inform an experience.

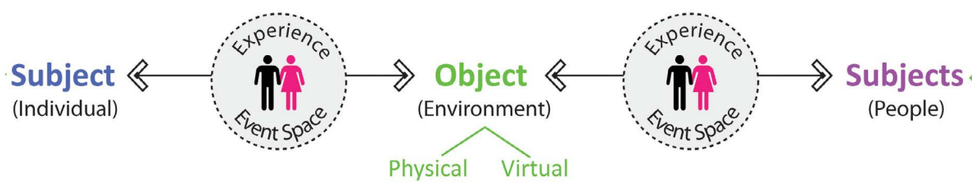
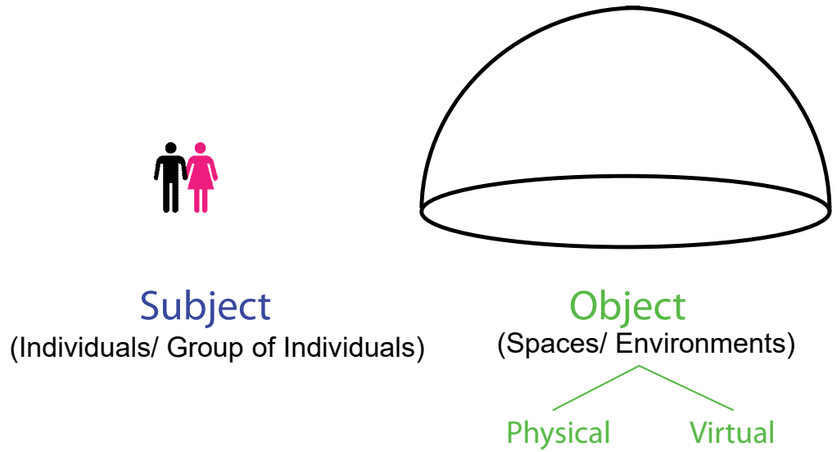


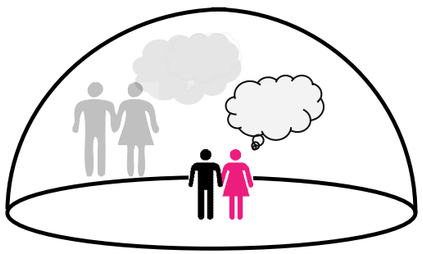
Fig. 5: Diagram generated to illustrate the Subject-Object Relationship (Author's work)

One can notice that this idea of subject-object relationship completely resonates with the concept of 'interdependence' and the 'cause and effect' relationship which takes it's root in Systems thinking. Understanding the cause and it's relationship with it's effects is therefore crucial to (control) manage or understand the behaviour of the system. Hence, it is useful to observe and study our feelings & experiences crafted through our interactions with the environment.

To further clarify my understanding about our experiences in any given environment, I began to search for basic definition of the word 'experience'. Oxford dictionary defines experience as an 'encounter' or an 'event' or 'occurrence'.

So what do we encounter in a space/ environment?





Space + Stories (Narratives)

Experience = Space + Story (Narratives)

Fig. 6: Diagram generated to visually represent experience (Author's work).
This diagram is the essence of my research. My research is structured around this equation, where I explain each of these 3 elements of the equation in further detail.

Therefore Experience is a summation of the spatial design and the stories we hear about the space. Never before in history are we better equipped with the necessary technology to study this intricate relationship. This venture is doubly pressing because the same kinds of technologies that we can use to study the human response to environments are also being deployed increasingly in our

environments to leverage the traditional tools of design that influence our feelings, wants, needs, and decision making biases. These technologies are redefining everything from our public places to the meaning of a wall and revolutionizing the ways in which our surroundings can affect us (Ellard, C., 2015). With close attention and speculation one can notice the impact of design, and design technologies on the development of our culture and emotional experiences.

System Boundary:

My focus of this research has been to carefully study the nature of our urban spaces and analyze it's possible effects on human emotions based on the findings from the field of neuroscience and psychology and further tying it up with philosophy of human growth and development. All the work cited in the research is backed up by a thorough research, although there may be instances based on the culture and the context where some of the findings may not directly apply. There may be other elements of design, programming or history of the space in consideration which may enhance or surpress the effects on human emotions.

The focus of the research is to study the effect of physical spaces and virtual spaces (that resemble physical spaces in terms of its dimensionality) on human emotions, although it must be noted that design and architecture of a space is not solely responsible to trigger emotional responses in human beings, they may add to the effect or influence the behavioural and emotional responses. In some cases the emotional responses may be related to factors other than spatial configutations. These contributing factors may include mental health of the user, history, background, context, time, weather, location, etc. and therefore the resulting emotional response may not comply with generalized understanding of emotions proposed in this research.

Part 2

Experience = **Space** + Story (Narratives)

Understanding Physical and Virtual Environments/ Spaces

In his book Francis D.K. Ching discusses basic elements, systems, and orders that constitute a physical space. All of the constituents of a spatial design can be perceived and experienced. Some may be readily apparent while others are more obscure to our intellect and senses, some may dominate while others play a secondary role in a spatial design organization. He suggests that some spatial design can also convey images and meanings while others merely serve as qualifiers or modifiers of these messages. In all cases, however, these elements and systems should be interrelated to form an integrated whole having a unifying or coherent design (Ching F., 1943).

“Architectural order is created when the organization of parts makes visible their relationships to each other and the structure as a whole. When these relationships are perceived as mutually reinforcing and contributing to the singular nature of the whole, then a conceptual order exists—an order that may well be more enduring than transient perceptual visions.” Francis Ching

For the purpose of my research I have referred to his framework to unpack the design elements of any given physical environment, one can use this framework to understand any spatial arrangement, physical or virtual. In my understanding, I see virtual spaces that resemble physical environments as technologically mediated spaces with virtual scaffoldings instead of physical, therefore we can associate some of these common terminologies of physical environments for technologically mediated spaces, that are ‘Virtual’ or ‘Cyber’ spaces.

Physical Environments/Spaces:

Francis Ching argues that architecture of the physical environment is generally conceived, designed, realized, and built, in response to an existing set of conditions. These conditions may be either functional in nature, or they may also represent the social, political, and economic climate to a varying extent. Either ways, the prevailing set of constraints and conditions define: the problem, which is less than satisfactory and a new set of conditions then can be referred to as: a solution, which is desirable. The act of creating architecture, then, is a problem-solving or design process.

“The initial phase of any design process is the recognition of a problematic condition and the decision to find a solution to it. Design is above all a willful act, a purposeful endeavor. A designer must first document the existing conditions of a problem, define its context, and collect relevant data to be assimilated and analyzed. This is the critical phase of the design process since the nature of a solution is inexorably related to how a problem is perceived, defined, and articulated. Piet Hein, the noted Danish poet and scientist, puts it this way: ‘Art is solving problems that cannot be formulated before they have been solved. The shaping of the question is part of the answer.’ Designers inevitably and instinctively prefigure solutions to the problems they are confronted with, but the depth and range of their design vocabulary influence both their perception of a question and the shaping of its answer. If one’s understanding of a design language is limited, then the range of possible solutions to a problem will also be limited.” Francis Ching

In his book “Form, Space and Order”, Ching helps designers to expand their understanding of the space by sharing with them a rich vocabulary of design through the study of its crucial elements and principles and the exploration of a wide array of solutions to architectural problems developed over the course of human history.

As an art, architectural design satisfies more than the functional requirements of a building program. Basically, the physical realization of architecture is to accommodate human activity. However, the arrangement and ordering of forms and spaces also guide the, elicite responses, and convey meaning. “So while this study focuses on formal and spatial ideas, it is not intended to diminish the importance of the social, political, or economic aspects of architecture. Form and space are presented not as ends in themselves but as means to solve a problem in response to conditions of function, purpose, and context—that is, architecturally.” Francis Ching

Francis Ching further explains that just like one must learn the alphabet before spelling words to develop a vocabulary, one can train themselves to identify the fundamental elements of form and space so as to understand how they can be manipulated and organized in the development of a design concept, before addressing the more vital issue of meaning in architecture. The understanding of real spaces is a first step to re-invent it into a heterotopic space where the boundaries between the real and the imaginary begin to blur.

‘Programming’ is another aspect of architectural design that architects and designers can use to reprogram and re-purpose any space, so as to enhance experience. Rafael Lozano Hemmer, media artist works with interesting elements of the physical and virtual realm to re-create new experiences in seemingly ordinary urban spaces. In 2005, he programmed a project named “Under Scan” in Lincoln, United Kingdom, where he created an interactive video art installation at Brayford University Campus, where the passersby were detected by a computerized tracking system, which activated video-portraits projected within their shadow. The installation was programmed to run for about 9 days from the 25th of November till the 4th of December 2005. “In the installation, the portraits appear at random locations. They “wake-up” and establish eye contact with a viewer as soon as his or her shadow “reveals” them. As the viewer walks away, the portrait reacts by looking away, and eventually disappears if no one activates it”, Rafael Lozano Hemmer. Programming of spaces in interesting and creative ways can really enhance user experience and inspire interesting interactions in public spaces.

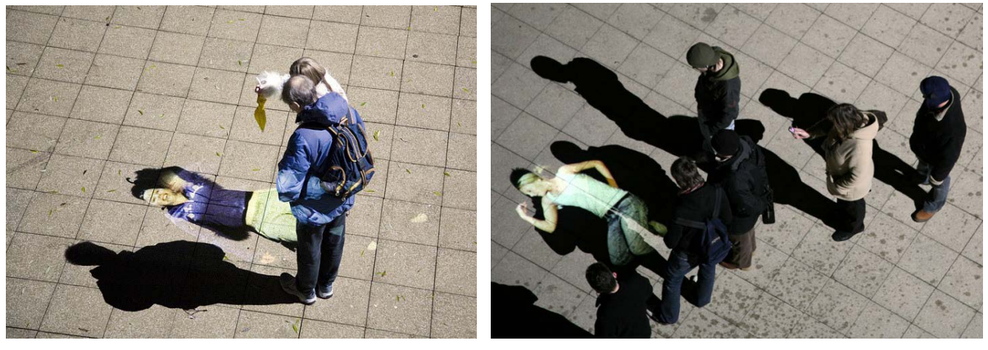


Fig. 7: “Under Scan” recreational architecture project by Rafael Lozano Hemmer in Brayford University Campus, Lincoln, United Kingdom, 2005 (Image Source: http://www.lozano-hemmer.com/under_scan.php)

Technology enabled Virtual Environments/Spaces

"Technology is our own creation, to aid us in our exploration to search for meaning in life." Marshall McLuhan aptly explains technology as an extension of the human body. Relying on our phones to keep us up to date, reminding us of the past through pictures on social media, keeping us disciplined while remembering for us our appointments, helping us to plan ahead through advanced weather forecasts, one can say we are on our way to offload our cognitions to technology. We are already dependent on the integrated and essential feedback arrangement we have ourselves created (running non-stop from our phones to our brain) with our technology. Our virtual computer generated environments are slowly entering our physical landscape through media architecture, projections, etc., or we can also say we are entering virtual spaces, this give and take between the physical and the virtual environments is blurring the boundaries between the two. Although our physical environments have always had a layer of virtual elements in the form of printed media and paintings and art forms, the term "virtual environment" was coined with the advent of computers, when we started generating virtual environments, where we differentiated virtual from what was real.

The experience of initial versions of virtual environments was very limited, they acted like display screens with no perspectives built into them although they did allow for some form of interaction. Slowly as the technology progressed, more details in terms of color, depth, gradation of light and dark, perspectives started to emerge. The experience of these spaces was still not as immersive, they acted as an interface between the physical and the real. We were able to distinguish the difference between the spaces behind the computer screen from that outside it as we could experience our self physically anchored in the space around us while gazing at a screen which had another representation of two-dimensional space inside it. Then with the advent of three dimensional design softwares, such as autocad for basic drawings, google sketchup for concepts, 3d Max and Rhino for high definition renderings of real spaces, etc. it further advanced the newly emerging typology of spaces which could now be rendered to seem hyper real, with detailed three dimensions within the virtual medium. The technology of virtual reality revolutionized the interaction with these virtual spaces. It made it possible for us to enter these virtual worlds merely by wearing a headset which literally beamed these high definition spaces straight onto our eyes, tricking our brain to accept the virtual environments as real, in turn, immersing us in its context. When everything that engulfed the vision, or the line of sight was a space of some sorts, with increase in its quality of detailing, it almost ceased to affect one's experience in a space, whether the context of space was real or projection of something that simply felt real.

With time our virtual environments are only getting higher and richer in their resolution and details. They are becoming close to real, and soon they may literally extend our physical environments into virtual. The day may come when we will (render) experience the infinite space beyond our planet through our virtual aids and technology. Virtual tourism (is no more a thing from the future) it is becoming a reality. Recently I volunteered to help at a Virtual reality conference called Immersed 2016 held at Ontario Science Centre, Toronto. I witnessed some of the cutting edge virtual and digital environments, created virtually and using augmented reality headsets blended and integrated real spaces. The computer generated environments were so real that the moment I wore the headset I was completely immersed in the virtual environment losing touch with physical reality outside the headsets and beyond my sight. The clarity and the high definition precision of the virtual environments were fantastic, I could imagine this technology's potential the moment these environments get augmented with our reality. The thought of it, itself is astonishing. Until very recently, we were only able to augment our physical spaces with still art and media, where it was still easy to distinguish between the real and virtual elements. But now we can literally blur or say even erase the element of differentiation, through completely animated and controlled virtually created, high definition environments. The technology is here, only waiting for a vision to be realized. It excites me to think of the million possibilities it will open up. The easiest one to think of is the potential change it may bring to our idea of tourism, virtual tourism is just around the corner, and there already exists virtually detailed environments for famous landscapes and tourist destinations. This can revolutionize travel and make it affordable to masses, for those who cannot afford to spend money to travel to other places, the places themselves would be available at their doorstep. It can at least expand our understanding of travel and tourism in new unimagined ways.

There are many concerns with regard to the effect it may have to our sense of reality, our understanding of world, our perception and also our physical existence. Researchers are curious to know if it is possible to completely cut off reality and life in virtual environments. Experiments are being done to study how many hours it would be possible for someone to spend in a virtual environment and if it is possible to successfully have a person spend up to 48hours in a virtual environment without removing virtual reality headsets. My interest in technology is to study its potential to re-invent and revive our physical environments to create new forms of Heterotopia. The potential that technology holds to recreate spaces to allow for free and creative expression, to encourage innovation by immersing people in a conception where imagination blends with reality in such a way that it serves as an inspiration for people to create their own imagined experiences and visions. A new type of Heterotopia which inspires new versions of creativity to flourish, and new ideas to take birth. I will explore and discuss some available technology and share some ideas in which we can incorporate this technology to rejuvenate our day to day experience of urban spaces later in Part 5.

Framework

This framework (Fig. 8) proposed by Francis Ching in his book Form Space and Order gives an overall idea to understand any physical environments. The framework is an overview of elements that contribute to creating any spatial configuration. "This graphic analysis illustrates the way architecture embodies the harmonious integration of interacting and interrelated parts into a complex and unified whole" (Ching. F., 1943). For a detailed understanding of the application of each of these rules, one can refer the book, Form, Space and Order. For the purpose of my research, this framework was very useful, as it lays a foundation to refresh our understanding of the basics of architecture of a given space before one tries to further investigate the association of spaces/ built environments and its elements with human emotions.

In this section of the report, I introduce the idea of Physical and Virtual spaces and refer to a framework to understand these spaces. This is essential to further study the effect of our choices to design these spaces on human beings at both physical and emotional level. Form space and order covers physical aspects of design, In the following section I refer to the psychological aspect of design to build an overall understanding of the interaction between spaces and human beings.

...& Orders

ierarchy	Physical	Form and Space Solids and Voids Interior and Exterior	Systems and organizations of Space Structure Enclosure Machines	
	Perpetual	Sensory perception and recognition of the physical elements by experiencing them sequentially in time	Approach and departure Entry and egress Movement through the order of spaces Functioning of and activities within spaces Qualities of light color texture view and sound	
	Conceptual	Comprehension of the ordered or disordered relationships among a building's elements and systems, and responding to the meanings they evoke	Images Patterns Signs Symbols Context	
				Technics refers to the theory, principles, or study of an art or a process.
er e				
elements ns and				
nd slabs. pproach and				
volume s				
e levels, in ce foyer	Context	A simple exterior form wraps around a complex interior organization of forms and spaces Elevating the main floor provides a better view and avoids the humidity of the ground A garden terrace distribute sunlight to the spaces gathered around it.		

Architectural Systems

Spatial System	Organizational pattern, relationships, clarity, hierarchy Formal image and spatial definition Qualities of shape color texture scale proportions Qualities of surfaces edges and openings
Structural System	Approach and entry Path configuration and access Sequence of spaces Light, view, touch, sound, and smell
Enclosure System	Structure and enclosure Environmental protection and comfort Health, safety, and welfare. Durability and sustainability
Circulation System	User requirements, need, aspirations Sociocultural factors Exonomic factors Legal constraints Historical tradition and precedents
	Site and environment Climate: sun, wind, temperature, precipitation Geography: soils, topography, vegetation, water Sensory and cultural characterisitcs of the place
	The three-dimensional integration of program elements and spaces accomodates the multiple functions and relationships of a house
	A grid of columns supports horizontal beams and slabs. The cantilever acknowledges the direction of approach a the longitudinal axis.
	Four exterior wall planes define a rectangular volume that contains the program elements and spaces
	The stair and ramp penetrate and link the three levels, and heighten the viewer's perception of forms in space and light. The curved form of the entrance foyer reflects the movement of the automobile.

Fig. 8: Illustration to reflect framework for designing environments; proposed by Francis Ching, Form Space and Order exctracted from Ching, F. (1979)

Part 3

Psychology Of Design

How does spatial design affect human psychology?

Understanding the Psychology of Design

Spaces and Us

We spend a considerable amount of our life-time in built environments, surrounded by walls, and most of the time we completely disregard the type of ceiling above us and sometimes even ignoring the patterns of the tiles on the floor beneath us. Most spaces surrounding us are man-made. Without realization, our responses to these built environments feeds back to shape our behaviours. We all vaguely realize our response to our built environment; but may have little time, or inclination to understand this response in detail. For example when sitting inside an office with a glass façade, imagine your desk is positioned in a way that on a bright sunny day the sun directly shines upon our eyes through the glass wall, the uncomfortable glare one experiences may disrupt the work-plan for the day, and the same situation may get even more uncomfortable, if it is summer time and there is inadequate air-conditioning. The glass wall may be the reason why you waste a whole day without being productive at work.

To provide a more uplifting comparative scenario, imagine walking into an empty church on a normal day. The moment you walk-in there is not a single person inside the church, absolute silence. You can hear yourself breathing, the echo of your footsteps following your movement. You notice your attention drifting to the paintings within the niches on the side-walls, drawing you to the sides. You notice the arch of the niches neatly defining the shape of the paintings. The light yet noticeable sensation exerted by the volume of air above your head forces you to look up, mostly as an urge to confirm how high above the ceiling is. Unknowingly you notice yourself intrigued to understand the patterns on the ceilings, the bright colors of the artwork makes the ceiling look like a stretched fabric on arched ribs, perfectly intersecting right along the centre-line of the ceiling. The arrangements of seating on the floor slowly instructs your movement forward to the altar. Once you realise you've reached the end of the aisle, right in front of the altar, you observe the cross with an idol of Christ, looking mystical against the naturally glowing backdrop of stained-glass fixed on a pointed arch like opening; filtering sunlight into the interiors. The colored light from the stained glass backdrop makes the parts of the altar in shadow equally interesting as the parts in light. The warm feeling on your skin, due to the focused light from the sun falling through a clear skylight above your head entice you to look straight out to the infinite sky, as if carefully staged to make you realise the infinity beyond our understanding, simultaneously unsettling and comforting. The sound of the foot-steps walking towards you from the entrance breaks your trance, only to bring you back to the present, then you notice your fellow friends going through the same experience. On your way back your experience is augmented by the stories that your friends share and the memory of the stories you read in the books. You either ignore your feelings and experience completely, or start believing in the super-natural, but rarely giving the architect due credit for (tricking) your brain by staging a movingly immersive experience of the mystical.

Fig. 9: Gothic aisle and nave — at Southwark Cathedral. (Photograph by: Ryan Christopher Sequeira)

Emotional heart and the Rational mind:

"Common accounts of the make-up of the human mind draws sharp distinction between the stuff of cognition- perceiving, thinking, reasoning and declining and the woollier territory of feelings, urges and emotions" Collin Ellard. We often refer to the battle of a reasoning mind and emotional heart. Our movies and mythology is filled with examples that discuss the conflict between the two, and the conundrum we all face in our everyday lives while choosing between the two. The feedback between emotions and thought processes guide our behaviours, not only that the emotions play an important role in regulating our rational behaviours but also vice a versa. Extending this thought further, we can say, when environment influence our behaviours by dictating our actions and interactions, in-turn it also affects our emotions, and hence our mental state, well-being.

There are number of studies that reveal that extent to which we believe our environments influence our thoughts which control our minds, and our feelings is underestimated. New studies in this field urge designers to pause and study the effect our built-environments on our psyche and behaviours. With increasing intrusion of technology, the construct of our built environments is changing rapidly. When in some ways its easing restrictions by providing more options; in other cases technology is responsible for adding new types of constraints, subtly outlining the framework of human behaviour in these new hybrid environments. Technology and its effects on human behaviour is another area of study that needs attention, so as to effectively garner its potential to our advantage.

After investigating the relationships between spaces and human emotions, studying its relationship with human tendencies, I dive into exploring the Philosophy of Heterotopia and its application in designing spaces that can foster creativity and innovation in the next section of this report. The summary sheet of all the emotional triggers along with the associated spatial configuration is provided as a Framework 01 to assist the designers and architects in understanding spaces. This can be used as a guideline in conjunction with the final framework 03 which is proposed in the Part 6 of this report.

Just like emotions trigger actions and responses in human being, there is another aspect of **Human tendencies** which can help us understand "Why we do what we do". This concept was studied by Mario Montessori, Son of Maria Montessori who is famously known for providing framework and philosophy of education for kids. He draws his framework by thoroughly investigating human tendencies in detail, and suggests that having this understanding can give purpose and meaning to design of almost any framework to assist human growth and progress. In following few pages, I summarise his theory and align its application to design of environments.

Human Tendencies

"Human Tendencies" a term used by Mario Montessori, borrowed from contemporary psychologists, to describe dispositions that help humans to survive and adapt in a particular time and environment. He addresses this topic in the pamphlet "The Human Tendencies and Montessori Education" which is based upon his 1956 lecture entitled "The Tendencies of Man". (Montessori M., 1956) Maria Montessori determined that there are human tendencies that exist in each individual which stimulate her/him within the society and, serve to address and fulfil Human Needs (self-preservation, orientation, order, communication, imagination, movement/ transportation, logical processing, social connection, nurturing, self-protection (Hendron R., 2011)). Human tendencies are unchanging and individual. They help humans to survive and adapt in a particular time and environment (Kosky D, n.d.).

According to Mario Montessori, Human tendencies help human beings in the formation and continual development of the individual personality, in his or her continual adaptation as a person of their time, place and culture. Understanding of Human tendencies can help us develop better framework for our designs so as to align the goals of a 'designed environment' to assist the continual development of individuals, therefore societies.

These Human Tendencies as explained by Mario Montessori, with a few recent additions are listed below:

Fig. 10: Visual representation for the Human tendencies is my contribution by adopting and recreating icons made by Freepik from www.flaticon.com

Orientation: "Human beings want to know their relationship to the environment around them. When children enter a new environment, they often want to look at and touch everything around them. They enjoy knowing "where" they fit in - from learning their address to finding their country and continent on a map" (Montessori M., 1956).

Keeping in mind the tendency to orient, one can comprehend and appreciate role of signage in way finding. On a talk at Media Architecture Summit at University of Toronto Professor Tanya Toft shared an example of a street in Sao Paulo where the outdoor ads on streets are banned. Although it may sound like an interesting ban, which may free architecture of flashy ugly advertisements, but as an unwanted consequence of the ban, all the streets look the same in late hours of the evening, and often make people lose a sense of direction and orientation and induce unnecessary anxiety of feeling lost.

Fig. 11: Images here are artist Nicolas Damien's impression of streets in Tokyo with without signage (Image Source: http://www.nicolasdamiens.com)

Thigmotaxis is another behavior attribute typical to humans which help them navigate in space. Absence of walls or solid structure along the walkway can make people feel uncomfortable in a huge open space.

Order: "People prefer order to chaos and confusion. Order brings predictability and security. There are two kinds of order: external and internal. An orderly classroom (external) helps children to have orderly thoughts (internal)" (Montessori M., 1956).

State of order helps our brain relax, as the brain can easily pattern the information related to the space they are in and find it easy to navigate. Places with order makes its inhabitant comfortable. Generally places that are meant to relax or focus should be designed keeping the human tendency to seek order as a priority. At the same time one should realize that over simplification in effort to bring order may make spaces mundane and boring, resulting in uninspiring and dull environment. Finding a balance in order and a little bit chaos is a key to interesting designs.

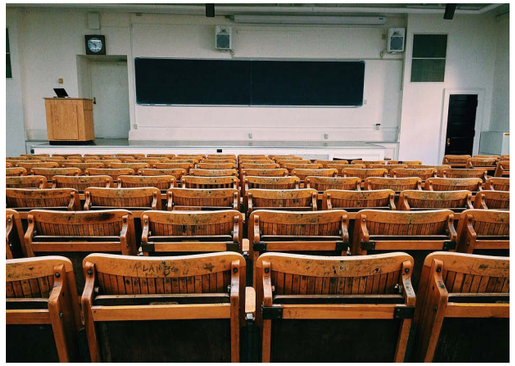


Fig. 12: Classroom design is meant to bring order and allow students to focus; the arrangement of chairs and table in orderly fashion encourage discipline (Image Source: www.pixabay.com)

Exploration: "**Our earth is filled with wonderful sounds, scents, textures, tastes, and colors. Children are naturally curious, and love to use their senses to learn more about the fascinating world around them"** (Montessori M., 1956).

We all love travelling, we visit places to explore different cultures, architecture and lifestyles, to learn something new; in search of novelty. Our sense of exploration is a byproduct of our curiosity to understand and comprehend the world around us. This does not mean exploration can be satisfied only by leaving a city or a country, but it can also be incorporated as a feature inbuilt in any space we design based on its utility. Once we understand exploration as basic human tendency we can design spaces to assist the sense of discovery than building mere enclosures. Off course without disregarding the basic function a space may need to serve we can still include elements of interest in its architecture and planning. This can make the space-discovery as exciting an experience as the function it's designed to serve.

Communication/ Expression: "Humans delight in conveying thoughts, feelings, and information to each other. Various types of communication include the written and spoken word, touch, facial expressions, gestures, art, music, and dance. Communication is the link of understanding between people, both face-to-face and from generation to generation" (Montessori M., 1956).

Fig. 13: Art as mode of expression (Image Source: www.pexels.com)

Fig. 14: Moai, Easter Island. (Image Source: www.pixabay.com)

Language is a most complex form of communication, devised by human beings to share their subjective experiences with one another. Language is a used to express and describe internal feelings and thoughts in such a way that it can be comprehended by other people to understand exactly what is being conveyed. Language is descriptive, as well as generative. It can create situations and change or alter them. Designers can use assistance of language to create experiences, also with a careful understanding into the human tendency to express, their designs can allow for new experiences to be generated.

At Media Architecture Summit, 2016 held in Toronto, Rafael Lozano- Hemmer presented his project called “Voz Alta, (Loud Voice), a memorial commissioned for the 40th anniversary of the student massacre in Tlatelolco, which took place on October 2nd 1968. In the project, participants speak freely into a megaphone placed on the “Plaza de las Tres Culturas”, right where the massacre took place. As the megaphone amplifies the voice, a 10kW searchlight automatically “beams” the voice as a sequence of flashes: if the voice is silent the light is off and as it gets louder so does the light’s brightness. As the searchlight beam hits the top of the building of the Ministry of Foreign Affairs, now Centro Cultural Tlatelolco, it is relayed by three additional searchlights, one pointed to the north, one to the southeast towards Zócalo Square and one to the southwest towards the Monument to the Revolution. Depending on the weather, the searchlights could be seen from a 15Km radius, quietly transmitting the voice of the participants over Mexico City. Anyone around the city could tune into 96.1FM Radio UNAM to listen in live to what the lights were saying” (Hemmer R.L., 2016).

This project was able to get thousands of people to participate, without censorship or moderation. Participation included statements from survivors, street poetry, shout-outs, ad hoc art performances, marriage proposals, calls for protest and more. This was a project designed to bring together masses on a subject which was sensitive to the city of Mexico, made people freely express their thoughts and let go of the anger and sadness they have been holding in, to commemorate those who lost their lives in the massacre. The project did not only help people express themselves but through expression create an atmosphere of reconciliation. Each expression invited new expressions, people participated to make peace with their past through free expression.

Activity: “People generally like to stay busy. For children, movement can be enjoyed for its own sake, rather than always having a goal or end product in mind. Even children who have very little to play with will find ways to be active through games, songs, dance, and pretend play” (Montessori M., 1956).

Activity is interesting human tendency that makes sure human beings are always occupied with something, whether its physical activity or mental activity, in our waking state we are always active. If not active, we are sleeping. Which also is an activity which brain engages to ensure sufficient rest before it gets to being active again.

Most spaces are either designed to accommodate activities or to assist in facilitating ‘rest’, which is opposite of activity. If the designers are clear about the function a place is supposed to serve, they can be more aware in their choices and offering in their designs. Places that offer activity can either be designed to keep people physically active or engage their minds in mental activity. The important step is to note the kind of activity a space is supposed to serve, and once the purpose is clear, designers can make aware decisions to create an atmosphere to facilitate and accommodate the desired activity.

Manipulation: “Humans need to take hold of their environment to understand it. It is the next step after exploration: once you have found something interesting, you will quite naturally want to use it in some way. This is how the concept of “tools” began” (Montessori M., 1956). Just like expression, manipulation is another human tendency that act as a method deployed by human beings to own a situation, to have their own name and control over a space or situation. Again, the understanding of this human tendency does not mean that all space should allow for manipulation or should be capable of being manipulated, but the very awareness to allow for manipulation or not, can help the design of a space to positively uplift an experience.

Work: Humans feel worthwhile through their work. Work leads to a feeling of accomplishment and self-respect. Maria Montessori believed that it was through work that a child constructed his true self, free of defect or misbehavior.

Designers should be aware if the space is to offer an environment for work, play or rest. So that the elements of the space can be chosen accordingly to design a space to assist focusing thoughts or instill playfulness. Some work ethics allow for play as a part of work, in such a situation, one can find a balance between the two and make deliberate design choices to stage a playful atmosphere with spaces or corners to focus and concentrate to strike a fine balance.

Repetition: “This occurs when a child repeats a task over and over again. Oftentimes it is with the intent to master the task, but even after mastery occurs, a child may continue to repeat the activity for the sheer pleasure of doing so.” (Montessori M, 1956)

Repetition is a hack to trick brain into making patterns, our brain learns through patterns. We look for patterns and retain the information or accept it as truth is it is experienced as a repeated sensation. Most of our scientific research and findings are based on identified patterns. This process for qualifying scientific research is learnt from the understanding of the way in which our brain patterns and qualify information. We learn through repetition. We also retain information through repetition. Repetition can thus be used to create an impact or deliver a message so that we register its importance.

For example, the advertisement are designed based on this very principle of repetition. By repeating the brand name and tag line, the commercials make sure we retain the said information for a long time. And by retaining the information, we are bound to choose the said brand over others as we find it familiar and trustworthy only because of our mere tendency to remember “repetitions”.

Exactness: “Have you ever seen a child get upset because something was put back in the wrong place? Or watched them line up their blocks neatly before building a tower? Instinctively, humans seek to be precise in their work. Doing something exactly right brings enormous satisfaction” (Montessori M., 1956).

Exactness is our tendency to find answers to the lingering questions, to resolve puzzles and mystery. As much as we enjoy mystery, we all feel the urge to solve puzzles and find “right” answers to the questions. This urge is what keeps us alive. Exactness is complementary to curiosity. We are curious to seek new information, to find new information, we ask new questions, and new questions lead to “right answers” (although sometimes, these answers are wrong, but we strive to find right answers). Exactness serve as an obsession, which ensures progress through generation of new knowledge.

Fig. 15: The Weeping Woman, Painting by Pablo Picasso, (Image Source: NichoDesign , http://bit.ly/2irsv8d)

Abstraction: "This is truly the characteristic that sets us apart from animals. We are able to visualize events that have not yet occurred; we are able to feel and express emotions that are not tangible. We can imagine something that exists only in our minds, and then take the steps to make it happen." (Montessori M., 1956)

We all strive to create our own versions of truth, so as to leave a mark our personalize statement, to exclaim we exist. Through abstraction we can personalize truth. We abstract an idea before we can realize it. It's a method to play things out in our head before we actually realize it, to conserve energy and making smart decisions and quick progress. Abstraction is a form mental activity which can be achieved in a space which allows for a little bit of isolation, not necessarily a space to rest but a space where one can have a monologue or reflection so to abstract an information or create a mental imagery before we share it with others, by bringing the information to a communal space of reality.

Perfection: "All of the tendencies culminate in this one. Once we have explored, manipulated, and worked in our environment, we can perfect our activities. In doing so, we are masters of our own minds and bodies as well as the tasks we set out to do" (Montessori M., 1956).

We are inspired by 'perfection'. We look forward to perfection in everything, our life experiences are happy or sad based on our idea of 'perfection', as we constantly keep referring to our template of perfection to make decision about our experience. Before we rate it as good or bad we qualify its standards against our understanding of 'perfect'.

Although perfection can be a subjective experience, we can achieve basic standards of perfection if we ourselves find or feel the experience to be perfect at first place, then we can test the same with others, augment the results and set our design criteria based on our survey to understand 'perfection'.

Fig. 16: The Taj Mahal (c. 1653) in Agra, India has a clear, hierarchical shape with a tri-partite arrangement, a top, middle, and bottom not unlike a face; it can also be seen, not incidentally, as a study in curves, another form humans innately prefer (Image Source: www.pixabay.com)

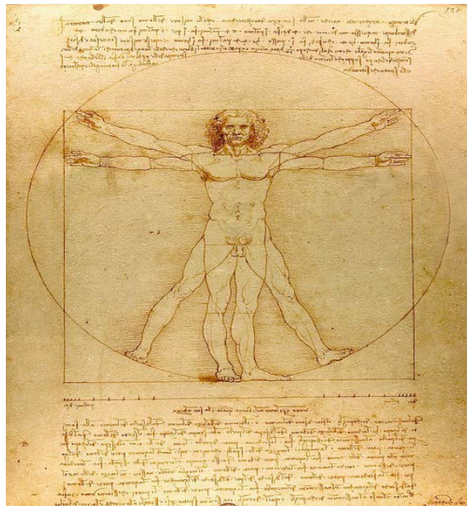
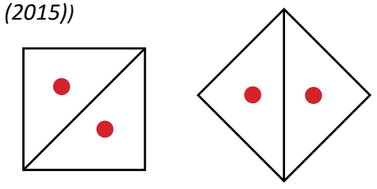


Fig. 17: (on the left): Vitruvian Man, by Leonard da Vinci, c. 149O, with his text surrounding it, illustrates a Renaissance ideal: man's perfection within nature and embraces the classical notion of nature's perfect geometries. To get this to work, da Vinci ingeniously places the center of the circle in the man's navel and the center point of the square in his genitals (Image Source: www.pixabay.com)

Fig. 18:(Below): In psychological tests, subjects consistently picked a pattern symmetrical around a vertical axis as more attractive than one symmetrical about a non-vertical axis (Illustration developed to explain the concept extracted from Sussman, A., & Hollander, J. B. (2015))



To the list proposed by Mario Montessori, there have been a few other human tendencies being studied and proposed by various psychologists which includes:

Biophilia:

"Man is an outdoor animal. He toils at desks and talks of ledgers and parlors and art galleries but the endurance that brought him these was developed by ancestors, whose claim to kinship he would scorn and whose vitality he has inherited and squandered. He is what he is by reason of countless ages of direct contact with Nature."

- James McBride, M.D., Journal of the American Medical Association. 1902.

Fig. 19: Fractal beauty in a romanesco calabrese cauliflower. Self-replicating forms fascinate us: our interest in these patterns has been linked to our evolution and observation of similar arrangements, such as tree patterns, in nature over eons (Image Source: Wikimedia Commons)

“E.O. Wilson (1984) coined the term ‘‘biophilia’’ to refer to what he and his colleagues hypothesized is a fundamental, genetically based human need and propensity to affiliate with ‘life and

Life-like processes’. Studies have shown, for example, that even minimal connection with nature—such as looking at it through a window—can promote the healing of hospitalized patients, can increase health in the workplace, and can reduce the frequency of sickness in prisons. In hundreds of other studies, interaction with pets has been shown to benefit a wide range of clinical patients—from adults with Alzheimer’s disease to children with autism—as well as people within the general population. Young children develop rich interactions with animals. Based on preference ratings for different sorts of landscapes, people tend to prefer natural environments more than built environments, and built environments with water, trees, and other vegetation more than built environments without such features. Indeed, it would appear more than a mere cultural convention that flowers are often sent to people who are in the hospital or who are going through periods of mourning. The need and propensity to affiliate with nature appears great, as do the resulting benefits” (Kahn, P.H., 2009).

Fig. 20: We have a predisposition for enjoying natural scenes is in our genome. Given the means, we embellish the view (Image source: www.pixabay.com)

Hedonic Adaptation (Familiarity):

“Man is a pliant animal, a being who gets accustomed to anything.” – Fyodor Dostoyevsky

Hedonic adaptation occurs in response to both positive and negative experiences. Not surprisingly, however, if individuals’ overarching goals are to increase or maintain well-being, then their objectives will diverge depending on whether their fortunes have recently turned for the better or for the worse. The negative domain calls for activating and accelerating adaptation. The positive domain necessitates slowing down or thwarting (Lyubomirsky S., 2010).

Hedonic adaptation has both positive and negative effects, it can help us make strange, familiar and hence get us to feel comfortable in a new environment. But by doing so, this tendency also can make an experience mundane. As we are generally interested in an experience until we get used to it. The moment we have cracked its mystery or patterned its excitement as familiar, it stops exciting us. It starts to become normal and then mundane. This is one reason why, even though we like discovering things, we like it only until it’s discovered, once it’s discovered our brain is no more enthused by it. Once we have patterned the experience, and made it familiar, we revisit it only if we like it. We generally tend to like novel experiences or once those that makes us feel good. Designers should remember this human tendency to counter its effect by leaving room for discovery and excitement in their designs.

Hedonic adaptation can be experienced while walking on city streets which all look the same, we are no more excited by its organization and design. We get used to its identical nature and the streets become invisible to us, we walk up and down the street without noticing its details, as our brain has already patterned it. We drift into imaginations or thinking mode. This can be harmful in case of a busy street where we are no more present, no more alert about our surroundings as the street fails to capture our attention. This can result into mishaps or accidents in extreme situation.

The Nature of Emotions

“Human emotions have deep evolutionary roots, a fact that may explain their complexity and provide tools for clinical practice.” Robert Plutchik

In his paper on the Nature of emotions Robert Plutchik, professor emeritus at the Albert Einstein College of Medicine and adjunct professor at the University of South Florida, shares his difficulty on mapping and studying emotions. He alludes to various disagreements amongst many contemporary theoreticians concerning the best possible conceptualization of ‘emotions’, and that it is one of the most confused chapters in history of psychology, with more than 90 definitions of emotion proposed over the course of 20th century. The fact that emotions are experienced at very personal levels as ‘internal feelings’, it has been a problem to aggregate results to understand emotions at a universal level.

Fig. 21: Artist rendering of an ancient human settlement (700,000 years ago) (Image Source: Wikimedia Commons)

To resolve this dilemma, University of Iowa neuroscientist Antonio Damasio suggests a method. He says, “When the amassing of data does not resolve a complex issue, it may be necessary to find new ways to conceptualize the problem.” Robert Plutchik furthers this idea by proposing deployment of evolutionary theory to unify a number of theoretical perspectives. According to Rober Plutchik, we can put emotions into a functional framework by putting them together using tools and methods of evolutionary biology. We can define them in terms of what their adaptive function might be and thus understand better their biological basis and the apparent connections between them. The appeal in this approach may lie in the deep-seated sense of connectedness of all living things. In his paper he cites examples to suggest that emotion, cognition and action interact in feedback loops and that emotion can be viewed in a structural model tied to adaptation.

“Emotion is a complex chain of loosely connected events that begins, psychological changes, impulses to action and specific, goal-directed behaviour. That is to say, feelings do not happen in isolation. They are responses to significant situations in an individual’s life, and often they motivate actions. In the emotional chain of events, Cognition is at the beginning of the chain…Emotions are not simply linear events, but rather are feedback processes. The function of emotion is to restore the individual to a state of equilibrium when an unexpected or unusual events create disequilibrium.Emotions can cause one’s muscles to tense; it can be expressed as a facial gesture, a clenched fist or an action such as running, attacking or yelling. Impulses to action are not always followed by action, often for fear of retaliation or embarrassment. Even when they are, overt behaviour is not the end of the emotion process. Such behaviour generally has an effect on the stimulus or condition that started the chain of events in the first place.” Robert Plutchik

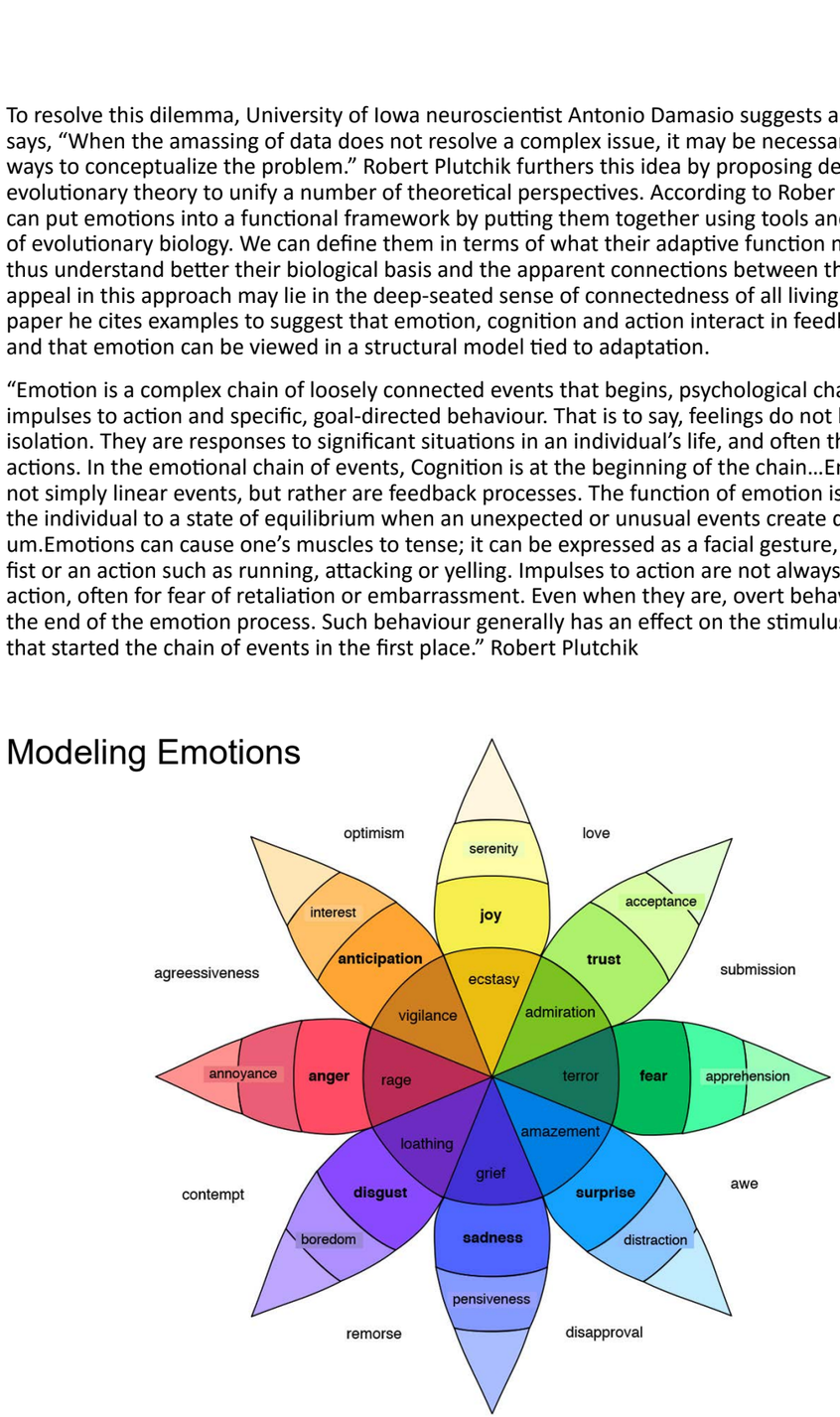


Fig. 22: Wheel of Emotion by Robert Plutchik, 1958. (Image Source: Wikimedia Commons)

Given an understanding that emotions can be a confusing concept to comprehend with so many similar feeling emotions with overlapping meanings, Robert Plutchik in 1958 proposed a brilliant wheel of emotions with a set of primary and complimentary emotions, associating each emotion with colors on the color wheel, furthering the idea offered by William McDougall who first noted the parallel between emotions and colors in 1921. The color wheel became an essential component of his diagram as following its principle he could organize analogous emotions together close to each other with the opposing emotions 180 degrees opposite apart.

The model shows basic bipolar emotions such as Joy verses Sorrow, Anger versus Fear, Acceptance versus Disgust and Surprise versus Expectancy. This model is exciting as it not only explains basic emotions but also elaborates related set of emotions anchored to the basic ones.

Understanding of the escalation of each emotion (from the outside to the inside of the wheel of emotion) beginning from the corresponding lighter shade of the color to the dark saturated shade explains how emotions can escalate if the exposure to the triggers is prolonged. For example, Apprehension as an initial emotion can escalate to fear and fear can escalate to terror. Thus if one is able to control or allow the escalation of human emotion, one can regulate the emotional responses to a given experience. For example, the designer may not want to allow escalation of Apprehension to Terror but would want to escalate acceptance to trust and admiration. Some of the other commonly experienced emotions are derivatives of positive or negative emotions listed in the wheel of emotions. For example, Excitement was described by psychologist Paul Eckman in 1972 as an outcome of Joy and Anticipation.

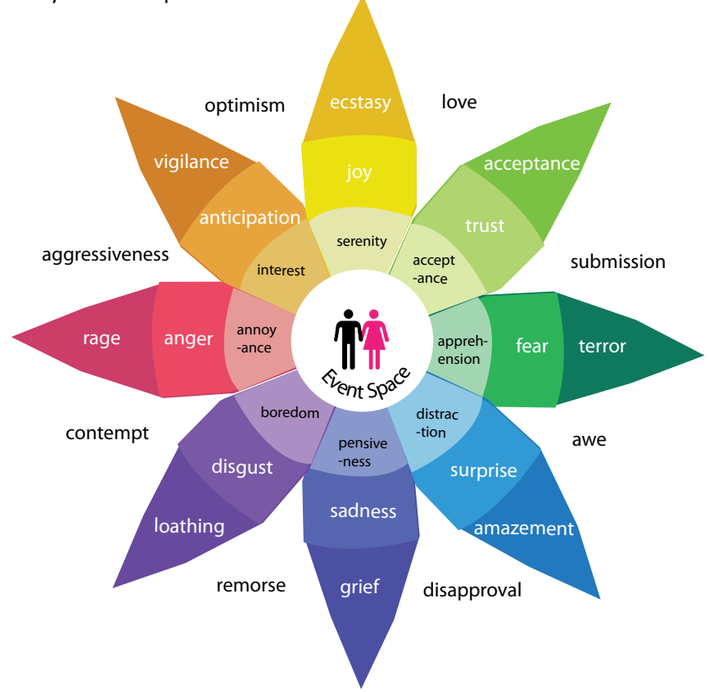


Fig. 23: For the purpose of my research, so as to include the understanding of wheel of emotions in the final framework, here in the above diagram, I have inverted the emotions, with the mild emotions near the centre to the strong emotions on the outside to illustrate the escalation of emotions, as one may experience in an event space. (Author’s work)

The wheel of emotion can help us further understand the relationship of spaces and human emotions. When we place human experience in a given space at the centre of the wheel of emotion, one can notice that human beings generally experience escalation of emotion from mild to strong, figure 6 reflects the same understanding where, I have inverted the wheel of emotion, by placing the mild emotions near the centre and the strong ones on the outside. This method of representation of emotions, supports me to include this understanding in the final framework I propose later in the report.

n the following pages of this section, I delve into all 8 types of primary emotions along with the related ones. I outline their relationship with the spatial configurations, which can trigger emotions and further escalate into reactions in response to the emotional state induced by the triggers. The label to each emotional trigger in the following description also suggests the direction of escalation, for eg. Apprehension can escalate to Fear and Fear can escalate to Terror; therefore Apprehension -> Fear->Terror.

Apprehension → Fear → Terror

Jonathan Rottenberg in his book, The Depths: The Evolutionary Origins of the Depression Epidemic alludes to the fact that, “At any given point, 22% of the population exhibit at least one symptom of depression and the World Health Organization projects that by 2030, depression will have led to more worldwide disability and lives lost than any other affliction, including cancer, stroke, heart disease, accidents, and even war.” In such a state of transition, where more and more people are getting afflicted by depression and mental disorders, it’s important to study emotions in detail. The researchers, led by Dr Andreas Meyer-Lindenberg of the Central Institute of Mental Health in Mannheim, Germany, discovered that city dwellers’ brains, compared with people who live in the countryside, seem to be more prone to mental disorders. Meyer-Lindenberg and his accomplices looked at two brain regions: the amygdalas and the perigenual anterior cingulate cortex (pACC). The amygdalas are known to be involved in assessing threats and generating fear, while the pACC in turn helps to regulate the amygdalas. In stressed citydwellers, the amygdalas appeared more active on the scanner; in people who lived in small towns, less so; in people who lived in the countryside, least of all. At the same time urban living was found to raise the risk of anxiety disorders and mood disorders by 21% and 39% respectively (The Guardian, 2014). Amongst many other reasons, city planning and design of built spaces played an essential role in influencing the research outcomes.

Rottenberg suggests that affective science; the empirical study of mood - lies at the crux of the understanding the state of depression. He defines moods as “internal signals that motivate behavior and move it in the right direction,” he argues that our bodies are “a collection of adaptations, evolutionary legacies that have helped us survive and reproduce in the face of uncertainty and risk” and outline the backdrop of understanding depression.

Moods, Rottenberg explains, “are an overall summary of the various cues around us [and usually] are harder to sort out.” Our deeper reliance on moods rather than feelings is one of the things that make us human and different from other species, a difference empowered by our use of language and symbolism. Symbolism is very much an inherent part of the environments we live in. We are surrounded by symbols, from those of religious, political, and social significance. Architecture is in it’s true nature a symbolic representation of ideas instantiated in a physical form via brick and mortar. Proportions and scale of spaces around us may have symbolic reference. For example, gigantic proportions of buildings can make you feel small and powerless, induce apprehensions and affect the way we navigate around the space. Consider a Church, or any religious monument, you may not find many material differences between a religious building from that of any other building, but one

Fig. 24: Top and Bottom Left: “Forest of columns” National Stadium of Brazil Mane Garrincha – Brasilia. The gigantic proportion of columns, belittling human scale can induce apprehension escalating to fear inducing uncomfortable feelings and restlessness. (Image Source: www.pixabay.com)

Bottom Right: Illustration to reflect the proportions of Column against Human scale (Author’s work)

of the defining differences being the stories we tell ourselves about the respective religious structure. The moment we walk into any religious building, we are surrounded by a series of references through symbols, metaphors and stories, which influence our thoughts and feelings that we experience inside the building. Although not disregarding the planning and designed volume of space which stay contained within enclosure of brick and mortar, the virtual yet influential cultural constructs made of language and symbols play an important role in our overall experience of spaces, hence regulating our moods and emotions.

“Every year at the Hajj, a massive pilgrimage to Mecca involving more than five million participants, several hundred people are crushed underfoot when the crowds, reacting in part to the emotion of the event, challenge the limitations of the physical setting. Sporting events, street festivals, parades, and demonstrations sometimes similarly turn awry, causing human tragedy. The level of anxiety experienced by visitors to any built setting will influence their behaviour both at an individual level and at the aggregate level of the crowd” (Ellard, C., 2015).

Anxiety arises when we anticipate future events or are reminded of unpleasant past experiences. Anxiety is often experienced when we are unable to find an escape from a threatening situation, may it be a mentally constructed scenario or anxiety caused by physically restricting built space around us. In situations where we feel the need to escape a given situation, but are unable to access the exit route, we see ourselves getting caught in a panic mode and our reactions and decisions are often under the influence of a manic state of fear, feeling of being stuck or caught up in an unpleasant situation seeing no escape. In such cases we are forced to live in these highly tensed and uncomfortable locations of perceived threat giving rise to number of neural responses responsible for variety of mental disorders which also affecting physical health.

Fear of crime

Fear creeps in when one perceives a danger to their safety or losing their control over a situation, or when one feels disempowered, feeling weak with uncertainty in a given scenario. Dark, dingy and badly-lit public spaces are very common examples of spaces that can induce fear and anxiety in late evenings. Such areas are also prone to crime, theft and vandalism. “In a survey of fear of crime in a broad sampling of European countries, about one-third of respondents reported that they sometimes altered their behaviour and avoided parts of the city, altered planned walking routes, and changed the timing of the events of their lives, out of a concern for personal safety. American studies shows similar patterns. In one large U.S. study, fully 40 percent of respondents said that they would be fearful about taking a walk at night within a mile of their homes. Even when inside their homes, a substantial fraction of surveyed participants (particular women) reported some level of concern about home invasion” (Ellard.C. 2015).

Sociological causes leading to the feeling of disconnection with these environments can be a reason for our fears in particular environments. Our normal level fear can be related to our feeling of connectedness and lacking sense of community in a given environment. Even if the crime rates are low, the ‘fear’ of crime can still affect our day to day routine and lives. It can interface with our lives and induce stress and uncomfortable feelings. To avoid this, we must study the spaces, triggers and reasons that can be responsible to give rise to fear or anxiety of any kind. The fear of crime, affects our choices of commuting routes, the decisions to postpone or cancel plans altogether. Choices of our mode of transport, instead of walking we chose closed safe vehicles. The access to various options to select routes, afford a safer mode of transport, affect lives of people who can and can’t afford to pay extra money for safety in different ways. Designing public spaces with caution and care to avoid fear of crime is therefore very important to democratize the notion of safety. Reducing disparity by planning with awareness and deploying inclusive-design strategies for all types of public spaces to welcome all genders and user types all times of the day or night.

Examples of Apprehension → Fear → Terror

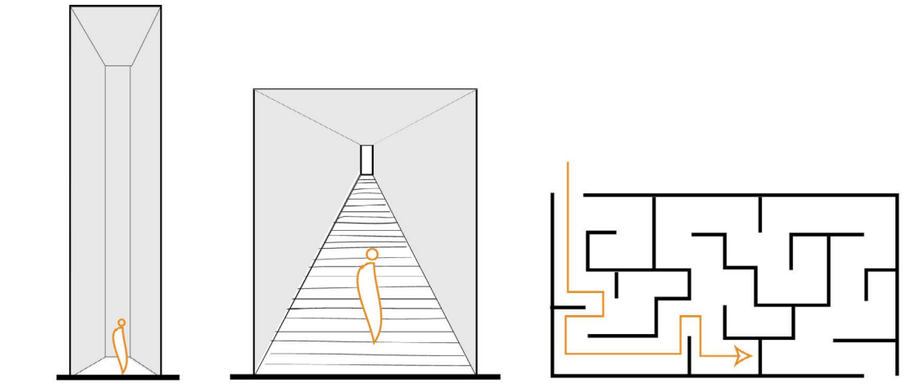


Fig. 25: Conceptual Sketch showing spatial configuration that can induce feelings of Apprehension, which can escalate to Fear and may lead to Terror (Author’s work)

Distraction → Surprise → Amazement

Almost every Labor Day weekend, the City of Toronto organises an airshow to delight the city-dwellers with amazement. This year I was lucky enough to be at home to witness the phenomenon live from the balcony of my apartment, when the crazy aircrafts painted the blue sky in the strokes of snow-white contrails. The clear blue sky of the September, when clouds were on vacation allowed for a perfect display of some dangerously beautiful stunts. This year’s airshow featured both solo and group aerobatics including the disciplined and elegant Canadian Forces Snowbirds, berserk-mad-lover Lucas Oil Pitts, gracefully fearless Breitling Jets, masculine U.S. Navy F/A 18F Super Hornet, intrepid Canadian CF-18 Hornet and some others. On all those three days of Labor Day weekend, the consistently peaceful Torontonian sky was transformed into a wild blue canvas, desperate to get soaked in meditative madness of otherwise angry workaholic fighter planes. The sight was amazing! Words fall short of expressing the excitement and enthusiasm it filled me with. I felt energised and inspired for the rest of the month, dreaming of the heart shaped cloud and the giant sized fireworks of the daylight. I felt myself celebrating the transcendent and miraculous capacity of humanity to defy gravity, playfully teasing laws of nature, like a child in the safety of their parents messing with the do’s and the don’ts.

Fig. 26: Airshow Toronto (Image Source: DJ Singh , http://bit.ly/2htN9WK)

> *I saw myself being pulled out of my daily rut, to a place of otherness where I was thinking of things I normally never had time to think of. Propelled with positivity, I felt enthused and hopeful. The airshow was not just a form of entertainment but a much needed dose of inspiration. The airshow made me experience fear, excitement, a rush of happiness, all at once! I was amazed. Made me feel one with every other proud Canadian who must be enjoying this airshow in a different spirit, as a display of the capacity at which their military can control and maneuver their aircrafts in the seemingly vast lonely sky. My feeling of amazement was binding me together with humanity. It was not a usual feeling of feeling close to your immediate neighbor or a family member or a friend, but it was more than that, it was a feeling of our collective capacity to harness and garner fiery laws of nature to our advantage. The feeling was empowering and uplifting yet unifying while bringing me closer to all my fellow happy human-beings.*

Accommodation describes the manner in which we may be required to adjust our world-view in response to the stimulus that generates a feeling of amazement. **At the crux of epiphanic experience is that it brings together two things, ideas, notions or even sensory experiences that are contradictory**. The only way to overcome our feeling of contradiction, the at-oddness of the experience is to adjust what we thought we knew of the world and sometimes on a grand scale. A good scientific example would be the mental struggle of a student of physics learning for the first time that light can be described as both a wave and a particle (Ellard, C., 2014).

My experience of the airshow was exactly the same, I was fascinated at the delicate and gracious display of life threatening stunts. The contradiction to the 'serious images' that one imagines while thinking of military was the playful and erratic performance by the very same military troops. It made me think of fighter pilots from the air force at a personal human level. From miles away from

the point of their performance in the sky to my balcony, I was able to connect with their feelings going crazy inside the upside-down aircraft. I was thinking of the artistic flare burning with same rage like that fire under my belly. The otherwise mechanistic conception of the military personnel in my head was now replaced by a creative masterful artist who was out of control and yet completely aware of his/her limits and boundaries. In this case the event was the anchor connecting the environment and the objects together. The event of airshow which was already by its very nature designed to be of grand scale perfectly orchestrated against the equally grand and vast background of Sky unknowingly engaging and curating the emotion of amazement.

Amazement is one of the essential emotion in favour of mankind that has helped us survive all along, by resigning to the mystery of the grand, something larger than us, beyond our understanding and comprehension, we feel elated and happy instead of feeling weak. This feeling has helped the competition, and hence the survival of the fittest, by encouraging resignation in the weak.

Examples of Distraction → Surprise → Amazement:

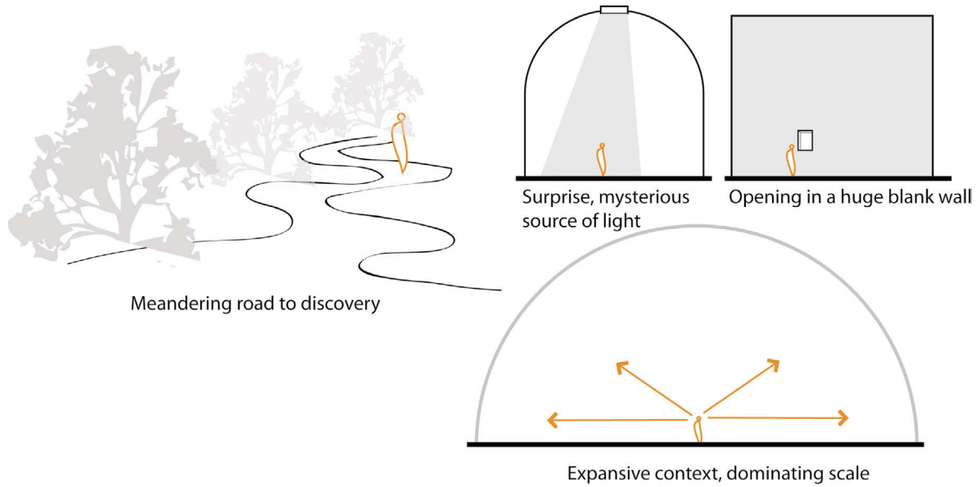


Fig. 27: Conceptual Sketch showing spatial configuration that can induce feelings of Distraction, which can escalate to surprise and may lead to Amazement (Author's work)

Pensiveness ⟶ Sadness ⟶ Grief:

Seasonal Affective Disorder is essentially seasonal depression most commonly diagnosed in patients during winters. Reduced exposure to sunlight is one of the common reason that causes seasonal affective disorder appropriately abbreviated as SAD. Although the absence of sunlight may not be only cause, its perceived effect is relevant enough that one of the most common treatments of SAD is light therapy, or 'phototherapy'. According to research, full-spectrum light like sunlight stimulates the release of serotonin, the neurotransmitter responsible for feelings of happiness, lack of serotonin can thus cause feelings of sadness.

"Our bodies usually produce large amounts of vitamin D3 (cholecalciferol), the most bioactive form, when our skin is exposed to sunlight. Vitamin D deficiency can also have a marked effect on mood, with studies showing that people with low vitamin D levels are far more likely to suffer from depression than those with higher levels." (Wilkins H. et al, 2006) Melatonin is another hormone whose

main function is to induce sleep by traveling through the bloodstream and transmitting the sleep message to other body systems. In healthy individuals the secretion of melatonin peaks in the middle of the night during our deepest sleep. At dawn, sunlight shining into the eye triggers the pineal gland to switch off the production of melatonin, thus removing the desire to sleep (Leppamaki S et al, 2003).

Other than the exposure to sunlight serving as a reason for psychological grief, there are several other factors that may induce a feeling of dullness and make people inhabiting a space feel sad and depressed. Mundane environments with nothing to stimulate our brain, can make us disengaged and uninspired. The first human civilization is only around 8500 years old (Ancient Mesopotamia, 6500 BC), when our early ancestors, Homo erectus, first appeared in Africa 1–2 million years ago, which is to say that human beings spent most of their history living in the nature, under the ever-changing sky, animated surroundings, constantly keeping human brain occupied. Our brains have evolved to its form today only by constantly learning from the environments deciphering patterns**. Our blank walls with dead ceilings only block our vision to serve its sole purpose to allow our brains to rest or focus. Just as overstimulation can exhaust us, mundane environments induce boredom and dullness. When our brain is no more engaged, with no patterns or puzzles to solve, it gets bored of the present, pushing us into the sadness of the forgotten past or drives us anxious by constantly worrying about the future**. Therefore to minimize boredom one can consider to make environments interesting, engaging to avoid our brain to shift towards the feeling of grief and resentment, designers must design experiences which are finely balanced with both natural and man-made built environments.

Examples of Pensiveness → Sadness → Grief

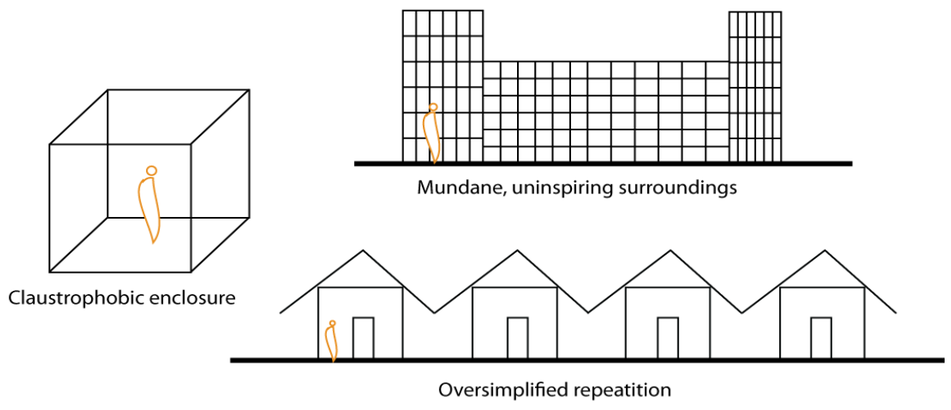


Fig. 28: Conceptual Sketch showing spatial configuration that can make one feel Pensiveness, Sadness or Grief (Author's work)

Boredom ⟶ Disgust ⟶ Loathing

Loathing or Disliking is the prime reason for dis-engagement. Dislike leads to disconnection and boredom. Boredom can be understood as Low-arousal state when you feel least connected to the present. Psychologists have always had prime interest in understanding Boredom. One of the definition for Boredom is that it's an inflated state of inexorably slow passage of time. "A kind of restlessness that may manifest as both an unpleasant and aversive inner mental state but also with overt bodily symptoms in the form of fidgeting; postural adjustment; restless gaze; and perhaps yawning." (Ellard C., 2015) Some recent development also suggest that boredom can sometimes result into high arousal state and high stress. (Berlyne D.) A research conducted by University of Waterloo cognitive neuroscientist James Danckert in collaboration with his student Colleen Merrifield participants were brought to the laboratory, hooked up to equipment that measured their heart rate and skin conductance by making the participants watch some videos which were fully calibrated to induce emotional states of one kind or another. They found that boring videos where there was no story to interest audience increased the cortisol levels of their participants compared to the level of cortisol while watching sad videos. (Danckert's J., et.al., 2014) The findings of this research suggest that even exposure to a brief, boring experience can be just enough to change the body chemistry and brain activity in such a way to generate stress.

Canadian psychologist Donald Hebb's research on environments and its effects on the brain discovered remarkable results. Their findings suggested that rats who lived in enriched environments were markedly superior intellectual beings than laboratory rats living in Spartan surroundings. Later research by Berkley's Mark Rosenzweig showed that such rats were not only superior intellectual beings but also had a thicker neocortex with more richly developed synaptic connections between brain cells. These findings are so fundamental that it would be surprising if they didn't apply to human-brain as well. Recent developments in neuroscience confirms that our brain possess a remarkable degree of plasticity. For example, musicians who engage in demanding practice of manual skills required for performance show measurable increases in brain activity and connection areas of their brains related to the skills. Similarly, there are many reported cases where children who were incarcerated in their homes by abusive parents for extensive periods of time have typically involved enormous emotional stresses and dietary impoverishment in addition to environmental deprivation. Although this doesn't exactly match the laboratory rats situation, but the closest example of lab-rat situation would be of prisoners in solitary confinements. Even brief periods in solitary confinement has shown that prisoners without any prior mental pathologies also experienced long-lasting delirium, impulsiveness, and self-destructive behaviour. Restrictions of social simulation are equally responsible for the mental stress in the case of prisoners as much as dark enclosure if walls. (Grassian S., 2006)

Urbanist Jan Gehl has specialized in using simple, clever and unobtrusive observations of urban behaviour in public places. Gehl observed that people walk more quickly in front of blank facades, compared to the open, active façade, people are less likely to pause or even turn their heads in such locations. They simply bear down and try to get through the unpleasant monotony of the street until they emerge on the other side, hopefully to find something more interesting (Gelh J., 2006)

Professor Collin Ellard through his research on understanding the effect of urban spaces on emotional states of human beings found out that people in busy street with lots of activities to engage their cognition felt lively with a positive level of arousal where as those in front of a blank façade of a supermarket expressed their feelings with words like passionless, bland, monotonous with patterns showing signs of boredom and unhappy feelings. (Ellard C., 2014).

Even without any sophisticated research we all realise through personal experiences that are boring inducing feelings of loathing and disengagement are unpleasant. To enhance our day to day experience therefore it is necessary to understand the emotion of loathing and design to avoid such feeling to reduce stress caused due to boredom.

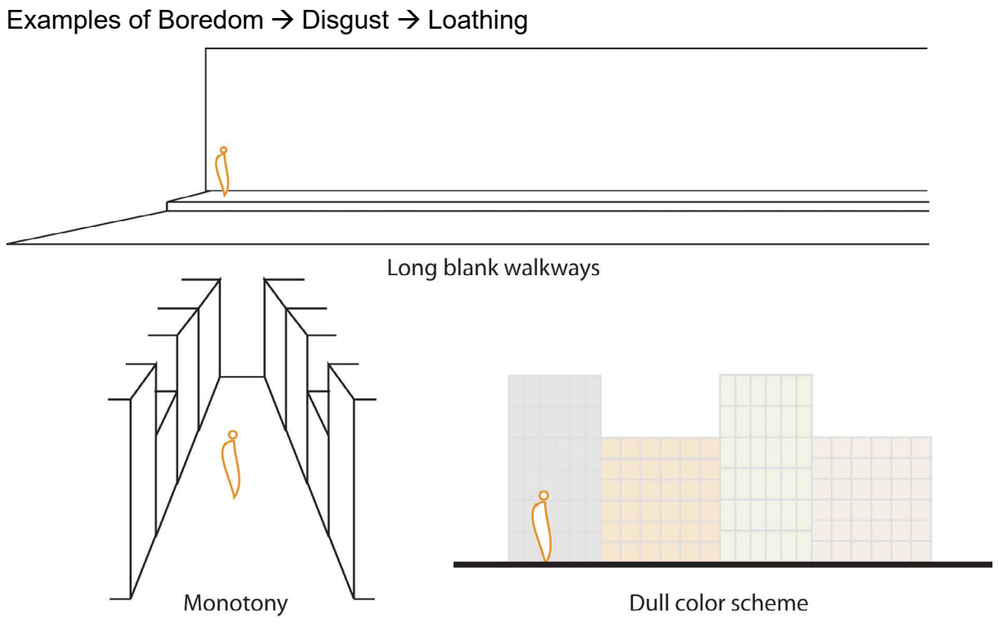


Fig. 29: Conceptual Sketch showing spatial configuration that can make induce Boredom, which can lead to feelings of Disgust or Loathing (Author's work)

Annoyance → Anger → Rage

Shape carry meanings: Bilateral Symmetry, Curves and complexity

> *"Eurhythmy is beauty and fitness… found when the members of a work are of a height suited to their breadth, of a breadth suited to their length and in a word when they all correspond symmetrically"*
>
> Vitrivius, De Architectura, 1968

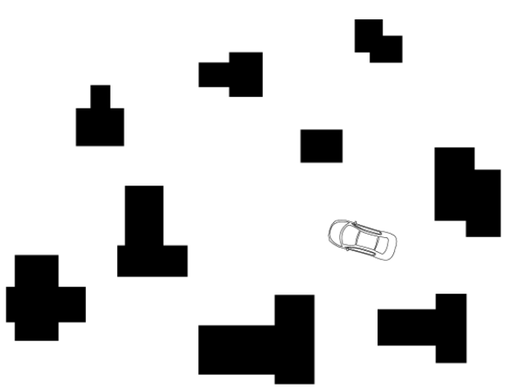
We grow up in the world full of shapes and forms, we have evolved to notice and acknowledge shapes, prefer certain forms over others. "Neuroscientists studying our responses to specific objects and shapes design experiments for subjects to view things in milliseconds. In those brief moments our brain can subconsciously determine whether or not to flee or step forward well before our conscious mind gets into the act." Ann Sussman

Royal Ontario Museum in Toronto built in 1914, expanded its premises in 2007. The new extension is designed by deconstructivist artist Daniel Libeskind, the more recent addition, named the "Lee-Chin Crystal" has steel and glass façade enclosing large acute volumes within. The sharp bends and angles as seen from the outside can be experienced from the inside as well. The lack of balance in the shapes with pointy forms with sharp edges is vertigo-inducing and can make one feel disoriented. In 2009, the building was voted eight amongst the other ugliest buildings in the world. (virtual-tourist.com)

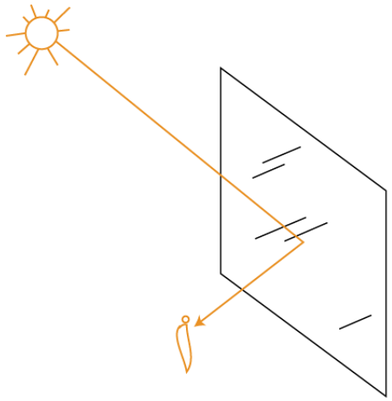
Even with the merits of the theatrical yet useful extensive interior spaces, with impressive galleries and museum's proud collection of dinosaur skeletons, many useful features of this buildings are often ignored by the critics and they never fall short of noticing oddities. The reasons behind the irrational hatred towards jagged edges has to do with our primal behaviours that was passed from generation to generation from early primates. We regard jagged, sharp and hard edges as repulsive, signalling risk. And we often prefer smooth curves and contours, ranging from shapes, typography, architecture or landscape. Acute angles, and sharp corners may induce emotions of anger in anxiety and response to danger.

"An international team of researchers from Humboldt University in Berlin and the University of Haifa conducted an experiment on social judgement in which participants were asked to assemble a portrait of a stranger from puzzle pieces that had either rounded or jagged edges, Participants judged those faced constructed from jagged edges to be colder and more aggressive than those constructed from rounded edges. In a telling follow-up study, participants were asked to participate in a common game of economic decision-making, where they could choose to act either cooperatively to share winnings with a partner or aggressively and take all of the spoils for themselves. Participants played games in different rooms, each decorated with a collage of abstract shapes in the walls: one room sporting sharp, angular shapes while the other room displayed shaped with curves. Participants were significantly more likely to behave aggressively when they were surrounded by art with shapes angled shapes that when they were surrounded by art with sharp angled shapes than when they were in the rooms where more rounded contoured art was hung. Collectively, these experiments suggest that the shapes of contours that surround us can make us feel either happy & comfortable, outrage us in anger in response to creeping danger" (Ellard.C., 2015).

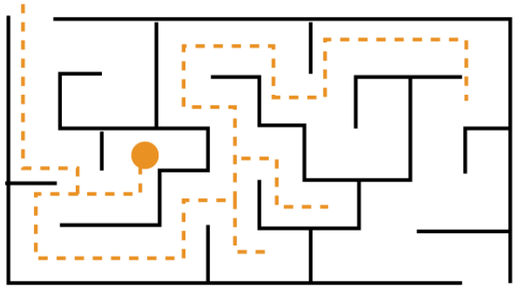
Examples of Annoyance → Anger → Rage



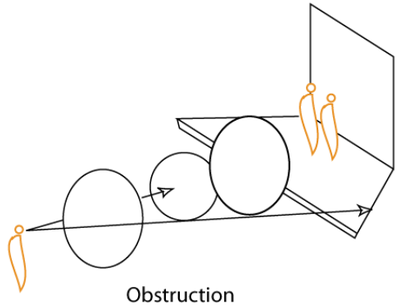
Unstructured city plans



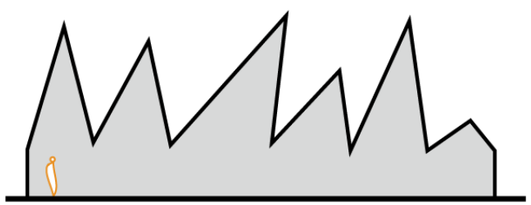
Blinding reflection or glare



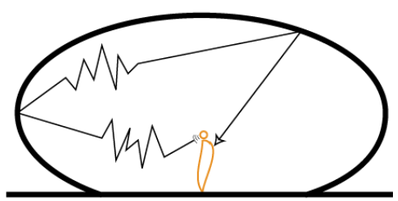
Maze with no signage



Obstruction



Unharmonious



Deafening undesirable echo

Fig. 30: Conceptual Sketch showing spatial configuration that can induce Annoyance, escalate to Anger and Rage (Author's work)

Interests → Anticipation → Vigilance:

Vigilance is described as focused attention or watchfulness. Vigilance is one of the essential emotion from evolutionary standpoint for survival, by being aware of the possibility of threat to safeguard oneself. Early man discovered cave to hide at the same time keep a watchful eye on the threat from a distance. German ethologist Niko Tinbergen made an argument that the crucial element in habitat selection for an animal was "to see and not be seen", either from the view point of the hunter or the hundred. The advantages of being able to know what is in the neighborhood while escaping detection of oneself is clear. Furthering this concept by Tinbergen, Jay Appleton an American geographer proposed the concept of Prospect and Refuge, might help to account for our aesthetic preferences for particular kinds of natural landscapes. Human beings still respond to faint echoes of our natural impulses even though we are not likely to encounter a threat from a carnivore or a dangerous predator. Frank Lloyd Wright's intuitive residential designs are brilliant examples to understand the role of geometry to focus attention at the same time blending the geometries with nature played important role in staging prospect and refuge theory to shape comfortable living conditions. (Hildebrand G., 1991)

Thigmotaxis

This understanding can also be studies by building an understanding for the concept called Thigmotaxis, which is an ancient greek word, thigma meaning to touch and taxis meaning arrangement, has come to mean the direction of movement in response to outside stimulus or more simply "wall hugging" (Sussman A., et al, 2015)

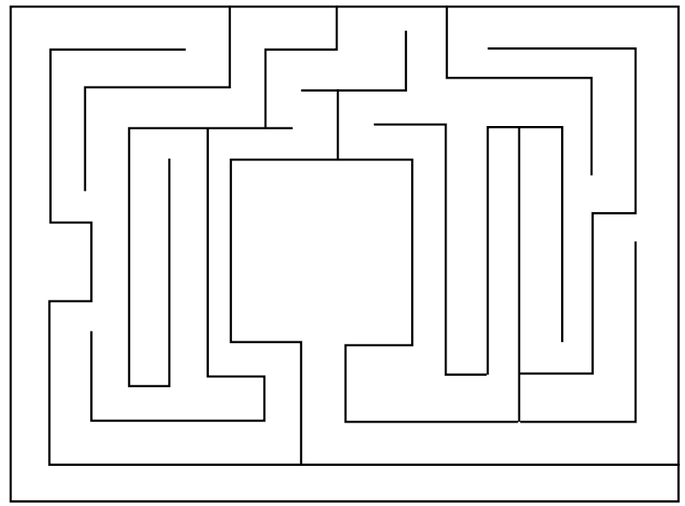


Fig. 31: This figure shows a representation of the First maze for Laboratory animal testing that was modeled after a human on designed for entertaining English royals; later versions were used in laboratories to study animal and human thigmotaxis (Own sketch to represent maze extracted from Sussman, A., & Hollander, J. B. (2015))

Fear.. triggers a specific exploratory strategy such as thigmotaxis as a response to safeguard oneself from the possible threat, it also plays and important role in spatial learning. The use of thigmotaxis helps the individual define the borders of an enclosed space and identify escape routes from that space and identify escape routes from that space. Thigmotaxis also provides the individual with the elements of an egocentric from of reference…With the elements of that from of reference in hand, the organism can begin to construct a cognitive map. (Kallai et al. 2007)

This not only helps one build preparatory strategy to plan escape routes but also be watchful and aware of the surrounding while gathering data to locate oneself in a specific place and from that 'home base' go to construct mental 'map' of the surroundings. It also helps one define borders of space through visual scanning to reframe it, especially in novel environments. (Sussman A., et al, 2015)

Understanding of Thigmotaxis can not only help one plan public spaces to create pleasant and less threatening experiences but also by finding a right balance one can use this theory to design spaces where one feels fully aware, enjoying the present. Thigmotaxis can help plan to avoid anxiety of the future events and unnecessary worries and fears of non-existent imaginary threats through careful design. This can also remind one of connections to concept of Feng Shui which discusses similar principles of space-making that responds to user-centred emotional needs.

Civilizing attention

"My experience is what I agree to attend to. Only those items which I notice shape my mind."

–William James

Attention is our ability to focus so as to understand, William James famously exclaimed that our mind is shaped by our experiences and our experiences are directly related to our attention. Our ability to pay attention is useful to cut the noise and take in only refined version of necessary information that we think is important. In doing so, we chose and edit information which is guided by our perception of rights and wrongs, relevant and irrelevant, sometimes it's good as we are able to pattern and code information in our head. But sometimes this practise becomes a barrier to letting new information filter in to our knowledge bank. Recent studies have replaced the orthodox idea of attention that – we sense what we sense simply because that's what's there- with the idea that human perceivers are active observers who construct a sensible interpretation of whatever their sense organs might be telling them. "Human beings willfully brought together the world into being by deliberately drawing together the facts of sensation into a coherent story- often doing this by focusing on some aspects of their senses and ignoring others- put simply by paying attention.

Changes in our economics during the industrial revolution and mass production dictated a lot of developments in our understanding about the world. The industrial revolution did not only revolutionize our economy but also commoditized our ability to pay attention. When the workers in factories were in high demands they were needed to focus on their jobs and the environments designed around them along with the culture made sure the demands were met. Thomas Edison's invention, the light bulb was a real genius invention of all times. It lit up our world, it commoditized light and the option to have light even in darkest hours and doubled the speed of innovation. We were now able to attend to things not only in day light but in the dark nights. "Long before Marshall McLuhan's proposed understanding of the power of media to shape our thoughts, Edison's invention of the Kinetoscope, a forerunner of modern motion picture technology along with his contributions to other kinds of communication technology such as the stock ticker, revealed the early development of an understanding of how the presentation of text and image could be used to shape our willful acts of attention. By harnessing the power of such technologies to capture thoughts, influence life narratives, and create strong appetites for consumption, Edison contributed to the beginnings of a

trend whose effects have accelerated wildly for the past two centuries. In this day and age, we all realise the importance of spending time in Nature, and that time spent in natural environments is good for our mind as it keeps it active. We still prefer to place the highest premium of all our abilities to maintain task-oriented laser beam focus on activities that will contribute to our productivity. We treat nature as a time away from "real-life". Since our early childhood years we spent time in classrooms focusing our attention to classroom activities, where the walls of our classroom acts as buffers to cut off our minds to wander in nature but to focus on one single activity dictated on the blackboard. One can observe that we have moved away from our natural tendency of keeping our mind occupied in natural environments full of pattern, to systematically moving towards sharply focused attention that help us fulfil our desires while leaving us mentally depleted. (Ellard.C., 2015)

Examples of Interests → Anticipation → Vigilance:

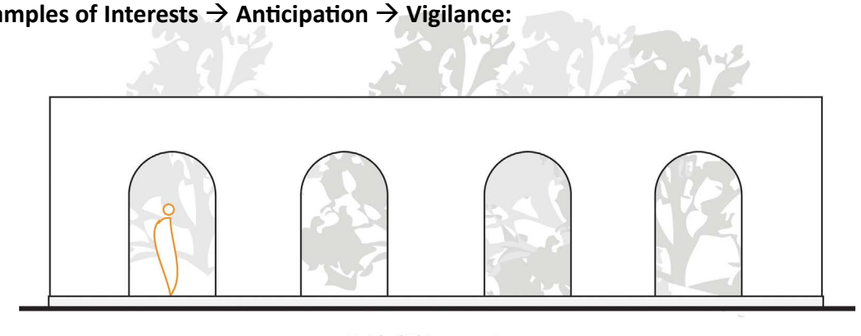


Fig. 32: Conceptual Sketch showing spatial configuration that excite Interest or Anticipation or Vigilance (Author's work)

Serenity → Joy → Ecstasy

We go to Entertainment centres, shopping malls and casino's to get entertained at the cost of some time and money. In a way these spaces are designed with an aim to inject us with artificial pleasure for the exchange of some money. These spaces are designed to maximize profit, maximum interface with public through transparent glass façades, inviting us in with the flashy displays of attractive props, warm soothing lighting in which everything looks pretty. How often have we walked into a shopping mall wanting to buy only a pair of pants but then ended up buying an unnecessary pair of shoes to sit in the shoe-rack for rest of its life-time, or a fancy looking dress for an occasion which was so unimportant that it lay missing from the calendar, and a completely useless piece of jewellery which will never be worn. We come back home avoiding our phone, which is not used to our alien behaviour, beeping for our attention to see a message from the bank showing our freshly bruised bank-balance. We walk into a showroom in hope for a better deal to save some money but we end up spending more than what we initially assign a budget for. Shopping as an activity has its roots in ancient culture, where we used to exchange material goods for those essential to our needs. Markets in ancient civilizations where important hubs for exchange of goods, and also a space that was designed to allow for social interactions. Market places contributed to the social capital of the ancient cities. But consumerism today has changed the way these places operate, from places of social exchange to places for monetary exchange to promote and sustain consumerism. Consumerism in many ways promoted the culture of competition, where everyone is competing for our attention, while teasing our emotions, luring us and our desires for shiny things. The reflective surfaces with yellow light making us just as pretty like we do in pictures when edited with an Instagram filter. The intention of the mood lighting and reflective shiny surfaces is not only to make the products look good but it also accentuate our appearance. So that when we try them on, we compliment the appearance of the product and the product in turn returns the favour. This is a "fool proof" method to convince most of us into falling for that very 'picture-perfect' moment, and taking along the product back home, to feel exactly how we felt, when we were at the shopping mall trying the product on for the first time.

Academic research has shown that people are more likely to succumb into purchasing when they are in a positive emotional state. (Silvera D., et al, 2008) In very large theme parked like shopping malls such as Canada's famous Edmonton Mall, shoppers are aroused by the complex and incongruous juxtaposition of both displays of merchandise and grand facsimiles of famous locations like Bourbon Street in New Orleans, and spectacles such as full sized roller coasters, live penguins, and working submarines. Almost luring people by making them a part of a grand narrative. People are enticed to imagine themselves wearing expensive clothes and jewelry (Ellard C., 2015). Behaviour economics have studied our impulsive behaviours for years and they have found that we tend to fall for small immediate rewards as against larger rewards for which one may be asked to wait. "As if the tools of basic environmental design were not enough to stack the odds in favor of impulse purchases, the advent of new kinds of technologies for more careful probing of the shopper's internal states and preferences have provided some new opportunities for marketers to peer inside the minds of consumers." Collin Ellard.

Lust plays an important role not only to make us buy the essential commodities we were looking to purchase, but most shops make money from the purchases that are unintentional mostly guided by our impulse to purchase. This is where the design of spaces, positioning and placement of displays, lighting, decoration, and setting of the environment plays an important role to paint a pretty picture which almost hypnotise us into spending more to own more than we usually intend to. With the advent of technology, we can digitally track our behaviours and aggregate to understand patterns, and derive decisions on our likes and dislike, commonalities in our reactions and responses and enhance our understanding to exploit or use the knowledge to our advantage. Our choices and our behaviours will continue to populate our digital databank to further enhance and model our environment to conquer and invade our inner most states.

Examples of Serenity → Joy → Ecstasy

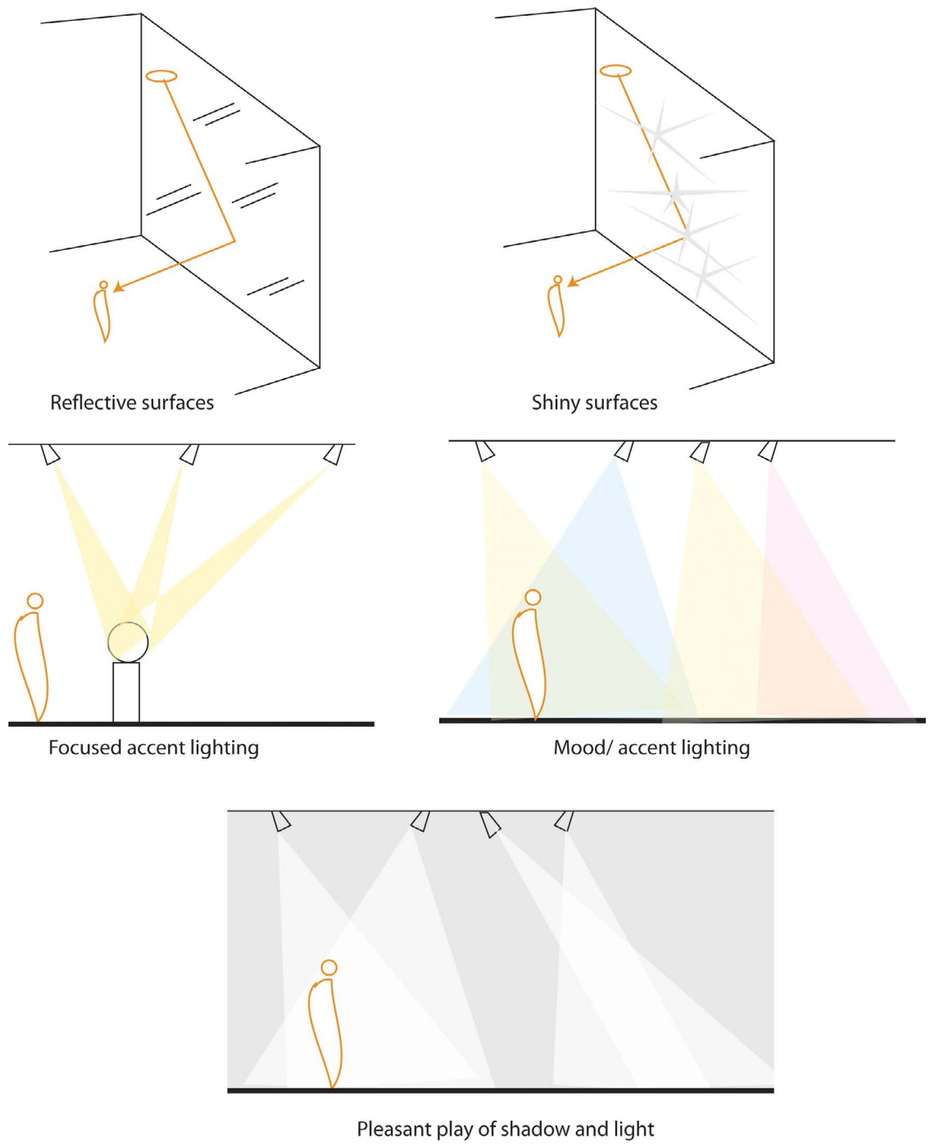


Fig. 33: Conceptual Sketch showing spatial configuration that may instigate feelings of Serenity, Joy or Ecstasy (Author's work)

Acceptance → Trust → Admiration

Information theory is a branch of applied mathematics, a powerful set of ideas from the Bell Telephone Company in 1940s, to help understand the transmission of signals through wires. Information theory was applied in this context to describe the principals involved in communication under conditions of uncertainty, such as might happen when a signal is being sent through a wire is partially degraded so that only parts of the message remain intact. The unit of information was defined as the bit, and just like computer bits, a bit of information could range in value from zero, containing no information to one, bring filled with information. One can use this theory to quantify the amount of information that is contained in a message in terms of bits. One of the keys to the theory is that to quantify information, one must be able to estimate the probability of occurrence of individual elements in the message. Elements that don't appear frequently provide more information than the ones that appear often. Adding this up one can arrive at a number in bits that can describe in bare formalities the information content of the message.

Consider an example, of an online call you may have had with your friend and due to bad internet connection you only are able to hear half of the sentences being uttered. If the message you hear is "…..in…..of… to….and….me…" then you would learn very little about what was being said as it had very little that was new. The bit value of the utterance would be close to zero. Whereas on the other hand, if it you heard "They….cab…their way…home…" one could probably understand the crux of the conversation at least part of the meaning. Information theory suggests both utterances contains same number of words. The difference is that the first message contains only words that appear with very high frequency in English, they carry very few bits of information. The second message on the other hand contains very low frequencies and low probabilities of occurrence and hence more information available. According to Berlyne, we could use his theory to understand any kind of object that we can perceive including visual displays pictures, three dimensional objects. It gives us generally applicable method for measuring how much old or novel information does a scene contains. (Berlyne D., 1957). **Admiration or novelty is experienced when a space is information rich helping us create new knowledge, allowing us to make new connections engaging our cognition**.

For example Kensington Market in Toronto is a great example of a place for admiration experienced by most people who visit the city. The street is lined up with a number of restaurant serving cuisines from all over the world. Each restaurant or a shop has a uniqueness to it, representing the culture of the country the food served in the restaurant belongs to both exterior and the vision of the interiors from the street makes the whole atmosphere extremely exciting and novel. Walking through the street, once can experience that all their senses are busy analysing the feelings, the aroma of food from across the globe with colorful imagery on the façade of each restaurant keeping your eyes pleasantly occupied. The live music by buskers being remixed by those from the multicultural shops selling souvenir from across the world, adds to the ambience while creating an interestingly pleasant experience altogether. Kensington market is therefore a perfect example to study information theory and its application while designing streets to engage the pedestrians to captivate their attention to induce emotional state of admiration.

Framework 01, is the summary of all the concepts discussed in this section, indicating possible emotional responses to a given design. This framework is only suggestive. Although since emotions are subjective and can be a result of various other reasons, this framework can only serve as a guide to understand possible responses if not definite emotional responses. In Part 4, I will refer to a methodology to design and superimpose narratives which can further help us manipulate and refine experience of spaces.

Examples of Acceptance → Trust → Admiration

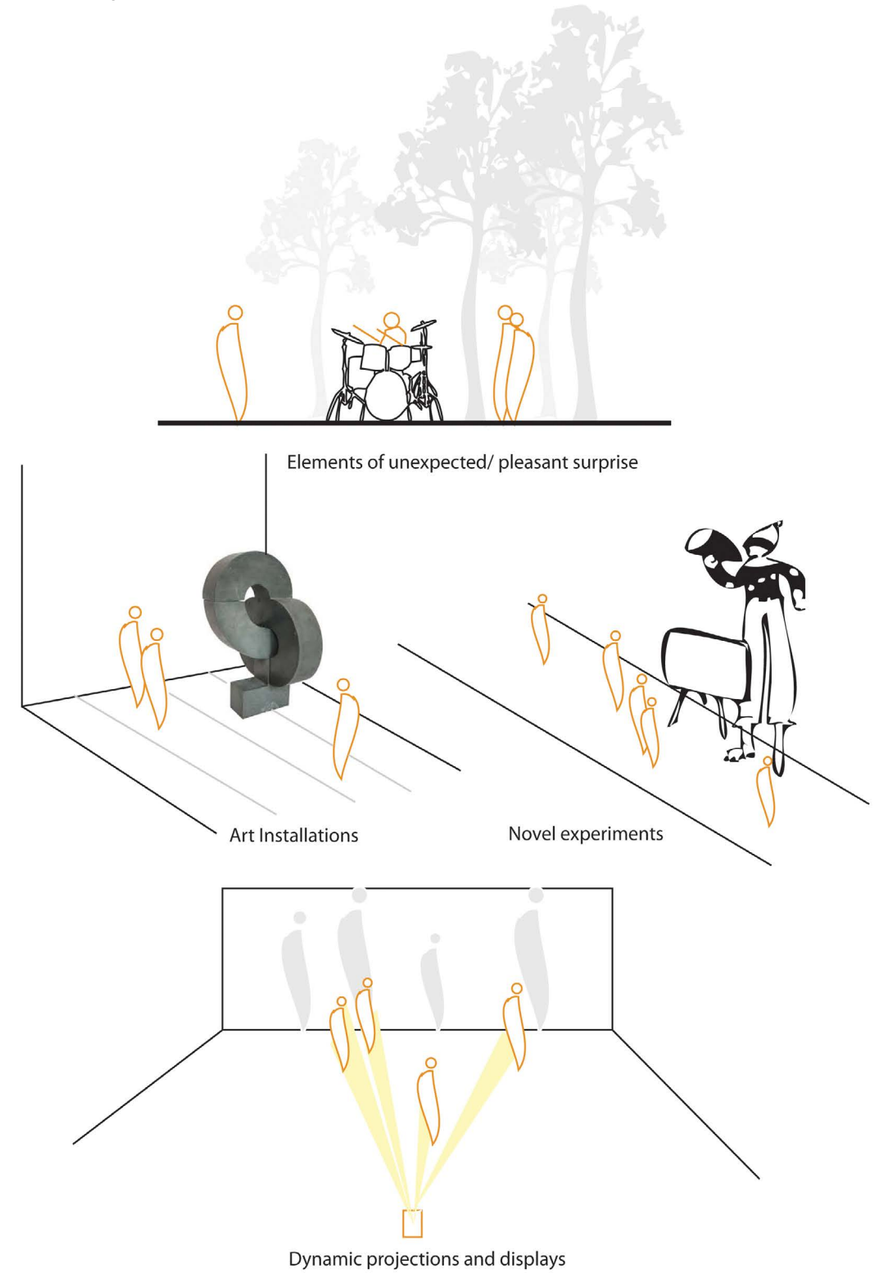


Fig. 34: Conceptual Sketches showing spatial configuration that can promote Acceptance, Trust and Admiration in a given space. (Author's work)

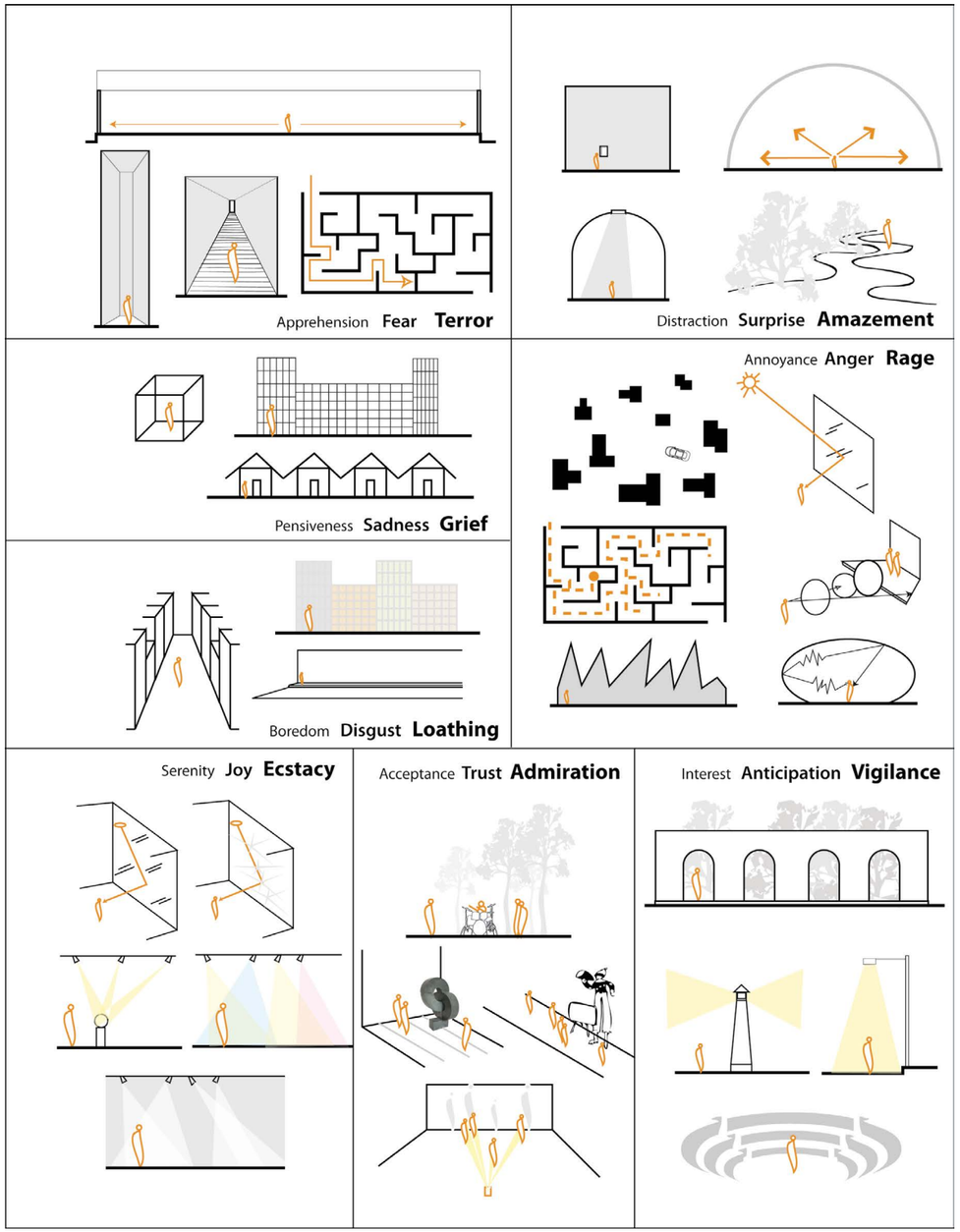


Fig. 35: Framework 01- Spatial Configurations and associated emotional responses (Author's work)

Part 4

Experience = Space + Story (Narratives)

Superimposing Narratives

Art directors from theater industry or film have always had a script to make people go through a series of experiences. Once the designers have identified a storyline, they can move to staging the experience proposed in the narrative. In The Viewpoints Book, Anne Bogart and Tina Landau, Art directors for theatre industry share a methodology for staging experiences in theatre or plays. Their methodology is precise and universal in terms of its application to other fields. The methodology is that of 'Viewpoints' and 'Composition', they argue that these concepts are timeless and belong to the natural principles of movement through time and space. This concept is simply an articulation of a set of names for things that already exist, things that we do naturally and have always done, with greater or lesser degrees of consciousness and emphasis.

The theatre plays outline the experience through a **script or a narrative**, this narrative forms the basis of a plot of the experiences the creators want people to experience and feel. This experience could belong to any time of in history either real or imaginary, they stage this experience based on the narrative. This narrative is a storyline which work as a guiding metaphor to the essence that the art-directors are trying to convey, which they do by taking people through a journey of emotions. For example, the storyline could invoke happiness, sadness, melancholy or even boredom. The script of the play basically responds to the persistent need of us humans to make sense of our place in the universe and therefore through stories we look for ideas and concepts that can inspire us or help us in our day to day decisions. This inherent need is expressed in the poem 'Things' by Lisel Mueller (b. 1924) a Pulitzer Prize winning American poet. In this poem, she shows how we assign words that relate to our bodies to objects that surround us and enable the narration of stories to help us frame our experience. (Sussman A. et.al, 2015)

Things

By Lisel Mueller

What happened is, we grew lonely

Living among the things,

So we gave the clock a face,

The chair a back,

The table four stout legs

Which will never suffer fatigue.

We fitter our shoes with tongues

As smooth as our own

And hung tongues inside bells

So we could listen

To their emotional language,

And because we loved graceful profiles

The pitcher received a lip,

The bottle a long, slender neck.

Even what was beyond us

Was recast in our image,

We gave the country a heart

The storm an eye

The cave a mouth

So we could pass into safety.

In Cognitive Architecture, Author Ann Sussman and Justin B. Hollander further underline our inherent need for narratives. According to them we "anthropomorphize 'things' in our worlds to make sense of it, we similarly look for our buildings and our urban places to reflect us and satisfy needs including our singular and voracious narrative appetite."

Fig. 36: The Pegasus Fountain at the entry to the sixteen-century Villa Lante in Bagnaia, central Italy, represents Biblical paradise a time before man's fall from grace where there was natural abundance on earth (Image Source: Wikimedia Commons)

Fig. 37: The 'garden finale' at Villa Lante, suggests a new of hope dawning after 'the fall,' where man's creativity and knowledge can be put to use offering hope and salvation (Image Source: Wikimedia Commons)

"We came to see that the search for attachment to a person, an object, a work of art, an idea- held open the possibility of feeling not alone…of knowing the meaning of expansive connection between self and world" Key Young (2010), Imagining minds.

Just as our brains are wired to favor symmetry, look for order in complexities, we seek narratives and stories to help us make sense of the events. How we see our world around us is how we also see ourselves in it, we build relationship with the world through the stories we tell ourselves. "Narrative is unusual ability of the mind to create stories and in the process find multiple ways of linking to the environment and securing a place in it. In "The Neurology of Narrative (2001), Kay Young, PhD and Jeffery Saver, MD, Professors of English and neurology at University of California, Santa Barbara, describe narrative as " the inescapable frame of human existence". They studied how diverse thinkers over two thousand years from Aristotle to Barthes, have deduced the centrality of narrative to human cognition without actually knowing the biology or neuroscience behind it." (Sussman A. et.al, 2015).

Having an understanding of the fact that human brain looks to make connections and assisting them build it meaningfully with a consciously designing surroundings to compliment the process, can enhance the experience in any given space making it worthwhile for the users of the space.

Viewpoints

Viewpoints is a philosophy discussed originally to serve as a technique for training performers; building ensemble in Theatre industry but the application of these concept can go beyond the sphere of Play writing and Art-direction to Design and Architecture of spaces or anyone who is working to stage movements for any event. In this section, I have adopted their theory and re-narrated its elements to create a better understanding of its application to staging an experience in a public space. Having a thorough understanding of the principles can be useful to further extrapolate it's application to any faculty of work that has to do with staging an experience.

According to Anne Bogart and Tina Landau:

1. 'Viewpoints' is a set of names given to certain principles of movement through time and space; these names constitute a language for talking about what happens in an event space (Bogart, A., et.al, 2005).

2. Viewpoints are points of awareness that a performer or creator can make use of while working with an event space (Bogart, A., et.al, 2005).

According to this theory, we work with nine Physical Viewpoints, mostly within Viewpoints of Time and Viewpoints of Space. Viewpoints of Sound, which was developed later are specifically related to sound as opposed to movement. Physical and Viewpoints of Sound overlap each other and constantly change in relative value, depending the style of the production.

The Physical Viewpoints are discussed below:

Viewpoints of Time

Tempo: The rate of speed at which a movement occurs; the tempo defined how fast or slow something happens. This can affect the syncing of heartbeats and hence the experience of the event.

Duration: How long a movement or sequence of movements continues? Duration, in terms of Viewpoints work, specifically relates to how long a group of people engaged in an experience stay inside a certain section of movement before it changes. The duration of an event can affect an experience, and hence the design choices. For example, In case of a temporary event, if it is an outdoor event, planned for a sunny morning, the response of the audience for a short duration of exposure to sun

in open public space will be different than for longer duration from morning till evening, and having an understanding of the response can help a designer make right kind of design choices. The same can apply to permanent event space.

Kinesthetic response: "A spontaneous reaction to motion which occurs in an event space; the timing in which people respond to the external events of movement or sound; the impulsive movement that occurs from a stimulation of the senses. An example: someone claps in front of your eyes and you blink in response; or someone slams a door and you impulsively stand up from your chair, if there is a fire alarm, people run to look for an escape" (Bogart A., et.al. 2005).

Repetition: The repeating of something at an event space includes:

(1) *Internal Repetition* (staging a repetition of a movement within the bodies of the subjects);

For example, a repeated association sign or a symbol gives a coherent understanding of a space. So a stop sign or a red light will inform people to stop beyond the line which has the sign installed.

(2) *External Repetition* (repeating the shape, tempo, gesture, etc., of something outside your own body). For example, Steps are designed to facilitate a repetition of a movement of climbing in an orderly manner, through maintaining a same measurement for all treads and risers in a staircase.

Viewpoints of Space

Shape: In space all shapes can be broken down into either
(1) *lines*; (2) *curves* (3*) a combination of lines and curves*.

These shapes are either round or angular or shapes that are a mixture of these two. In addition, Shape can either (1) *stationary*; (2) *moving through space*. Lastly, Shape can be made in one of three forms: (1) *the body suspended in a space*; (2) *the body in relationship to architecture making a shape*; (3) *the body in relationship to other bodies making a shape*.

This idea could be easily understood from the example shared and the theory of emotions discussed in the Psychology of Design section. The response to curves as against sharp edges is a pretty neat example of them all.

Gesture: A movement involving a part or parts of the body; Gesture can be understood as a shape with a beginning, middle and end. Gestures can be made with the hands, the arms, the legs, the head, the mouth, the eyes, the feet, the stomach, or any other part or combination of parts that can be isolated. Gesture is broken down into:

(1) *Behavioral- gesture*: "Belongs to the concrete, physical world of human behavior as we observe it in our everyday reality. It is the kind of gesture you see in the supermarket or on the subway: scratching, pointing, waving, sniffing, bowing, saluting. A Behavioral Gesture can give information about character, time period, physical health, circumstance, weather, clothes, etc. It is usually defined by a person's character or the time and place in which they live. It can also have a thought or intention behind it. A Behavioral Gesture can be further broken down and worked on in terms of Private Gesture and Public Gesture, distinguishing between actions performed in solitude and those performed with awareness of or proximity to others" (Bogart A., et.al. 2005).

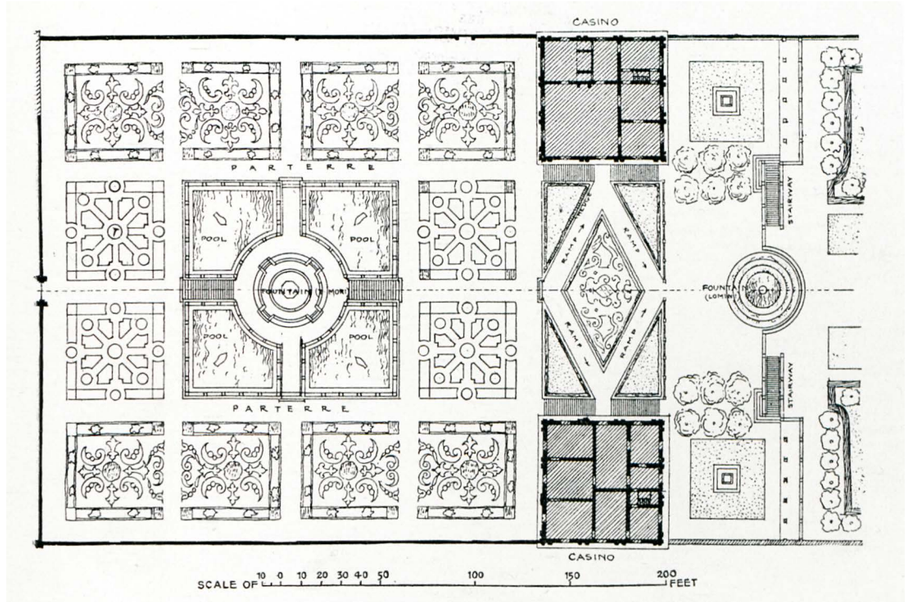


Fig. 38: The plan of Villa Lante; the principal entry to the garden starts at the top (or south) in the diagram and follows a linear progression down a grade to the exit at the north. The garden sequencing tells the story of man's biblical fall from grace and re-emergence into a world of rationality and hope, represented by a grand fountain centered in a large square of symmetrically arranged plantings at its base (Image Source: Wikimedia Commons)

(2) *Expressive gesture*: "Expresses an inner state, an emotion, a desire, an idea or a value. It is abstract and symbolic rather than representational. It is universal and timeless and is not something you would normally see someone do in the supermarket or subway. For instance, an Expressive Gesture might be expressive of, or stand for, such emotions as "joy' "grief" or "anger." Or you might create and work with Expressive Gestures of or for "time," or "memory" (Bogart A., et.al. 2005). For example, an event design to commemorate a past tragic event versus an event to celebrate a victorious moment from the past will have different expressions.

Architecture: "The physical environment in which you are working and how awareness of it affects movement. How many times have we seen productions where there is a lavish, intricate set covering the stage and yet the actors remain down center, hardly exploring or using the surrounding architecture? In working on Architecture as a Viewpoint, we learn to dance with the space, to be in dialogue with a room, to let movement (especially Shape and Gesture) evolve out of our surroundings" (Bogart A., et.al. 2005).

Architecture as proposed in the Viewpoints book can be broken down into:

(1) *Solid mass*: Walls, floors, ceilings, furniture, windows, doors, etc.

(2) *Texture*: Whether the solid mass is wood or metal or fabric will change the kind of movement we create in relationship to it.

(3) *Light*: The sources of light in the room, the shadows we make in relationship to these sources, etc. about the size and shape of the space we work in. For example, we might choose to work in a narrow three-foot strip all the way downstage or in a giant triangular shape that covers the whole floor, etc.

(4) *Color*: Color of the space or even the lighting can dramatically affect the experience of an event. The human responses to colors have been studied in detail and proposed by Robert Plutchik in 1958 via wheel of emotions with a set of primary and complimentary emotions, associating each emotion with colors on the color wheel, furthering the idea offered by William McDougall who first noted the parallel between emotions and colors in 1921 which is discussed in detail in the Psychology of Design section of this research report.

Viewpoint of Sound:

The author Anna Bogart and Tina Landau argue, that Viewpoints of Sound or Vocal viewpoints addresses sound in the same way that the Physical Viewpoints addresses movement, i.e.,. by increasing an awareness of pure sound separate from psychological or linguistic meaning. Rather than hearing only what a certain word connotes, we start to address how it sounds and how the sound itself contains information and expressivity. Viewpoints of sounds highlights the limitations of vocal or sound range and subsequently encourages more radical and dynamic sound choices. Viewpoints of sound generate an adventurous attitude to the sound's potential through freedom, control and responsiveness. Changing sound in a given environment can alter meaning and impact.

For example, if the event being planned is a rock concert, one can expect a performance, along with the crowd that may attend to enjoy a given performance, once a designer thinks of the kind of sound the environment will be responsible for in a given event, and the possible reaction to the sounds, the knowledge of this can assist the possible arrangements to manage the event.

The Viewpoints of the Sound are slightly different than the Physical Viewpoints. When working on the Vocal Viewpoints, there is an option to choose from: Tempo, Duration, Repetition, Kinesthetic Response, Shape, Gesture, Architecture, Pitch, Dynamic, Acceleration/Deceleration, Timbre and Silence. The only direction suggested by the authors of the theory is that these Viewpoints should be introduced one at a time. As they believe developing each of them individually will lead to a remarkable awareness of the potential of the sound as a design element, for both the performer and the listener.

Although these can be studied in terms of solo and group events or for a situation where one intend to curate a dialogue, I have tried to describe each of these elements in a generic language to give an understanding of the interplay between the sound and the actors in any given experience. The Viewpoints Book takes a detail dive into the subject and explains each of the above discussed elements with an exercise and hence it can serve as a great source of reference for anyone interested to understand the application of the theory in depth.

1. **Pitch :**Pitch is the level of a sound in the scale, defined by its frequency. As with singing or playing a musical instrument, Pitch is where a sound lies within the possible range of the instrument. In Viewpoints of sound a choice is made about where a note is placed in the sound range, from low to high or high to low. How wide is the pitch range? How flexible and responsive is the sound in the environments to its people? (Bogart A., et.al., 2005). Thereafter, the choice of pitch at any given moment is always a response to the pitch of the moment being planned at the event space. So a high pitch sound will aggravate the intensity of response whether positive or negative. A screeching sound can irritate while a soothing pitch with a balanced rhythm can be a pleasing experience.

2. **Dynamic :** “In Viewpoints of Sounds, Dynamic is volume, or the loudness of any given sound. Dynamic is an expression of the degree of aggression or attack by the performer. Notice how a simple change in Dynamic can radically change the meaning of a moment or interaction. Again, the choice of dynamic should emerge in response to the dynamics being offered in an experience” (Bogart A., et.al., 2005). To give a very simple example, choice of music in a given event, a wedding versus a patriotic event.

3. **Tempo:** As in Physical Viewpoints, Tempo is speed. In the case of Vocal Viewpoints, Tempo is the speed with which the words or sounds are expressed. Attention to tempo variation and responsiveness to the tempo of the people in the given environment. One responds to the other’s tempo with a choice of tempo. Noticing how Tempo can alter the meaning of the dialogue between the people and their surroundings, and the feel of the relationship expressed in the dialogue can help staging a dialogue with a sense of awareness and intentionality (Bogart A., et.al., 2005).

4. **Acceleration/deceleration:** Accelerating the speed of the dialogue by starting slow and growing faster, maintaining an acceleration, never leveling can have exactly opposite experience than deceleration—by starting fast, and together collaborating on bringing the speed slower toward the end of the dialogue. Acceleration and deceleration can alter the meaning of dialogue as well as our perception of relationship; further altering the experience of the event.

5. **Repetition:** With an acute sensitivity to repetition, people respond to the dynamic or tempo through repetition. Musicians use Repetition to create melodies, Repetition of a particular sound in a surrounding can affect how people communicate or behave with one another in a surrounding. For example, the slogans people recite in a public rally, can aggravate or relax a behavior.

Composition

Composition is a methodology for creating new work. It is the practice of selecting and arranging the separate components of theatrical language into a cohesive work of art for the event space. It is the same technique that any choreographer, painter, writer, composer or filmmaker uses in their corresponding disciplines (Bogart A., et.al., 2005). In designing experiences it’s this juxtaposition of various elements together that can affect the experience or behavior in response to the composition.

Compositions can translate an overall intention or structure of an experience to using elements such as symmetry, asymmetry, use of scale and perspective, juxtaposition, etc. or specifications such as objects, textures, colors, sounds, actions, etc. These ingredients are to a Composition what single words are to a para-graph or essay. The creator makes meaning through their arrangement (Bogart A., et.al., 2005). In applying Compositional principles from other disciplines such as music, arts, dance, etc., to the experience design in an event space, we push the envelope of possibility and challenge ourselves to create new forms.

To summarize the understanding of Narratives, and its relationship with Viewpoints and Composition theory, I propose the following Framework 02 to assist in superimposing narratives in any given site. One can use this supporting framework along with the framework for Heterotopia, proposed in Part 6 of this report.

Example of Superimposing Narrative in an urban space

Fig. 39:“Body Movies” by Rafael Lozano Hemmer, Rotterdam, Netherlands, 2001 (Image Source: http://www.lozano-hemmer.com/voice_tunnel.php)

“Body Movies” is a project by Rafael Lozano Hemmer, where he transformed a public space with interactive projections measuring between 400 and 1,800 square metres. His team collected thousands of photographic portraits on the streets of Rotterdam, and projected them on a huge blank wall in an open public space. The portraits appear as though they are inside the projected shadows of the passers-by, whose silhouettes can measure between two and twenty-five metres depending on how close or far away they are from the powerful light sources positioned on the ground. A video surveillance tracking system triggered new portraits when all the existing ones have been revealed, inviting the public to occupy new narratives of representation.

“Samuel van Hoogstraten’s engraving “The Shadow Dance” (Rotterdam, 1675) was the main source of inspiration for this work. Body Movies attempts to misuse technologies of the spectacular so they can evoke a sense of intimacy and complicity instead of provoking distance, euphoria, catharsis, obedience or awe.” Rafael Lozano Hemmer

One can notice the elements of Narratives such as Viewpoints of space and time used effectively along with the Composition of projected images and interactive shadows superimposed on a physical space to create an exciting interaction in an urban space.

In the following section of the report, I will speak about the philosphy of Heterotopia, its principles with the help of some examples, which will inform the final framework.

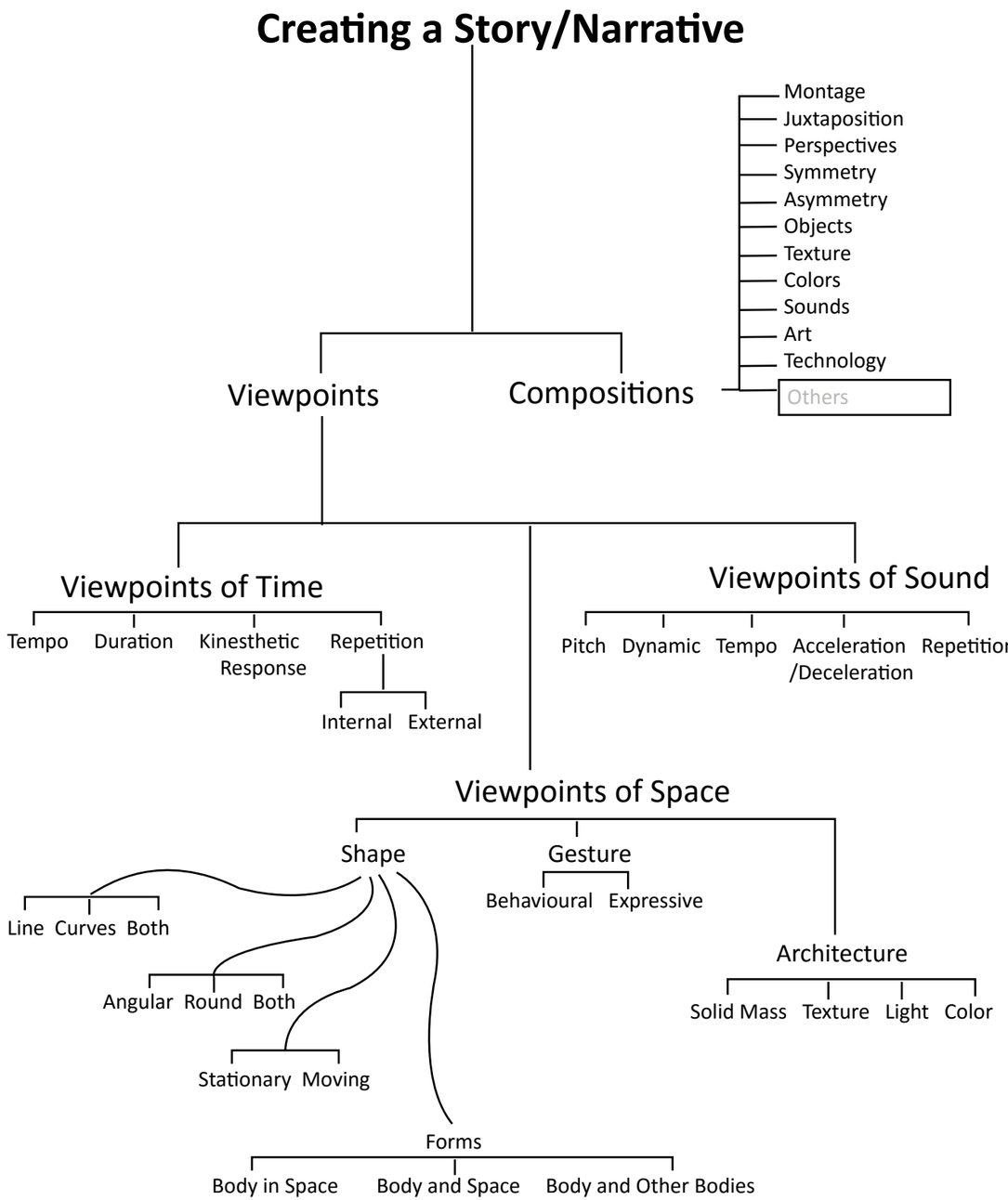


Fig. 40: Framework 02- Elements for Creating a Narrative. (Adaptation from Theory of Viewpoints proposed by Anne Bogart and Tina Landau)

Part 5

Philosophy of Heterotopia

Philosophy of Heterotopia

Our societies are guided by certain sets of norms and rules, a system of understanding which is subtle yet inherent in its structure and making. The system governing our societies may be clearly visible or completely hidden. We understand and comprehend the social system within the limits and boundaries defined by the invisible framework of our societies. Even our spaces are defined and governed by the laws and rules defined by our society. These spaces we find familiar to our understanding of spaces. They are 'normal' spaces. So does it mean all spaces we know are normal? What is a normal space?

In my understanding a space that follows familiar sets of laws and rules which doesn't make us question 'normal' is a normal space. A place that doesn't stand out or fail to appeal to our senses is normal or mundane space. The patterns identified and recognized by the brain in nano-seconds without challenging its comprehension, a space that completely fits in our idea of space with no resistance, so much so that it even disappears or go invisible, completely unnoticed, merges in the background (Poortman J, n.d.).

So does it mean, spaces are supposed to be normal? Are spaces meant to disappear in the background so that we can continue our day to day activity in absolutely 'normal' states without getting attracted to its beauty or say distracted by its mere existence? Do we only need normal spaces to live our lives like normal human beings? Or is it necessary to experience abnormal to understand and value "normal? In his paper of Heterotopia, Jos Poortman challenges our understanding of Normal, he argues that our curiosity and sense of wonder, doesn't let us settle for normal. Our society depends on balance and therefore we know what we notice as normal is a balance between extremities, and hence there is absolutely more to just 'normal'. There can be no ordinary without extraordinary. "Two opposites both questions and criticize each other and thereby explaining, defining each other" If our societies are made of normal spaces which are ordinary, there must be extraordinary spaces which may help us understand and appreciate normal for its systematic order. In this sense then, the extraordinary or the "other space" is as important for any society as the ordinary "normal" spaces.

In March 1967, Michel Foucault delivered a lecture about heterotopia and the manuscript of this lecture, originally titled 'Des Espace Autres', was published by the French journal Architecture Mouvement Continuité in 1984. 'Of other spaces', Foucaults manuscript, examines his findings about spaces which he referred to as 'heterotopias'. Foucault exclaims that '*we are in an epoch of juxtaposition*' and refers to the Middle Ages where "*..there was a hierarchic ensemble of places: sacred places and profane places: protected places and open, exposed places: urban places and rural places" (Foucault, M., 1967)*. He further mentions that our lives are still governed by '*a certain number of oppositions…that we regard as simple givens*' and that the sacred still exist and maintains it hidden presence, harnessing these oppositions(Ibid., p. 115). Foucault tries to point out that the space in which we live happens to be a space that is "*…in itself, a heterogeneous space. In other words, we do not live in a kind of void, inside of which we could place individuals and things. We do not live inside a void that could be colored with diverse shades of light, we live inside a set of relations that delineates sites which are irreducible to one another and absolutely not superimposable to one another*" (Ibid., p. 115-116).

According to Foucault, spaces are heterogeneous with set of relations with objects and entities

within a space, the rules that abides both objects and the space itself. Foucault isn't interested in ordinary spaces but..."all the other sites, but in such a way as to suspect, neutralize, or invent the set of relations that they happen to designate, mirror, or reflect. These spaces as it were, which are linked with all the others, which however contradict all the other sites...' *(Foucault, M., 1967).*

According to his theory there are two types of sites, one that we all call "Utopia" an ideal manifestation of space which is so perfect in its description, that it has to be either unreal or imaginary, and the second type of space is "heterotopia" '*a kind of effectively enacted utopia in which the real sites, all the other real sites that can be found within the culture, are simultaneously represented, contested, and inverted'* (Ibid., p. 116-117).

In my understanding, Utopia or heterotopia are a description of our experience in a given space at a given time. To me our experiences lie at the intersection of space and time, we experience space only when we spend time. Just like spaces can be real or imaginary, so can time be real or imaginary. For example, any fictional story, for instance a Harry Potter novel story, is the story of an imaginary space in an imaginary time. If we were to plot a two by two matrix of space and time, we can better understand the limits and boundaries of both Heterotopia and Utopia.

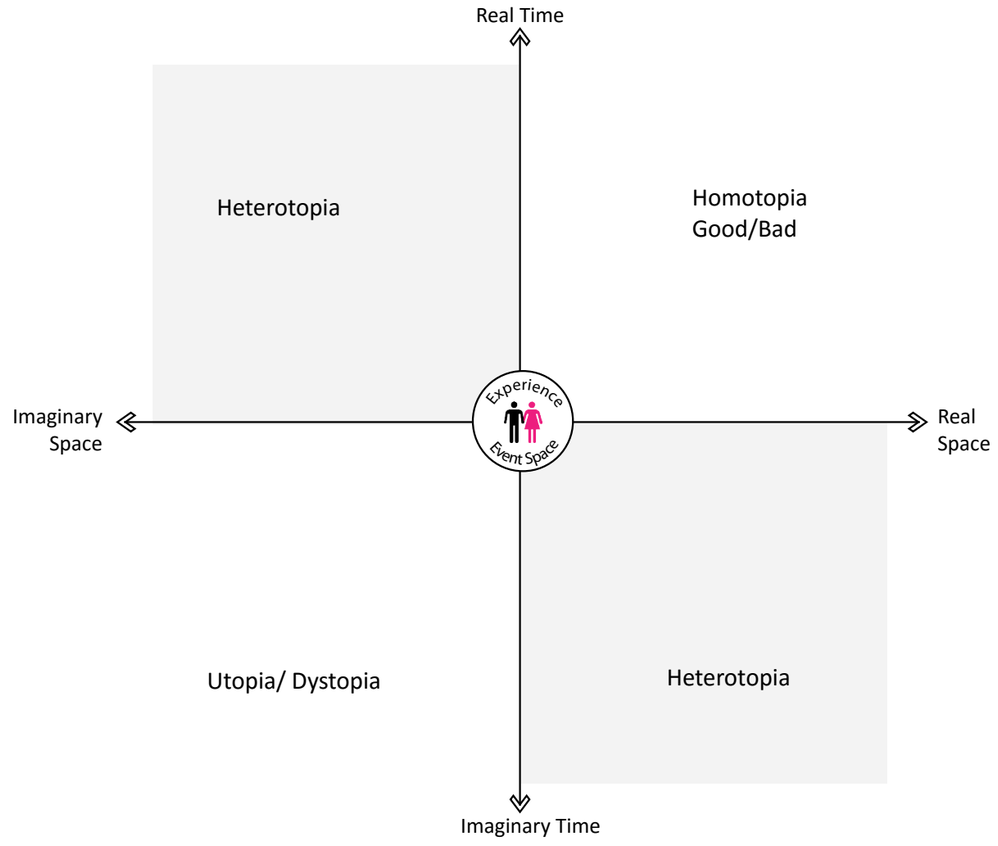


Fig. 41: Space and Time matrix to understand Heterotopia (Author's work)

1) From this diagram we can see when the time is real, and the space is real falling well within the systems of our understanding, fitting all the rules and laws, we experience a 'normal space'. Nothing in it surprise us or astonish us, as it fits well within the framework of our comprehension based on our past experiences, Although it may be a good or a bad experience based on the elements of reality. This space with homogeneity can be referred as "Homotopia" (Michiel Dehaene, in the book 'Heterotopia and the City' describe Homotopia as the space which is homogenous inducing the notion of sameness, and uniformity)

For example: Any physical space which doesn't inspire imagination.

2) When the time is real and the space is imaginary, we may say our experience is real-time, but at the same time the space of our experience is other worldly! As it belongs to an imaginary landscape. This experience therefore is Heterotopic. For example any 'Virtual space' can be quoted to describe this experience.

For example: Cinema, Internet

3) Again in case when both time and space are imaginary, it may be ideal or dystopic, but at the same time it's unreal hence qualifying as Utopia/ Dystopia.

For example: Fantasy, Dream

4) The experience where the space is real, but the time is imaginary, again our experience is real as we are bounded by the space which can be felt as real, but the time is imaginary, for example looking at an art work could be described as an example of such an experience, or a theatre play could be another example. Such experiences will also qualify heterotopia, as they do make us question the edges of our time and compare against the experience of other time horizon in history or from the future.

For example: Theatre, Art Exhibition

Principles of Heterotopia (six)

1) **Idea of a placeless place, with no geographical marker:**

"The first principle is that there is probably not a single culture in the world that fails to constitute heterotopias… But the heterotopias obviously take quite varied forms, and perhaps no one absolutely universal form of heterotopia would be found."

As an example, Foucault refers to the spaces that exist in the form of language like '*elsewhere*' and '*nowhere*', places that describe a crisis suffered by an individual in any culture or time, these '*heterotopias without geographical markers*' were examples of crises heterotopias, privileged, sacred or forbidden places. As another example, he speaks of Mirrors, "T*he mirror is, after all, a utopia, since it is a placeless place. In the mirror, I see myself there where I am not, in an unreal, virtual space that opens up behind the surface… But it is also a heterotopia in so far as the Mirror does exist in reality… From the standpoint of the mirror I discover my absence from the place where I am since I see myself over there… it makes this place that I occupy…at once absolutely real, connected with all the space that surrounds it, and absolutely unreal, since in order to be perceived it has to pass through this virtual point which is over there" (Foucault M., 1967).*

Mirror is quiet an interesting reference to heterotopic spaces, as it is only in mirror that we all experience ourselves in a context around us, in all other times we see through our eyes the world beyond us beside us. The mirror is a great reference to a moment of reflection, which I believe was Foucault's way of emphasizing the importance of reflection aligning to our reflective conscious. A space that ensures we reflect and see things in perspective, the space exist without geographical marker and hence it can be in any space, or age, it can be a part of any culture. In the era before mirror was invented the reflection in water or a shiny piece of metal would have equally served as a heterotopia, in new age of technology, a camera for example which record us in the context can be an example of heterotopia. Medium changes based on the cultural context, but the idea of "reflection" remains the same.

2) ***Timeless space:***

"The second principle of this description of heterotopias is that a society, as its history unfolds, can make an existing heterotopia function in a very different fashion".

Foucault selects the cemetery as an example to explain that it *"…is certainly a place unlike ordinary cultural spaces,* connected with all the sites of the society because each family has relatives in the cemetery but it is also a place that once was *…the sacred and immortal heart of the city…"* and over time, turned into *"…the other city, where each family possesses its dark resting place*" (Ibid, pg 119).

Reading references to cemetery got me wondering, what made Foucault think of a space which is so depressingly honest in its making and conception, that even a thought of it only upsets the mood. We all fear death, we avoid thinking of references that remind us of it. But the reference to Cemetery to my mind is not only to speak of the dead bodies but the uniquely unanimated nature of the space at the same time it forces mind out of context into a different headspace. The stillness and the silence, again a space that puts one outside its usual frame of reference. A visit to cemetery is not a part of normal routines, but a visit to such a space makes almost anyone pause and reflect upon their life path and their individual journeys. One can read through all the examples stated by Michel Foucault and find his subtle direction to point us to include in our conversations, all such spaces which makes one pause and reflect. He tried to underscore the importance of all such spaces which are not new to mankind but certainly sidelined in our modern day discussions of spaces. We may make progress, pace up our lives to beat the speed of light, surround ourselves with technology fighting for our attention, but at the same time Foucault wants us to weave our spaces and environment with elements to allow for reflection as much as they allow for action.

3) ***Juxtaposition of spaces***

"Third principle. The heterotopia is capable of juxtaposing in a single real place several spaces, several sites that are in themselves incompatible"

Foucault refers to theatre, cinema and garden as examples, starting with the theatre which is capable of showing *'…a whole series of places that are foreign to one another...'* continuing with the cinema where *'…on a two-dimensional screen, one sees the projection of a three-dimensional space…'* finishing with gardens as an archaic example of heterotopia, belonging to every era and every culture that exist till today *'that take the form of contradictory sites…the garden is a rug onto which the whole world comes to enact its symbolic perfection, and the rug is a sort of garden that can move across space). The garden is the smallest parcel of the world and then it is the totality of the world.'*

His understanding and explanation of garden as heterotopia was in reference traditional Persian

gardens which comprised four sections representing the four parts of the world. (Knight K, 2014) conceived to symbolize the garden of Eden and the four Zoroastrian elements of sky, earth, water and plants. (WHC, Unesco, n.d.) The reference to Garden of Eden and hence the tree of knowledge is pretty straightforward, to underline the importance and value of spaces that allow for understanding and sharing of knowledge through experience in an immersive environment. Ensuring that we are completely absorbed in present moment learning and growing, such spaces force us to forget our impulse to escapes into oblivious worrisome future or drown in melancholy of the past.

His reference to "garden as a rug" is again a reference to Persian rugs which were often a part of many fictional stories and mythologies as a rug which helped people travel from one place to another while grounding them to a real static space on earth (a garden). The contradiction of movement and static grounding space like a garden which doesn't move is again a common thread across all his examples of heterotopia. Heterotopia is a space that makes us question and experience duality of life. The bizarre contradictions that are incomprehensible yet true. Unavoidable by we still ignore. Foucault doesn't want us to run away from these questions which may threaten our sane understanding of world, but want us to play with its uniqueness and question its structure and meaning.

4) ***Slice in time: Accumulating and fleeting time.***

"Fourth principle. Heterotopias are most often linked to slices in time."

"Foucault again refers to the cemetery is to explain the idea of space where the individual can find both the loss of life and quasi-eternity" (Poortman J, n.d.). He differentiates between heterotopias of indefinitely accumulating time and on the contrary heterotopias linked *"to time in its most flowing, transitory, precarious aspect, to time in the mode of the festival"* (Ibid., p. 120-121). Foucault presents museums and libraries as heterotopias to explain the first type"*…in which time never stops building up and topping its own summit…*, showing *… the will to enclose in one place all times, all epochs, all forms, all tastes…*".The next type is not eternal but are rather absolutely temporal. The fairground or exhibition spaces which are events only staged to be experienced only once or twice a year for a time space of 3 to 4 days.

Where these two types of heterotopia come together "*…the experience is just as much the rediscovery of time, it is as if the entire history of humanity reaching back to its origin were accessible in a sort of immediate knowledge" (Foucault M., 1967).*

"The Burning Man festival", which lasts only a few weeks once a year, people from across the globe, from different ethnicities, religious and cultural background of various age groups gather to create a unique atmosphere to celebrate freedom and human expression through art, with mind-blowing artworks and exhibits belonging to present, reminding of memories from the past and envisioning future. All this is then burnt to dust at the end of the festival. The creators of the artwork burn their artworks down to restore and respect the exclusivity and authenticity of the moment experienced and shared together with the community of art-lovers.

5) **Entry and exit: A beginning and an end**

"*Fifth principle. Heterotopias always presuppose a system of opening and closing that both isolates them and makes them penetrable. In general, the heterotopic site is not freely accessible."*

In general, the heterotopic site is not freely accessible, in saying so Foucault means to preserve the sanctity of the heterotopia as an experience of a space as the one which has an entry and exit. Entry and exit signify a beginning and an end of an experience.' Through examples he tries to clarify

the underlying principles and logics behind his statements. "There are two types within this principle: first the type were entry is compulsory, like in prisons or barracks and second the type where entering individuals have to submit to rights and purifications such as the hammam of the Moslems or Scandinavian saunas. Others seem to be pure and simple openings, but are generally hiding curious exclusions. Foucault gives the example of the famous bedrooms that existed on the great farms of Brazil and elsewhere in South America as explanation. The entry door, meant for uninvited guests, did not lead to the room where the family lived, but to the bedroom where one could overstay the night. *'Everyone can enter into the heterotopic sites, but in fact that is only an illusion - we think we enter where we are, by the very fact that we enter, excluded.'* Another example for this type of heterotopia could perhaps be found in '*the famous American motel rooms where a man goes with his car and his mistress and where illicit sex is both absolutely sheltered and absolutely hidden, kept isolated without however being allowed out in the open'" (Poortman J, n.d).*

The brilliance in Foucault's explanation is in the room it allows for the reader's imagination and interpretations to make the connections and fill in with their own understanding. All his examples to explain this principle reminds me of the quote by Terrance McKenna "Do not give in to astonishment", so to say, however realistic the experience of heterotopia, the sole purpose of heterotopia is to put oneself out of context, to reflect upon the nature of context. Heterotopia is a temporary place, one visits and leave, it has an entry, but an exit to remind our way home, get back to our daily routine with a new understanding and knowledge. Sauna, or a Hammam is again a place where one feels rejuvenated, but one doesn't live in saunas, the space is meant to be visited and exited. A prison on the other hand is a dystopic example of a space, which again points to a type of isolation, which gives one time to reflect upon his life and committed sin peacefully in solitude.

6) **Illusion or compensation realized:**

"Sixth principle. The last trait of heterotopias is that they have a function in relation to all the space that remains".

Jos Poortman in his paper explain this principles as the function that unfolds between two extreme poles: '*Either their role is to create a space of illusion that exposes every real space…' or ', their role is to create a space that is other, another real space, as perfect, as meticulous, as well arranged as ours is messy, ill constructed, and jumbled*'. The heterotopia of illusion and the heterotopia of compensation. The first is exemplified by the brothel, where one's illusions receive a body, a tangible shape, where unreality becomes reality. The second is conceptualized by colonization, perfect other places, other than familiar society.

Here again, the spaces of illusion or compensation are unreal and other worldly conceptions yet their existence makes us realize the possibility beyond our mundane/ ordinary reality, although we cannot discount reality. The hint of perfection pushes us to strive for perfection, like a rabbit hole to fall through, yet a temporary one. The only way is to learn from these experiences of perfection, and try to push reality towards our new understanding of perfection.

Foucault's examples for heterotopia are mentioned as typologies to explain his principles and the core idea behind it, he does not point to specific type of site to claim it as a perfect example of heterotopia, but in fact leaves room for us to imagine and create our own sites following his guidelines. Although he concludes with the metaphor of the boat as ultimate heterotopia, related to all six Heterotopian principles, being both *"…the great instrument of economic development…"* and '*the greatest reserve of the imagination'*. The heterotopia *'par excellence'*. He is very careful in his comments and examples, mostly stating about what 'can/could be' instead of what 'is/must be' and

therefore not every answer is given, mystery is not completely demystified, only revealed (Poortman J., n.d.).

Other than the above outlined principles of Heterotopia, following are a few important aspects of successful Heterotopia which are not explicitly stated, but implied by his theory, and described by various researchers studying Foucault's manuscript on Heterotopia. These includes, Balance, Mystery, Secretiveness and Creativity.

Balance in Heterotopia

Heterotopia like a coin always seem to have two sides, it is not about the one side or the other, but the very thing that lays in between both sides. Kari Jormakka states that '*Foucault's implication that the real or the normal would not exist without the abnormal is supported by many cultural practices all over the world.*' This balance is explained with examples from the King Bushmen, the Yanomamo Indians and the Greek. Besides that, balance is also shown in Greek architecture where city walls established the inside as sacred and the outside as wilderness. (Ibid., p. 126) So is indeed an important factor to our society, creating the need of the extraordinary when we are familiar with the ordinary.

Mystery, Secretiveness and Creativity

Soja and Lefebvre explain heterotopia, being *'…particular spaces of representation 'linked to the clandestine or underground side of social life' which retain 'a partial unknowability… mystery and secretiveness.''(Ibid., p. 82)*. Extraordinary and mysterious are key elements in heterotopia spaces.

Foucault's theory on heterotopia and his example are only alluding to the concept of spaces that allow for the extraordinary to exist with the ordinary as a contrast. Mystery and secretiveness compliments our very existence in the mysterious universe. This very element keeps our brain enthused and active. And when our cognition is engaged we perform at our best, we feel alive. When a space allow us to question our day to day reality and our dogmas, we progress as society. We are inspired to make connections between the known and the unknown. Our brain is trained to pattern new information, through making new connections. Any space that allows for opportunity to make new connections is the one that help us preserve our ability to stay creative and innovative, after all "Creativity is just connecting things" exclaimed Steve Jobs.

In the following pages of this section, I will illustrate few examples of various types of Heterotopia that are possible to create with the help of art and technology. These examples are not only standalone Heterotopias, but a careful juxtaposition of these examples can complement the existing spatial configuration based on the design requirements or constraints and dramatically enhance the quality of experience.

Examples of Heterotopia

Art

I read about Architect Philip Beesley in the book "Psychogeography of Everyday Life" by Collin Ellard, and since then I was curious to meet him and discuss his perspective of art in Public spaces. Philip Beesley is a professor in the School of Architecture at the University of Waterloo, famous for his work in responsive architecture and sculptures. I was lucky to attend his talk at the Media architecture summit 2016 and interview him. Recently for Nuit Blance 2016, his art installation named "Ocean" was displayed at City Hall. Ocean was designed to create a turbulent primal environment in the Rotunda of City Hall. As described in the Nuit Blance concept note for the installation, the Ocean is a constantly-changing canopy of recycled textiles which includes vast, unstable forces where brilliant bursts of light alternate with dark, surging movements and intense waves of hypnotic sound. A chorus of cries and whispers echoes within rising waves. Using fabric the installation represents an intricate and undulating mass, evoking the emergence of life in the ocean environment from unconscious realms into living form. This deeply immersive installation questions the hardened boundaries of traditional architecture and evokes self-generation, renewal and adaptation (Nuit Blanche Toronto, nbto.com).

> *I was honored to experience "Ocean" at City Hall, and was deeply moved by the atmosphere that was curated as if to convey the emotions and feelings of a personified ocean. When I entered the dark entrance, I could hear the hiss and whispers, sound of water mixed with sobs and cries. It was scary feeling at first as the space was pitch dark. When you walk further, you can feel that your iris has now adjusted to the low lighting around and you slowly start to wonder about the the source of light. The waves of droplet - like lights suspended from the dark ceiling is moves with the wind blown from an unknown source. The dramatic sound in the background makes you think about its significance. And like any other artwork, it fuels curiosity. We try to match our feelings with what we see and make our own narrative to serve as our interpretation for the artwork. The beauty and magic of any artwork is in the room it leaves for imagination to drift and follow along the meandering clues that the artist leaves behind. Only rarely do we comprehend the exact thoughts behind the artwork, but we often get close to feeling the emotions it is trying to convey. Artworks have an innocent quality to surrender to anyone who is even slightly interested to understand it. The moment you understand the art or get a feeling of understanding the piece of art, you can relate with it at a personal level.*

Fig. 42: Ocean, Installation by Philip Beesley at City Hall, Nuit Blanche, Toronto 2016 (Image Source: http://www.philipbeesleyarchitect.com/)

My feelings for the Ocean were because of my own interpretations of past experiences. The wave of droplets was made with LED lights fitted inside plastic bottles suspended from the ceiling with the help of long strip of fabric. Some of these plastic bottles had water in it which splashed inside the bottle with the movement of the fabric holding it, and the sound of splashing water gave an impression of crashing waves against the ocean shore. The spooky sound of cries and sobs from the background haunted the atmosphere as if to suggest the ocean was crying with each wave. It felt like the ocean is suffocated with the strangling waste fabric floating on its pristine water while choking it to tears due to the plastic pollution. I was impressed by the way the art installation pushed me to feel the strange vibes, making me uncomfortable and wanting to find an escape. I felt as if for a few minutes I was the ocean choking in waste that I cannot gulp down my throat and all I could do was cry. It was definitely an art work that must have left people questioning their own emotions and feelings and while resolving what they felt, they would have all felt closer to what ocean may feel in its current state. I thought it was masterful display of emotions and a brilliant method to build empathy amongst masses to educate them without preaching the pros and cons of overuse of plastic. Make them rethink about their choices and the way in which we handle such pollutants in our day to day lives. Oceans is often out of the sight of most of the city dwellers and hence out of mind. We don't care much about its health as we don't see any immediate effect on our health. Empathy rarely extends beyond our line of sight, making it difficult for us to empathise with any situation that lay beyond our vision. Art installation by Philip Beesley at City Hall literally brought the ocean to the city along with it, its struggles and problems for us to empathise and share the pain we are making it suffer. It must have triggered thoughts and series of questions relating to the bizarre sensation it left people with. And hence firing up curiosity to may be know more and at least for a few days remember what we felt and hence what the ocean feels everyday.

When asked about the role of art in public spaces which are oversimplified pluralist in their design rendering all cities to look and feel the same, he shared his famous example of snowflakes and raindrops. **He mentioned that urban designers should take inspiration from nature and understand how nature has its way of dealing with complexities in most profound and elegantly simple ways.** For example a raindrop is contained within a perfectly smooth surface, a brilliant manifestation of exquisite interiority, whereas snowflakes on the other had are perfect example of almost an equal mass or less but extremely complex inside out patterns exemplifying exteriority of nature. Like nature which takes pride in its details and intricacy at the same time always extending and spreading out to grow, learn from its past emerging into extremely complex yet perfectly patterned surfaces. He suggests art as a way to understand nature, and tries to manifest an extremely complex idea into tangible comprehensible form. The sheer honesty of art moves people and invites them to participate in its innocence.

I was not only touched by Philip Beesley's masterful conception of his ideas into delicate and intricate art installations but also his words through which he express the emotions one must have felt while experiencing his work. I think art can merge the boundaries between the real and the imaginary by fueling our curiosity, making us travel from the real spaces into the imaginary ones inside our minds. To search for answers so as to fill in the voids that the artwork might have left blank with question marks. Thus pushing us beyond the real, to discover heterotopia through novelty.

Optical Illusion

In an article on Virtual reality, Steven Johnson brings attention to some very similar technologies from the history that were responsible of creating similar effect, very well understood as optical illusion. He argues that, before the invention of the cinema in the late 19th century that fooled the eye into seeing motion in a series of still images, the most successful and famous "trick of the eye" was the invention of linear perspective, usually associated to architect Filippo Brunelleschi, although the basic rules that guided the technique were first described in the book "On Painting", by Leon Battista Alberti, published in 1435. Linear perspective, technically are nothing more than an optical illusion, but it is definitely one of the most transformative innovations of the Renaissance. Optical illusions are responsible for making crucial contribution in the history of play and wonder, right at the intersection of the parlor trickery and high art. At the end of the 18th century an Irish painter named Robert Barker became well known for his significant innovation.

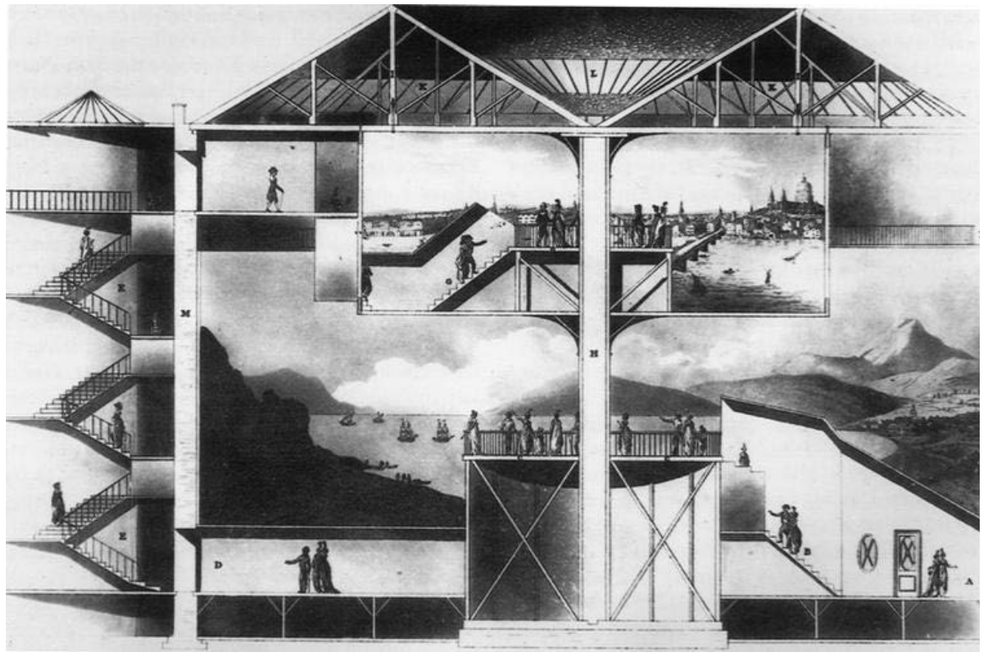


Fig. 43: An illustrated cross-section of the building housing Barker's Panorama near Leicester Square. Credit From the British Museum. (Image Source: Dave Pape, http://bit.ly/2j3aCwU)

"In the mid-1780s, Barker took a stroll to the top of Calton Hill in Edinburgh. Standing near the current site of the Nelson Monument and gazing out over the city, Barker hit upon the idea of painting the entire 360-degree view by rotating a sequence of square frames around a fixed spot, sketching each part of the vista and then uniting them as a single wraparound image. (He had to invent a new technique to compensate for the visual distortions that appeared when painting on a concave surface.) Barker was granted a patent in 1787 for "an entire new Contrivance of Apparatus ... for the Purpose of displaying Views of Nature at large." At the suggestion of a "classical friend," Barker hit

upon a name for his creation, drawing on the Greek phrase for “all-encompassing view.” He called it the Panorama. By 1793, Barker had constructed a six-story building near London’s Leicester Square, custom-designed for the exclusive purpose of displaying two separate Panoramas to crowds of paying spectators. The lead attraction was an immense vista of London encompassing 1,479 square feet. Barker ran advertisements that modestly suggested his technique was “the greatest improvement to the art of painting that has ever yet been discovered.” For a time, the bombast seemed warranted. The show was a runaway success. The king and queen requested an advance viewing, though Queen Charlotte later reported that the illusion made her dizzy.” Steven Johnson

Charles Dickens in the 19th century was enthralled by the technology of perspectives, and described it in terms that echo much of the recent excitement for virtual reality and its potential: “It is a delightful characteristic of these times, that new and cheap means are continuously being devised, for conveying the results of actual experience to those who are unable to obtain such experiences for themselves; and to bring them within the reach of the people — emphatically of the people; for it is they at large who are addressed in these endeavours, and not exclusive audiences. ... Some of the best results of actual travel are suggested by such means to those whose lot it is to stay at home. New worlds open out to them, beyond their little worlds, and widen their range of reflection, information, sympathy and interest. The more man knows of man, the better for the common brotherhood among us all.”

Bavarian musician and inventor the Johann Nepomuk Maelzel in September 1812, found himself in Russia, at a perfect time to witness the legendary burning of Moscow that greeted Napoleon’s arrival in the city which led to his defeat. The fire and the battle of Moscow inspired many great artist to do spectacular work: Tolstoy’s “War and Peace”; Tchaikovsky’s “1812 Overture.” But one of the very first and original effort to represent this historically significant event was engineered by Maelzel, in the form of an animated diorama called “The Conflagration of Moscow.” Maelzel’s creation had its premiere in Vienna, but he would ultimately take it across Europe and North America, astounding the audiences for decades with his tantalizing reconstruction of the great city on fire (Johnson S., 2016).

In his book, How Play Made the Modern Word, Steven Johnson refers to a detailed inventory of the shows of the diorama, that toured the United States and gives us some sense of the scale of the production. “Movable frames representing the buildings of Moscow — the Kremlin, church spires, castles — were designed to collapse or explode on cue. Behind the skyline, Maelzel hung a transparent painting that suggested a haze of smoke and fire; behind it another painting depicted other buildings in the distance ablaze, with a moon glowing in the night sky above the carnage. At the front of the stage, two bridges and a causeway carried more than 200 miniature Russian and French soldiers. Fire screens enabled actual flames to creep across the urban landscape without damaging any of the equipment.”

The story narrated by “The Conflagration of Moscow” was the not as interesting, although the events followed a prescheduled sequence on the stage: Napoleon’s army advanced; the Russians retreated; flames surged across the skyline, but the true attraction was the spectacle that came from the feeling of immersion, just like Barker’s Panorama. One doesn’t go to watch these illusion shows to follow a storyline; because to feel immersed while experiencing a stunning place, or time, or perspective, that may otherwise be impossible to inhabit” (Johnson S, 2016).

This urge to inhabit and experience other spaces (heterotopia) or time can be satisfied through interesting illusions or artworks in public spaces so as to inspire and tickle creativity.

Cinema

In his paper on “Cinema of the Not-yet” Adrian Ivakhiv argues that **“cinema is by its nature heterotopic: it creates worlds that are other than the ‘real world’ but that relate to that world in multiple and contradictory ways. The landscapes and people portrayed in a film are affectively charged in ways that alter viewers’ relationship to the real objects denoted or signified by them.”**

The term used in the early days for Cinema was ‘Moving pictures’: Pictures that moved. From the 1850s on, there had been experimentation by photographers and others in reproducing human motion. First short motion pictures arrived in the 1890s. In their initial phase, motion pictures focused just on movement. There was no sound, usually no plot and no story, only movements. One of the earliest movie shorts was a collection of 15-30 second scenarios created by the Lumiere Brothers, in France. The first movie “shows,” which lasted 5-8 minutes, were a collection of these short scenes: a train arriving at a station, a man watering his garden, men playing cards, people getting off of a ferry boat and a street vendor selling his wares (Washington.edu).

“By today’s standards, these early movies were extremely primitive. We’ve become accustomed to fairly elaborate movie effects (think of the Star War movie series, Matrix, or the James Bond movies). However, for people at the start of the movie era, even these somewhat primitive films were exciting and highly realistic. For many Americans, the movies brought them their view of a street car, or of the Pacific or Atlantic oceans. All of this seemed quite real to motion picture viewers. In one film, a train pulled into a station -- coming directly at the viewers. Some theater viewers were scared, thinking the train would come right into the theater; some in front rows panicked and ran out” (The History of Motion Picture, University of Washington).

Cinema is a perfect example of heterotopia with a narrative that carries us beyond time. Sometimes a whole life span worth of experience in short span of 100-120 minutes. Although physically we are in a same space, when the lights are turned off and the projection on the screen is all you see, our minds is tricked into believing everything we see, our only anchor is our physical body which sits firm on the seats acting as a bridge between the real and imaginary.

Cinema can be interestingly used to activate public spaces. (A few days ago I attended a free) For instance in a free screening of a film called “Haida Gwaii: On the edge of the world” at Fort York, Toronto. The movie is a documentary which explores the breathtakingly beautiful archipelago off British Columbia’s northwest coast - home to a dedicated community is united to protect land and sea for the next generation. It was a perfect to learn about the country in a more than pleasant setting out in the open under the clear sky, with sunset in the backdrop. Lying on the green lawn, more than 100 people joined the fun. It was a very graceful way to share some ancient knowledge and its current status with the audience as a part of their culture. It was amazing how an experience of watching a movie, in this case a documentary on a sensitive issue, staged in a perfect setting of a public space was nothing less, but a perfect heterotopia.

Media Architecture

Advancements in display technology and it’s integration with new types of building materials, is leading a new type of hybrid architecture that is novel, breaking free from existing conceptions of facade, , surface, structure, lighting and motion imagery in forms of public projections, urban screens, and media façades. Light Emitting Diode (LED) displays combined with the inherent

structure of the built forms allow high definition imagery to be integrated with the facades, even in direct sunlight (mediaarchitecture.com).

Media Architecture Summit 2016, was my grand introduction to the potential of this form of architecture as it exists today. Seeing media-architecture ubiquitously taking over the urban spaces does not make one think of what it is doing to our experience unless you pause and reflect upon what has changed and what's changing in our experience of public spaces. "Media architecture is literally changing the way a place unfolds and the experience of the space itself" argued Scott Mcquire a professor from University of Melborne at Media Architecture summit, 2016 (MAS).

Looking at some of the most intelligent Media architecture displays across the world, makes it possible to imagine the possibilities that may completely change the way we understand our surroundings. Some of the Media architecture façades that were discussed at the conference were interesting displays of deeply stunning concepts, and some where exciting interactions curated to engage public in creating an animated atmosphere rendered with play of light and shadows.

Rafael Lozano-Hemmer, an internationally acclaimed media artist addressed a keynote at the MAS, and shared some really interesting interactive media architecture projects. One of which was the "' which is a large-scale interactive installation designed to transform the Park Avenue Tunnel during the "Summer Streets" Annual Celebration in New York City (2013). The tunnel goes from 33rd to 40th streets and is open to pedestrians for the first time in its almost 200 year history. The piece consists of 300 powerful theatrical spotlights that produce columns of light along the walls and cladding of the tunnel. All fixtures are floor-mounted right beside the walls, seven feet from each other, shining past the spring line, fading along the internal curved surface of the tunnel, just reaching its crown.

Fig. 44: Park Avenue Voice Tunnel
(Image Source: http://www.lozano-hemmer.com/voice_tunnel.php)

The intensity of each light is automatically controlled by the voice recording of a participant who speaks into a special intercom that is in the middle of the tunnel. Silence is interpreted as zero intensity and speech modulates the brightness proportionally, creating a morse-like code of flashes. Once a recording is finished, the computer plays it back as a loop, both in the light fixtures that are closest to the intercom as well as on an inline loudspeaker.

As new people participate, old recordings get pushed away by one position down the array of lights.

So that the "memory" of the installation is always getting recycled, with the oldest recordings on the edge of the tunnel and the newest ones in the middle. At any given time the tunnel is illuminated by the voices of 75 visitors. Once 75 people participate after you, your own recording disappears from the tunnel, like a "memento mori" (an object serving as a warning or a reminder). The voices can be heard through an array of 150 loud-speakers placed along the tunnel, in perfect synchronicity to the blinking lights that are near-by. The effect of the project is not cacaphonous because each speaker does not play all 75 recordings, it only plays the voices from lights that are immediately beside it" (Hemmer, 2016).

This project was interesting especially because of its perfect timing, it was around the time when Edward Snowden leaked the information about NSA watching over American lives, causing a havoc, raising concerns around the country on sensitive issues of privacy and freedom of speech. This was a very courageous move by the New York City Government to allow this project to roll out and run smoothly with absolutely no censorship on what was being said on the speaker phones, in effort to restore faith and trust back in the governance. Here again, the architecture blended with media helped curate a space, although transitory in nature and execution allowed people to express freely, transporting them into a netherworld which was free from fear of surveillance, a perfect conception of Foucault's heterotopia using art and cutting edge technology.

Mixed Reality/ Virtual Reality/ Augmented Reality

"The Scottish scientist David Brewster was one of those 19th-century characters with no real equivalent today. An ordained minister in the Church of Scotland, he took an early interest in astronomy and became for a time one of the world's leading experts on the science of optics. He also harbored a great fondness for popular amusements, and at some point in the early part of the century, he began frequenting a theatrical horror show in the West End of London called the Phantasmagoria. He went in part as a debunker, a skeptic hoping to reveal the secret craft behind the spectacle. But he also sensed that something profound was lurking in the trickery. He suspected that the showmen were exploiting some intrinsic quirks in the human sensory system — perhaps, he hoped, rendering them more intelligible to the scientist. Brewster called the world of scientifically produced illusion "natural magic."

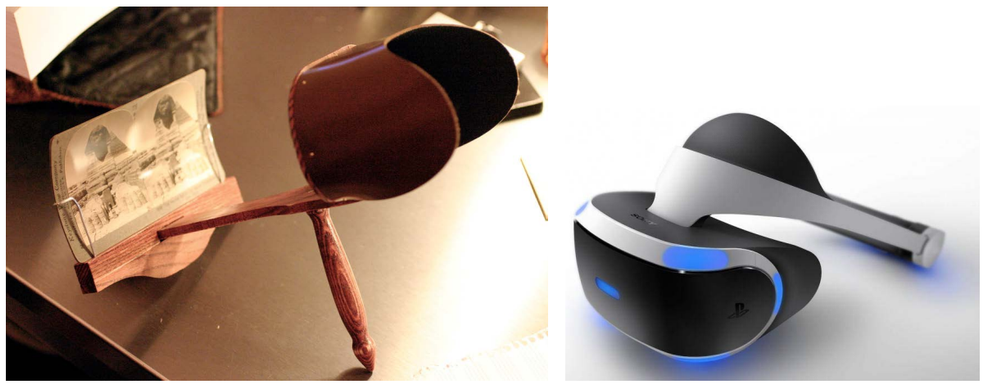


Fig. 45: 19th-century wooden and a modern virtual reality headset (Image Sources: Left: Zach Copley, http://bit.ly/2jfF1Hl Right: BagoGames, http://bit.ly/2ioUvZS)

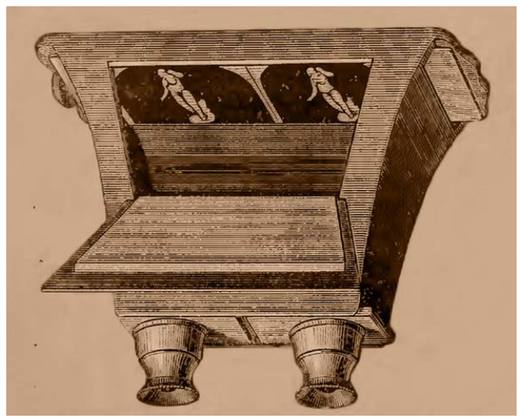


Fig. 46: An 1849 rendering of David Brewster's stereoscope design. (Image Source: Wikimedia Commons)

The Phantasmagoria came to London in 1801, after a decade or two of development in Germany and France. Relying heavily on ghostly magic-lantern projections, the show submerged its patrons in a multisensory vault of dread and illusion — in contemporary terms, a cross between the immersive theater of "Sleep No More" and Disney's Haunted Mansion. Shortly after its arrival, the success of the Phantasmagoria and a handful of similar shows set off a kind of entertainment version of the Cambrian explosion. Bizarre new species of illusion proliferated across the West End. The names themselves, with their strange Greek neologisms, suggest just how far the language strained to tout the novelty of the experiences. According to "The Shows of London," by Richard Altick, a visitor to the city in the early to mid-1800s could enjoy a "novel mechanical and pictorial exhibition" called the Akolouthorama; a rival spook show called the Phantascopia; an exhibition called the Spectrographia, which promised "traditionary ghost work!"; an influential mechanical exhibition dubbed the Eidophusikon; and the Panstereomachia, "a picto-mechanical representation," in the words of The Times of London.

Brewster himself was something of a natural magician. Right around the period he was studying the Phantasmagoria, he invented the kaleidoscope, which for a few years was the PlayStation of the late Georgian era. (Brewster barely made a penny from the device, as imitators quickly flooded the market with clones of his original idea.) Decades later, he invented the lenticular stereoscope, a hand-held technology that fools the eye into perceiving two distinct flat images as a single 3-D scene. This time around, Brewster managed to build a successful business selling his contraption, branded as a "Brewster Stereoscope." Queen Victoria famously marveled at one during the Great Exhibition of 1851.

Fig. 47: Paul de Philipsthal's Phantasmagoria show, which opened in London in 1801. (Image Source: Wikimedia Commons)

By the dawn of the 20th century, almost every species in the 19th-century genus of illusion was wiped off the map by a new form of "natural magic": the cinema. The stereoscope, too, withered in the public imagination. (It lingered on as a child's toy in the 20th century through the cheap plastic View-Master devices many of us enjoyed in grade school.) But then something strange happened: After a century of irrelevance, Brewster's idea — putting stereoscopic goggles over your eyes to fool your mind into thinking you are gazing out on a three-dimensional world — turned out to have a second life. The paradox of V.R. is that when you see the world through someone else's eyes, you can't actually see the person's eyes. You can see what the person is seeing, but it's much harder to grasp what he or she is feeling. A cinematic close-up conveys emotional depth far more effectively than a point-of-view shot in a 360-degree film can. V.R. there has capacity to provide a new kind of experience that we don't really have a word for it: perceptual empathy, sensory immersion" (Johnson S, 2016).

In his essay on Virtual Reality, Eliott Edge argues that human civilization has always been a virtual reality. "At the onset of culture, which was propagated through the proto-media of cave painting, the talking drum, music, fetish art making, oral tradition and the like, Homo sapiens began a march into cultural virtual realities, a march that would span the entirety of the human enterprise. We don't often think of cultures as virtual realities, but there is no more apt descriptor for our widely diverse sociological organizations and interpretations than the metaphor of the "virtual reality." Indeed, the virtual reality metaphor encompasses the complete human project" Eliott Edge.

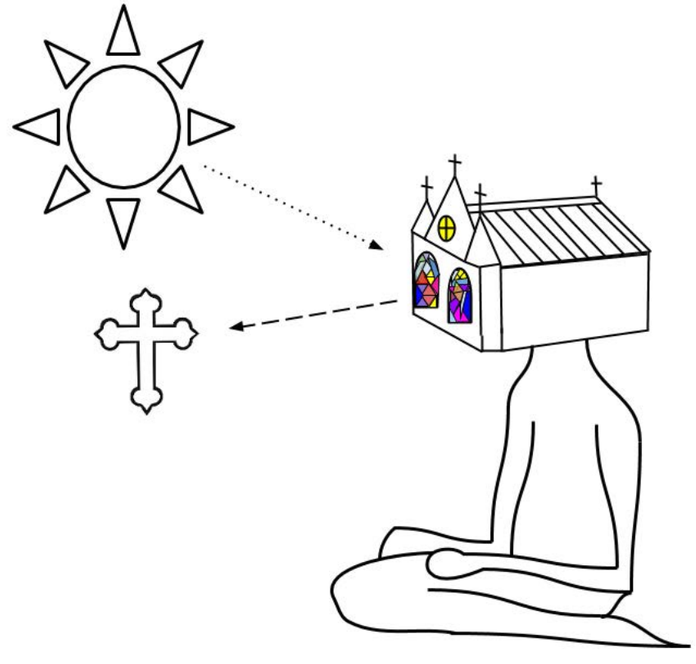


Fig. 48: Illustration showing Church as Virtual Reality. Sketch by Elliot Edge (Permission taken)

Jim Blascovich and Jeremy Bailenson, virtual reality researchers in their book Infinite Reality suggest, “[Cave art] is likely the first animation technology”, where it provided an early means of what they refer to as “virtual travel”. When one is in the cave, they are amidst the media in that cave, the hand-drawn, fire-lit art, represents the plains and animals outside—a completely different environment, one facing entirely the opposite direction, beyond the entrance of the cave. “When surrounded by cave art, alive with movement from flickering torches, you are at once inside the cave itself whilst the media experience surrounding you encourages you to indulge in fantasy, and to mentally simulate an entirely different environment. Blascovich and Bailenson suggest that in terms of the evolution of media technology, this was the very first immersive VR. Both the room and helmet-sized VRs used in the present day are but a sophistication of this original form of media VR tech” Eliott Edge.

Fig. 49: Ancient human cave art (Image source: www.pixabay.com)

This explains our obsession with virtual reality as a form of heterotopia since the time when early humans used to spend time making and enjoying cave-art. It assists them to imagine and hypothesise the nature of the unknown forces at play and through their imagination to make sense of reality around them. With the quality of virtual reality technology improving, it opens up many opportunities to mix our reality with virtual elements to help realise heterotopia by augmenting novel experiences to our existing ones.

At the Immersed conference 2016 held at Ontario Science centre, there were many companies demonstrating their virtual and mixed reality gears. The most interesting ones of all, that really made me wonder about the potential it holds to shape new spaces of our future was the augmented reality section. Vrvana, a Montreal based company which is quite renowned for developing virtual reality and augmented reality headset prototypes for a truly immersive virtual reality experience, was one amongst others to have their demo-station. I tried their headsets called “Totem” which was capable of creating completely virtual as well as augmented experience with the help of camera fitted on the front of the headset. Once you wear the headset, the volunteer helped me hold a booklet and asked me to flip the pages, the booklet had some boxes filled with black and white filled squares, something that looked like a QR code. When you look at the booklet with the headset, you can see 3d models of Airplane suddenly popping out of the book. Flipping pages one by one revealed models of cars and automobiles emerge in front of your eyes from the cryptic and otherwise two-dimensional QR code. So the book I held was real augmented with a layer of 3d information floating above the booklet in space, only to be seen with the help of the goggles I was wearing. I could think of a time in very soon in the near future when the size of these goggles will shrink to that of our bi-focal eye glasses, or even lens with development in nano-technology. And once that happen, we will read about the ‘reality as it exists today’ only in history books of the future.

Holograms

A hologram is a photographic recording of a light field, a two-dimensional surface which show a precise rendition of a three-dimensional images of real objects that can be seen without the aid of special glasses or other intermediate optics. Holograms reconstruct the 2D scene from different points of view and are considered to be truly 3D, because they allow the viewer to see different perspectives of a reconstructed 3D object from different angles and locations. The stereo vision of humans sees two different points of view in each eye, causing the image to appear to have depth. Like a photograph, a hologram contains information about the size, shape and color of an object. Where holograms differ from photographs is that they are created using lasers, which can produce the complex light interference patterns, including spatial data, required to re-create a complete 3D object (The Agency for Science, Technology and Research (A*STAR)).

Hologram of any holographed object displays the object in such a way that it appears to pop out or set in in the space field outside and inside the surface. This effect is created by capturing and recording the reflected light from the object being holographed. The holograms look like blank vague surfaces without the light source focusing on it. They come to life only when the source of light is shined upon the holographic surface. Some holograms have a reflective surface like a mirror, and when the light is focused on it, the mirror comes to life as if reminding us of a frozen moment that it once reflected in the past. As you move around and look at holograms from different directions, you can see the objects within the images from different perspectives, as though you were actually walking around physical objects. Hence giving us a very realistic impression of a moment frozen in time.

Advanced methods in holography allows us to even capture a snapshot of a movement. When one moves around the hologram one can notice a movement to and fro. This holds a lot of potential to create dramatic effects with holograms in daylight. The interesting differentiator for Holograms is that it can work brilliantly in bright day light unlike most projections or other media surfaces which needs dark environment. Although focused lights and lasers are preferred, but the advancement in this technology holds promise to realise the conceptions as imagined by the makers of Start Wars and other sci-fi movies, where the detail renderings of Holographic images were way ahead of the technology itself.

“I see Holograms as one of the interesting piece in the puzzle to recreate a sense of Heterotopia in

the near future. Even with today's technology, holograms offer capability to extend our space beyond its footprint by creating a sort of an illusionary world inside its 2d plane. I won't be surprised if the current depth of about a few feet outside and inside of a 2d holographic surface increases to create may be a depth cue of a few meters with advancement in Holographic technology. And by doing so, one will be able to walk through the 3d illusion, not only see the image from sideways, but possibly be able to move around it and view it from all the angles from the front as well as its rear end" Michael Page, OCAD U.

Slowly crossing the boundaries of the physical space, holograms will be able to allow people to enter the virtual 3d spaces of nostalgia, rendering frozen moments from the past come alive (eg. Analog holograms), or through digital holograms render a complete new mystical world of possibilities.

Fig. 50: Analog Hologram at OCADU Phase Lab (Own)

Fig. 51: Holomentis: a digital hologram sculpture by Digital Futures Student, Marcus Gordon and Phase Lab at OCADU (Own)

Heterotopia for Creativity and Innovation

The book '*Collage city'*, starts with a chapter about utopia, mentioning following quote by Ernst Cassirer:

'Where we do not reflect on myth but truly live in it there is no cleft between the actual reality of perception and the world of mythical fantasy'

(Rowe. C & Koetter. F, 1990).

"Are we blinded by the ordinary? Maybe we are. In that case, we might need something from outside the ordinary, something extraordinary, to question the ordinary. Heterotopia's mystery might be capable of doing so." argues Jos Poortman in his essay on Heterotopia.

In his essay he refers to the book the Collage City, where the author exclaims that human beings tried to free themselves from the plants and animal kingdom by creating their own built environment, but by doing so we have bounded ourselves by our own rules and limited ourselves within the boundaries of our society. In our effort to create an environment which follow laws and order unlike plant and animal kingdom, in our effort to have complete control on our surroundings, we have lost heterogeneity by succumbing ourselves to the homogeneity. Our communities are filled with spaces that are void which can be filled and outlined *(Rowe. C & Koetter. F, 1990).*

Foucaults manuscript contest this statement when declaring the heterogeneous character of space, maybe he saw the gap in the spaces being conceived in our day and age and hence tried to underlined the importance of the missing elements through heterotopia.

Collage city alludes to an interesting aspect of our society's history: "*… the chimpanzee and the orangutan are distinguished from man not by what is known strictly speaking as intelligence, but because they have far less memory. Every morning the poor beasts have to face almost total oblivion of what they lived through the day before…. Similarly, the tiger of today is identical with that of six thousand years ago, each one having to begin his life as a tiger from the beginning as if none had existed before him…Breaking the continuity with the past, is a lowering of man and a plagiarism of the orangutan".*

Our experiences help us to develop and grow. Every question we answer gives birth to new questions. We learn from the answer of the old question, from each lesson learnt we change and ask a new question. Our curiosity to know more and comprehend everything pushes us further. Curiosity helps us grow and advance forward. Hence, it is very important for us as a society to preserve our curiosity and ability to question.

We need environments which assist our curiosities by enabling and allowing us to question, inspiring us to push our boundaries. Spaces that offer safe environments to express ourselves through art, through technology, act as the envelopes that make us wonder about limitless possibilities. We need spaces that don't imprison us within their limits and boundaries, but those that demonstrate our ability to bring order in chaos by contrasting our systematic understanding of our built environment against the infinitely

complex natural environment beyond us. Such spaces which are perfectly balanced with elements of heterogeneity and order act as fuel to curiosity at the same time inspire creativity by making us question the seemingly chaotic balance.

Now that I have established the importance of the Philosophy of Heterotopia and its role in promoting positive human emotions; established relationship between the spatial configuration and human emotions, and proposed a concept to superimpose narratives to existing spatial configuration to enhance experiences, In next section of the report, I have synthesized the overall understanding into a single framework. This framework architects or designers to connect all the pieces of the puzzle, to understand or design a space to induce Heterotopic experiences.

Part 6

“Heterotopic Experience”

= Space + Story (Narratives)

Synthesis and Framework

Proposed Hypothesis

Following the principles of Heterotopia, one can infer that the heterotopic spaces inspires questioning, it is the space or experience where one is confronted with both aspects of positive and negative elements, real and imaginary, providing access to all kinds of data points, by exposing one to more possibilities through a dialogue of questionings. Since in any Hetetotopic experience people are never in a situation of homogeneity, they are constantly directed to question the boundaries. They are forced to test their skills of reasoning and logic in such experiences. As the boundaries between real and imaginary blurs, they feel the urge to use their imagination to look for clues to comprehend their novel experiences. This increases the possibility of pattern recognition and sharpens the ability of making new connections. Like Steve Jobs suggest the idea of creativity is connecting things, the place that inspires one to think of new connections by exposing them to new paradigms and questions, can therefore assist them to come up with new, innovative and creative solutions. Therefore in my understanding Heterotopic experiences can be ideal to foster creativity and innovation.

This can be further extrapolated to understand the type of emotions one might feel in such spaces that foster creativity. Since creativity is basically an ability to make connections, a place that can allow or inspire such connections can help people to become more creative. Creativity is rewarding as a feeling, when one creates one feels empowered, creation being an outcome of human tendencies to work and express, it feels satisfying. Therefore, we can draw an inference that when humans are able to act to respond to their inherent human tendency, they must feel positive, as it is basically a feeling of empowerment. One can therefore think of a hypotheses that Heterotopic experience boost positive emotions. I will attempt to verify this hypothesis through a survey and a case example in this section of the report.

Understanding the Relationship between Subject-Object and Heterotopia with an awareness of Human Emotions

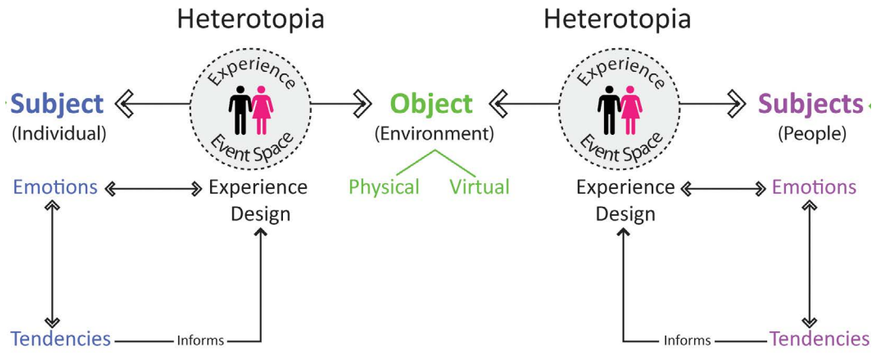


Fig.52: Diagram generated to explain the relationship between Subject, Object and Heterotopia (Author's Work)

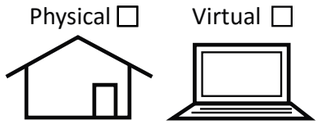
Figure 52 shows a relationship between the various actors in an experience. **Experience**, which is the result of interaction between **Subject** and the **Object.** The Subject can be a single individual or a group of people. In either cases, **the subjects** are driven by basic **human tendencies**, they are bound to feel **emotions** as a response of their **experience** in a given **environment**, as analysed in the Part 3 of this report. In this case the experience of feeling emotions when walking into a new environment is the ''Heterotopia'' which follows the principles proposed by Michel Foucault in its theory referred in the Part 5. Heterotopia as outlined in the part 5 of the report is a positive experience reinforcing positive emotions in a surrounding designed to provoke positivity and creativity. The design of the Experience by superimposing narratives can be created following the supporting Framework 02 based on the Viewpoint and Compositions theory as discussed in Part 4. The spatial configurations that trigger emotional responses as illustrated in Framework 01 can assist in understanding spaces or even designing new spaces from scratch.

Once a designer understands above relationship better, they can proceed to identify the types of human tendencies they wish to respond to, along with the emotional responses they can expect based on their choices as illustrated in the Framework 03 proposed below. By using the framework proposed below the designers will be able to verify if their proposal will work to create an Heterotopic experience.

Towards Heterotopia

Based on the theory of heterotopia, it can be inferred that Michel Foucault imagined this place to invoke positive emotions. If one agrees to follow this idea further, we can split the wheel of emotions to understand Real spaces and their relationships with human emotions. As Utopia is an imaginary space, we may not know what emotions it may invoke, emotions in Utopia and Homotopia can be either homogenously positive or homogenously negative. But based on the study so far we are able to comment on emotions that can be invoked in real spaces. Therefore Heterotopia and Homotopia can be understood by plotting human emotions on the Two by Two matrix of experience in an event space. Framework-3 is the representation possible configurations of **experiences in an event space** and corresponding emotions. It can be understood that Heterotopic experiences almost edits negative emotions from an experience.

FRAMEWORK 03



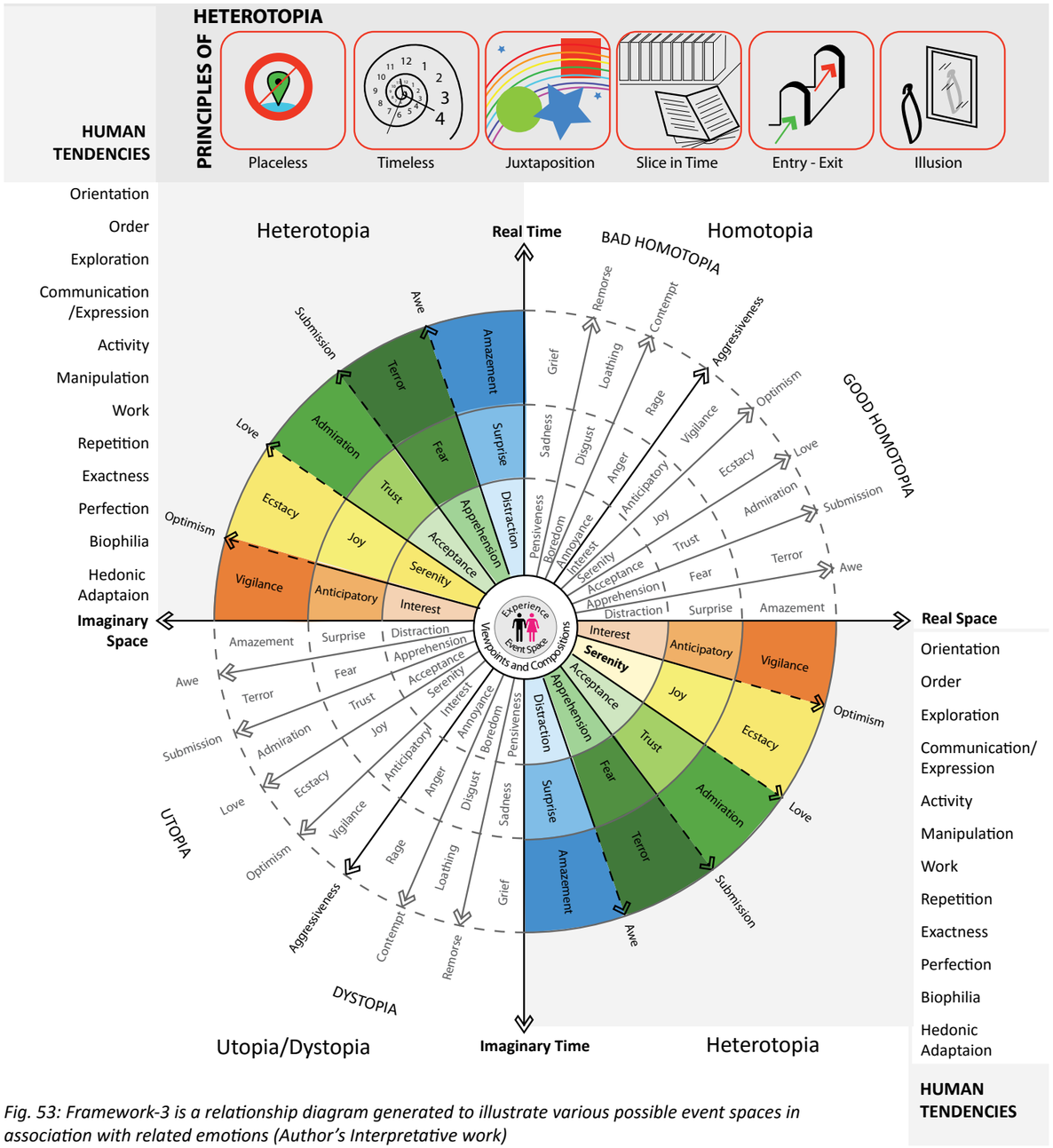


Fig. 53: Framework-3 is a relationship diagram generated to illustrate various possible event spaces in association with related emotions (Author's Interpretative work)

Design Process

An ideal order of sequence to using the proposed frameworks, to proceed in any design project will include following steps:

1. Study the Urban Sociology of the given public space that is study the history and context.
2. Decide the Human Tendencies you wish to respond to, and mark them on the Framework 3.
3. Describe the human emotions you would like to invoke in an experience, Check the list of emotions against the framework to ensure the emotions fall in the Heterotpia quadrant of the framework.
4. Outline the elements and features of Architecture that may already exist or may be needed to enhance or control human feelings in the given space, so that you can take advantage of existing situation and capitalize on your choices effectively to design a coherent experience. Spot these features or check for similarities with the features illustrated in the Framework-1, to understand the emotional triggers you may be aiming for.
5. Decide whether the spatial configuration you are deciding to design has physical or virtual elements, list the physical and virtual elements of the space in the framework.
6. Ensure you are following principles of Heterotopia and cross check against the checklist on the framework.
7. Incase you wish to further regulate the experience in detail, refer Framework-2, write the script for the experience to superimpose Narrative by identifying Viewpoints and Composition elements you may wish to integrate.
8. A scan of available technology to compliment with your desired goals, so as to assist in effectively controlling or allowing for emotions to grow or fade can help save a lot of time and money, and can also be crucial for enhanced quality of experience.
9. Designers can use the tools proposed to self-evaluate or assess their projects or even plan for new projects.

An example to demonstrate the process of using the proposed framework to test whether a given space or experience was a successful Heterotopia is described below.

Case Example: Understanding Nuit Blanche as Heterotopia using the proposed framework:

From sunset to sunrise, spectators fill Toronto's streets for the contemporary art festival, Nuit Blanche. For 11 years the event has nurtured cultural engagement, making contemporary art accessible to a masses and diverse audience. Nuit Blanche continues to showcase and transform the city in the most exciting and exceptional ways. With more than 90 contemporary art projects from local, national and international artists, ranging from sculpture and performance art to interactive installations and mixed-media, year after year Nuit Blanche, 2016 attracted both local and out-of-town audiences, with an estimated attendance of over one million people, including 205,000 out-of-town visitors (Nuit Blanche Toronto, nbto.com).

This year Nuit Blanche's overarching theme was "More Art, Less Sleep" encouraging people to experience the city transformed by artists. Under the direction of four curators, Nuit Blanche, Toronto this year featured more than 30 public art projects by local, national and international artists. The main attraction for the event this year was "Oblivion", curated by Janine Marchessault and Michael Prokopow, featuring three exhibition projects at Nathan Phillips Square and City Hall. Director X, Floria Sigismondi and Philip Beesley considered the elemental aspects of our cosmic existence to represent in the form of art installations very typical of their own style. Oblivion represented destruction and forgetting, through the pitch-blackness of pure and final absence, exploring the possibilities of adaptation and unprecedented renewal.

Fig. 54: Nuit Blanche Art Projects 2016: Pneuma or Breath of Life in Nathan Phillips Square. The work is a spraying water screen where images are projected. The author is Floria Sigismondi from Los Angeles, USA (Image Source: Sean_Marshall, http://bit.ly/2i2TTrR)

"Director X presented a captivating interpretation of the death of the Sun that is simultaneously scientifically informed and poetically inspired. A forty-five foot globe serves as an enormous three-dimensional screen for the projection of celestial images and sounds. Floria Sigismondi presented a performance of transcendence; a water-borne journey of liquid dreams whose fragility are at once intimate and universal. Philip Beesley evokes the protean ecologies of wonder that define the

oceans of Earth through an immersive canopy of living textiles. Autonomous and connected, these works encourage reflection on the immensities, vulnerabilities and breathtakingly terrifying realities of the universe" (Nuit Blanche Toronto, nbto.com).

Fig. 55: Death of Sun by Director X (Image Source: Wikimedia Commons)

The art installations at City Hall, were especially exciting as they were out in the open, reactivating the whole public space, giving it a whole new flavor of novelty and surprise. Amongst the other installations which were not a part of Oblivion, but right beside the City hall was the 'Literature vs. Traffic'. "Created with the help of volunteers, this interactive light installation transformed a street that is normally allocated for vehicles into a river of books overflowing in a symbolic gesture. The donated books became the conqueror of public space with traffic yielding to the modest power of

the written words. During the last few hours of the night, these books of diverse topics could be claimed by anyone who wanted to take them, signifying that the installation recycled itself. In the end, the cars returned to occupy the street again, but for many, the books they took home and the memory of the transformation changed their relationship with the street".

"Luzinterruptus is an anonymous artistic group that carries out urban interventions featuring light installations in public spaces all over the world. Whether drawing public awareness to social and political issues or embellishing anonymous corners and existing objects, their work always transforms the space" (Nuit Blanche Toronto, nbto.com).

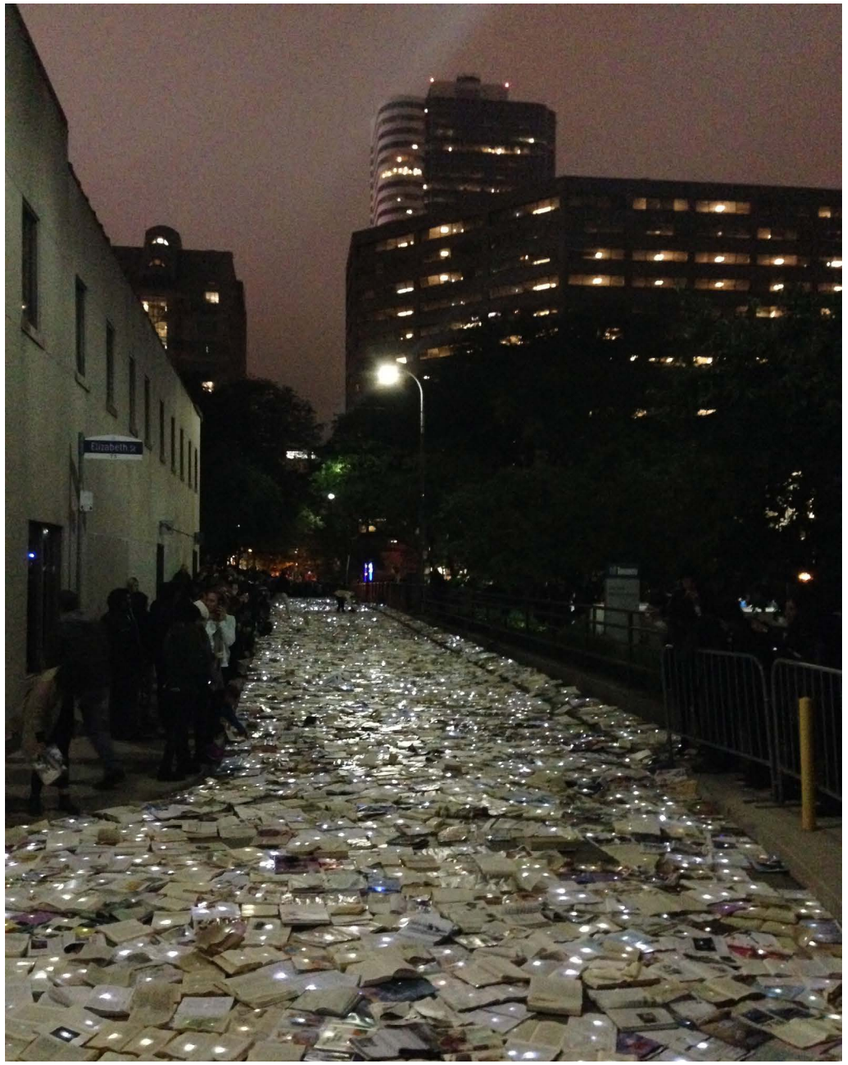


Fig. 56: Literature Vs. Traffic (Photograph by: Jyotish Sonowal)

My personal experience witnessing and experiencing Nuit Blanche was surreal, I felt Nuit Blanche was a night when imagination came to life only for one night. This in my understanding was a best way to verify the proposed concepts about the emotions in relation to the framework 03, designed for Heterotopia. To begin with we can use framework 03 as a template to assess whether Nuit Blanche fits the framework of Heterotopia. To verify this, I conducted a survey with a sample size of 25, with people from different age groups and genders. I asked the participants 4 simple questions related to their experience at Nuit Blanche. The Participants were asked to highlight any 3 emotions that they felt at Nuit Blanche 2016 in Toronto, relate a word which describes closest human tendencies that they thought were being addressed at the Art festival this year also to plot their experience in any two quadrant with associated feelings. The survey results and the findings to support the proposed framework can be find in the appendix. 1., although the aggregated results from the survey is documented below to demonstrate the use of framework 03.

Along with Framework 03, We can also use Framework 01 to crosscheck spatial configurations at City Hall, which was one of the main attraction for Nuit Blanche and assess whether the emotions suggested by participants in the survey align with the Psychology of Design elements. I have highlighted the spatial markers on the framework to show the associated emotional triggers.

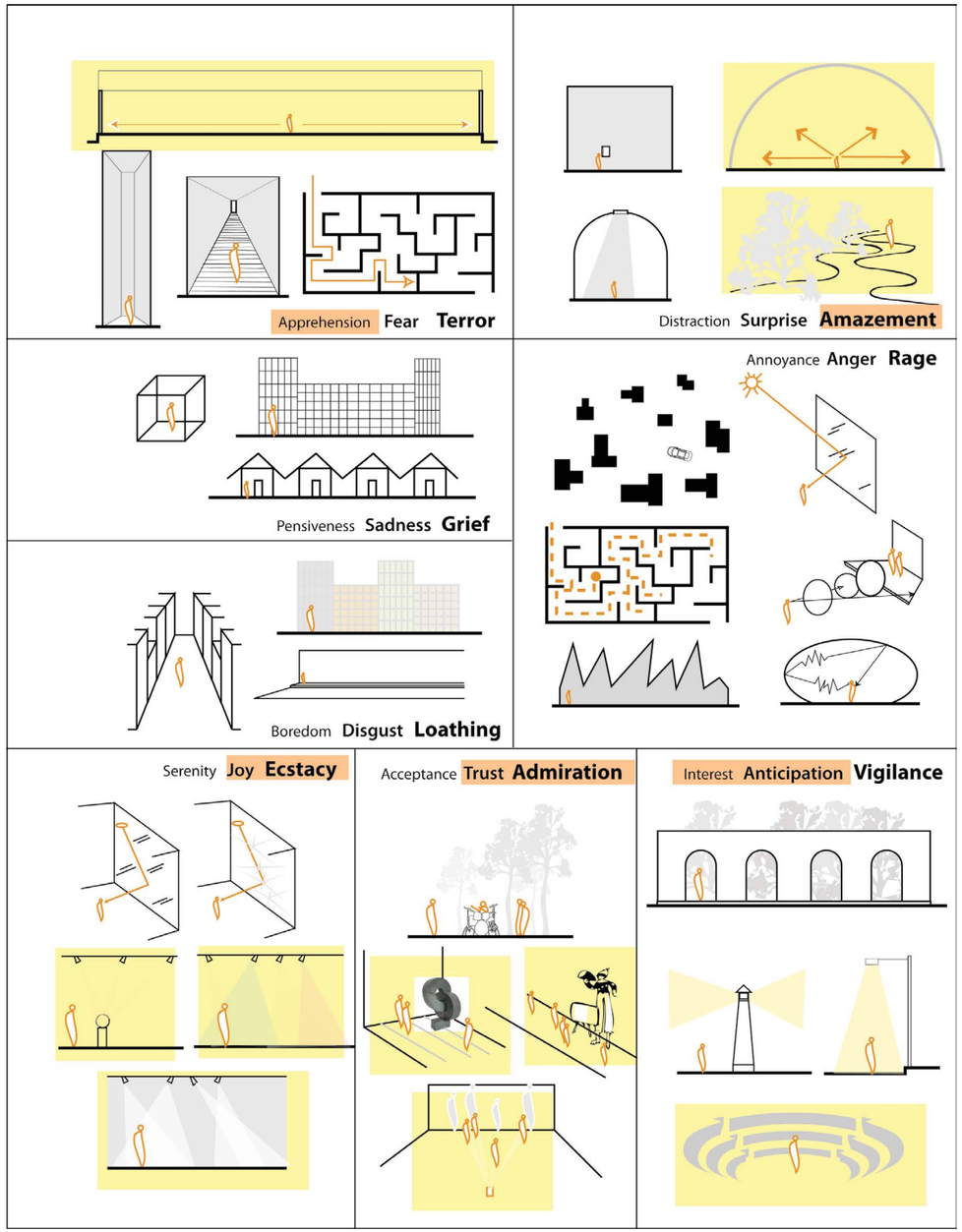


Fig. 57: The spatial elements that assisted in staging the display at City Hall, Nuit Blanche, Toronto are highlighted in yellow on Framework 1, where one can notice the corresponding emotional responses that can be expected in such a space (Author's work).

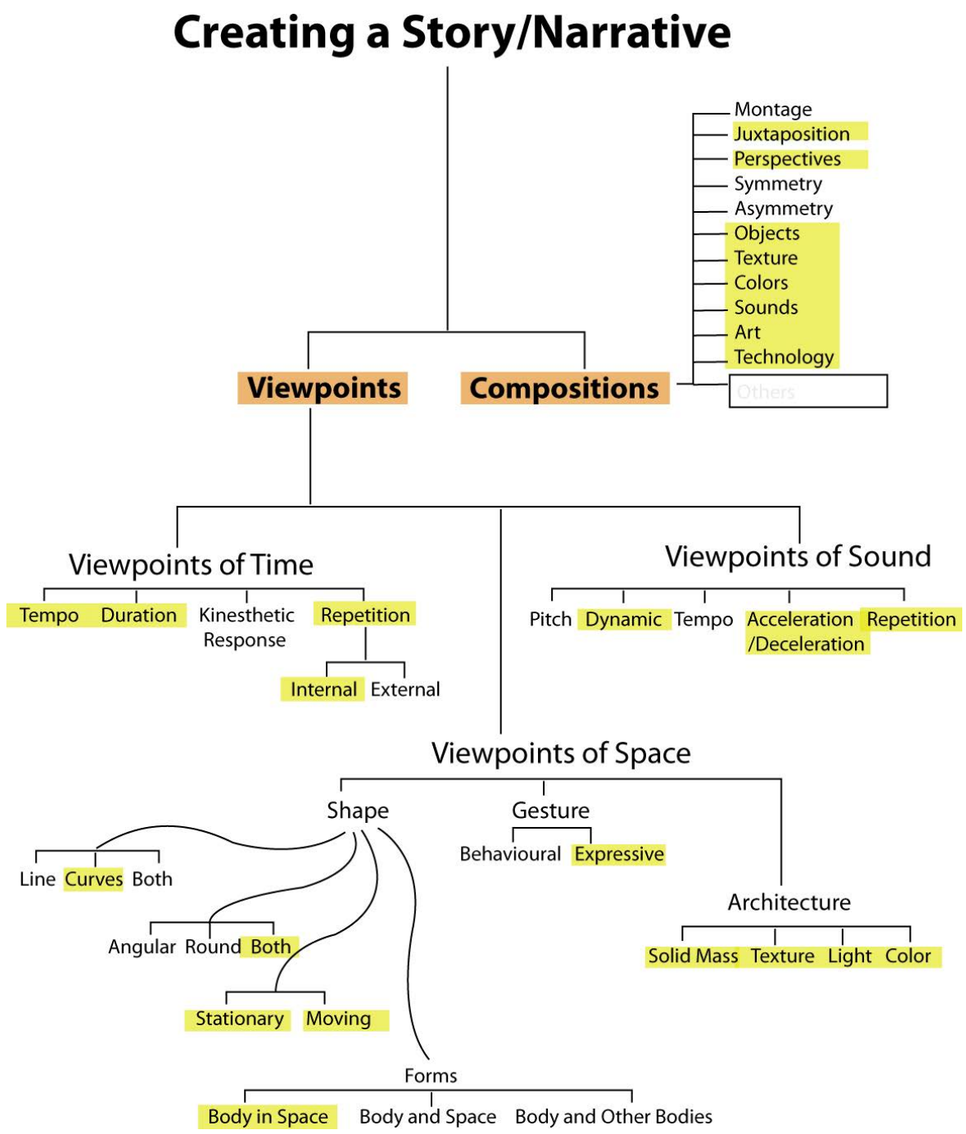


Fig. 58: Elements used to create the experience at City Hall, Nuit Blanche, Toronto are highlighted in yellow on Framework-2 (Author's work)

Framework 02 can be very useful to evaluate any design and document the elements used in its Experience design. Here I have highlighted some of the elements that were used at Nuit Blanche that contributed to make it a successful event.

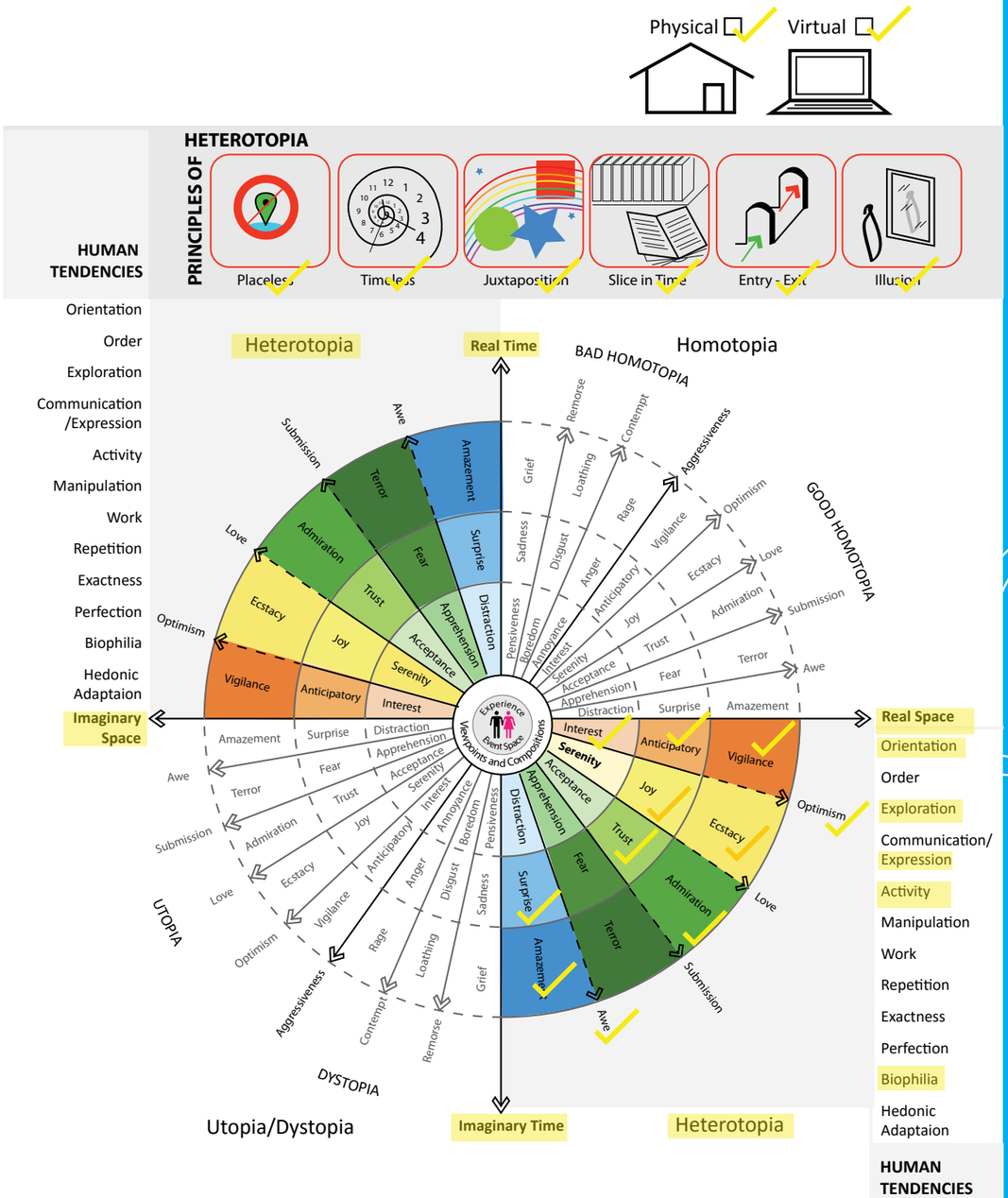


Fig. 59: Survey results aggregated and highlighted in yellow on the Framework 3, which demonstrate Nuit Blanche as Heterotopia (Author's work)

The results from each of the framework, work with the Principles of Heterotopia as suggested by Michel Foucault, and align with the theories discussed, but they also help us verify the utility of these frameworks in understanding any space as Heterotopia. The same methodology can be applied to understand other spaces; then compare and contrast the findings to further develop the understanding of spaces and re-invent new ways to design successful experiences.

Conclusions

Conclusions

Architecture and Design today seems to be concerned largely with our humanity's next great problem 'sustainability' and our integration with the environment. This concern and need to respond to this current situation, has to be met with action, but there is a major issue with this approach. We tend to forget or under emphasize the power that architecture plays in shaping our behavior, our responses in day to day life, our consciousness and in turn dictate our culture. The demarcation of physical spaces, the spatial configurations, what is inside, what defines outside, our communal spaces, and private spaces in an urban setting have a massive effect on the way we see ourselves and also the way we regard our place in society. What it means to live in a cramped studio apartment versus living in an estate house with a big backyard and a lawn with a swimming pool to unwind after a long busy day. The utilitarian functions of design is so obvious in our present day lives that the architecture almost disappears into the background. When architecture or design becomes invisible to us, it's effect good or bad becomes invisible as well.

The new architecture of our time is designed with an effort to accommodate the increasing demands of growing population. In order to match the pace of these rising demands, design is becoming repetitive, lacking diversity in approaches to define the style of architecture. The existing approach to design of spaces is only serving to provide one of the essential and basic human needs of 'shelter'. "The approach is tolerant but messy, inclusive but alienating" says the novelist and video essayist Evan Pushak. This period which we live is basically sort of name-less. As far as my understanding about the style of this era goes, after post-modernism we lost our fascination to associate with 'styles'. The point is not to have a fascination with an existing style from the history and copy paste it to our generation, but to have an ability to design our own style and be remembered as an era which had it's own unique flavour. If there was any time perfectly suitable to lay out a framework create new meanings and experience for our era, it is now. I think with the advancement in technology, the opportunity and our capacity to learn from other fields and apply to architecture and design has never been so fertile. The progress we've made in understanding our neuro-chemistry gives enough clues to re-design responsible architecture that can assist us in our quest for meaning and purpose. The documentation of our rich history can guide us to realize better future which can ensure we continue to be curious and innovative. The lessons of Philosophy written in the past can show us way to break away from our restricted lifestyle and re-invent our designs around our inherent need to explore and make new connections.

Therefore, we need environments which **assist our curiosities** by allowing us to question, and inspire us to push boundaries. Spaces that offer safe environments to express ourselves through art and technology.

We need surroundings that demonstrate our ability to bring order in chaos. Built-environments that **complement our natural environments**.

Understanding of **history and context**, can guide us to realize better futures. Tools and Technology can help further help us to superimpose narratives to enhance the experience by altering stories of existing physical spaces.

I believe my effort to bring together the understanding from the related field of architecture and design, to propose new frameworks for urban experiences suggests a way forward to staging Heterotopic experiences in existing urban spaces.

Fig. 60: Boat as a Heterotopia (Image Source: www.pixabay.com)

This place they say never feels real;
Where the 'otherness' becomes surreal.
Like a Boat floating on water;
They say it can keep you afloat.
Like a Mirror reflecting endlessly;
It will uplift you to alter thoughts.
It's the Garden of Eden with the famous Knowledge tree;
Where Adam and Eve, ate the Apple in curiosity.
It's a Museum that made contexts pointless;
A Library, where information matched abundance.
A Cemetery, where the past haunted present;
Leaving no clue, vanished into absence.
Whenever they felt helpless without map;
This place came to rescue and assured help.
Made them believe in their own strengths;
Crossed boundaries to make new friends.
The senses came sharper in this place;
Making everything inter relate.
Showing new waves of continuing life;
It shared love and offered foresight.
The hope is everyone gets their piece
When this place wakes up from it's daydream

Being realistic if not Utopic
In the future, I pray everything is Heterotopic!
#myredinkpen

Recommendations

Understanding Human emotions and their relationship with the surroundings is an essential part of any design process. A designer is recommended to design to induce positive emotions to foster creativity as creativity is overall rewarding and hence a positive emotion.

Creativity and Innovation are nothing less but abilities to recognize patterns and make new connections, Having this understanding designers can use the proposed research to understand any piece of the puzzle on their journey to design to foster positive experiences by editing out elements that can induce or cause negative emotions.

Since there is always a feedback between Subject or Subjects with their immediate surroundings or Object, their experience is controlled by the properties of both subject and object. Therefore it is recommended to study this relationship before undertaking any design project.

Tools and Technology can assist to influence the effect of any experience. A thorough survey to identify the options available is recommended.

Heterotopia is more of an experience which can be created or staged in any given situation, provided the access to the right tools and technology along with a thorough understanding of the space and its context, regardless of the geographical location.

Next Steps

For the purpose of this research, I studied only a heterotopic space, and hence conducted a survey to document experiences related to heterotopia, but given time and capacity, one can use the same method for variety of different spaces and a larger sample size to compare and contrast the findings. To date the findings suggest the relevance of the tool for this designed purpose.

The proposed frameworks do acknowledge the relationship between various spatial configurations and Human emotions, although the theory of Viewpoints and Compositions; proposed to stage experiences is a general theory to stage almost any kind of experience. Further research can be conducted to understand in detail the effects of each elements of Narratives, Viewpoints and Composition on human beings and therefore derive a methodology to design positive ‘experiences’.

The proposed list of spatial configuration in Framework 1 is only descriptive and not exhaustive, and further research into other types of spatial configuration and their interaction with Human beings can help populate the list and build a vocabulary of spatial configuration in relation to corresponding emotional responses.

My inquiry into the topic of Heterotopia was deeply rooted in Psychogeography and Cognitive architecture, although I do touch upon Ontological design perspectives, but due to the time constraints, and limited capacity, I was not able to study the principles and ideologies proposed in Ontological Design and Situationism Psychology. Further research in these subjects can help validate the application of this framework in related fields of design.

Although grounding my argument based on the framework proposed by Francis Ching in Form Space and Order, I have tried to draw a parallel between virtual and physical spaces to give a general idea and foundation to understand virtual spaces in relation to physical ones, but the study into virtual spaces is still very primitive, with the advancement in technology, this understanding can change or evolve. Further investigation into the design and details of virtual spaces can be useful to advance this research forward.

Knowledge Mobilization

This research will serve as a foundation to guide a project on examining the effects of spaces on human beings, through virtual reality mock-ups in association with Digital Black Magic, a 3D visualization and architectural design studio based in Toronto. The intention is to build a series of spatial configurations based on the findings of this research in Virtual Reality; and further engage with the Urban Reality Lab, in Waterloo under the guidance of Professor Collin Ellard to closely examine the effects of these spaces on human beings. Urban Reality Lab in Waterloo is equipped with the apparatus and technology needed to carry out neuroscience based study and experiments, to take this research forward.

I also intend to engage with a San Francisco based Virtual Reality Studio, run by a dear friend Dhruv Washishth to plan more experiments to validate the findings and fund further research in this area. The next steps proposed in the section above will also serve to guide my further research in this topic.

Further, this research report will be shared with the experts who were interviewed for this research, so that the findings and insights gathered during the research can assist them in their ongoing and future initiatives.

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Appendices

Appendix A

Survey

A survey with a sample size of 25 people from different age groups and genders was conducted to ask participants 4 simple questions related to their experience at Nuit Blanche. The Participants were asked to highlight any 3 emotions that they felt at Nuit Blanche 2016 in Toronto, relate a word which describes closest human tendencies that they thought were being addressed at the Art festival this year also to plot their experience in any two quadrant with associated feelings.

The pictures show a sample survey form filled by one two of the participants. Most responses for the basic human emotions were that of Joy, Surprise, Amazement, Anticipation and Interest. Some people also mentioned excitement, which is a derivative of Joy and Anticipation. The secondary emotions highlighted were that of Awe, Submission and Love. This survey helped in verifying the proposed concept and assumption that such experiences, the ones which had elements from both Imaginary realm and Reality tend to induced positive emotions in people. The human tendencies that most participants underlined were that of Exploration, Expression and Abstraction, some other tendencies which some of the participants highlighted were Orientation, Biophilia and Repetition.

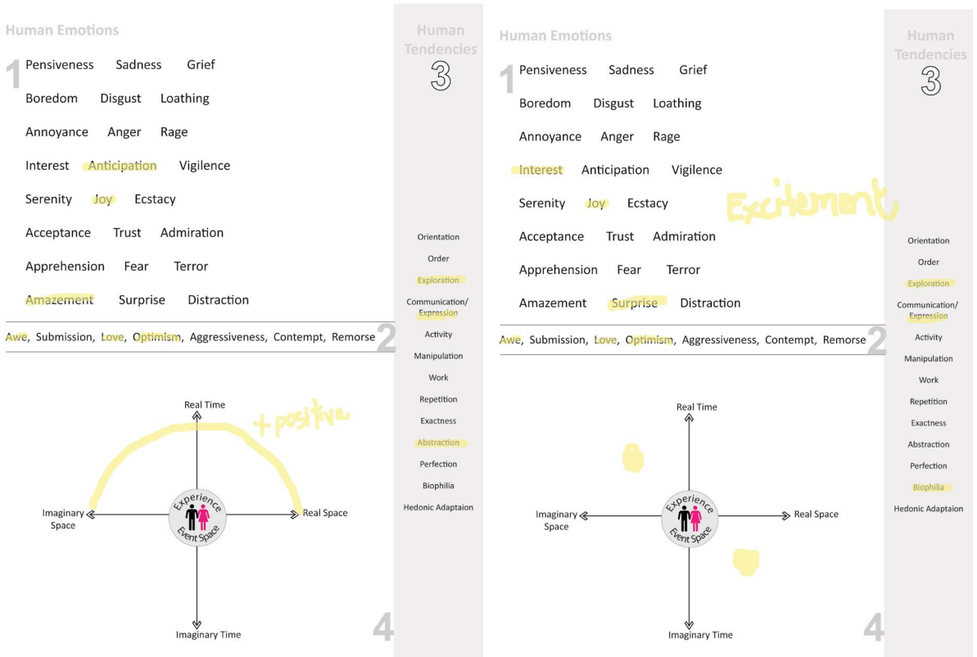

Fig. 61: Examples of survey results (Author's work)

One of the interesting comments from the feedback was from a lady who had attended Nuit Blanche 4 years ago and said that she felt excitement in the beginning before the event, but when she went to the event she felt bored because of "Repetition" and long walks to each exhibit, she stopped going for Nuit Blanche since then, only this year she did attend some exhibits which she liked specially the ones in Nathan Philip square.

Most people were finding it difficult to separate a feeling of Utopia from Heterotopia, some also struggled to isolate positive feeling in Homotopia or reality to Heterotopia. One further explanation of the concept, they found it easy to locate their experience in the quadrants of real and imaginary, i.e. Heterotopia. Out of 25 around 19 voted for their experience to be that of a Heterotopia, whereas the other 6 were a mix of Utopia and Good Homotopia.

This survey was useful to aggregate and evaluate the tool in terms of its application to understand a space as Heterotopia, Homotopia, Utopia or Dystopia along with associated emotions in each quadrant. The alignment with Human tendencies was helpful to understand the purpose or function of the activities being organized.

Appendix B

Cognitive Architecture

Cognitive Architecture by Ann Sussman, Justin B Hollander is highly recommended to any designer or architect interested to take a detail dive into studying the relationship between spatial configurations, architecture and art, and human emotions. It has series of examples illustrating elements and features of architecture and design which can help designers in making informed choices to respond to Human proportions in public spaces to avoid undesirable design choices. One of the interesting examples that I thought was important to include in this report was the proportions of famous public piazzas. Apparently the world famous public spaces followed a strict threshold of 100m radius, for example the Mughal Gardens, at Taj Mahal, or St. Peter's Square in Rome. The reason behind this proportions is our eyesight, which is normally considered to be limited to see clearly only upto a distance of 100m.

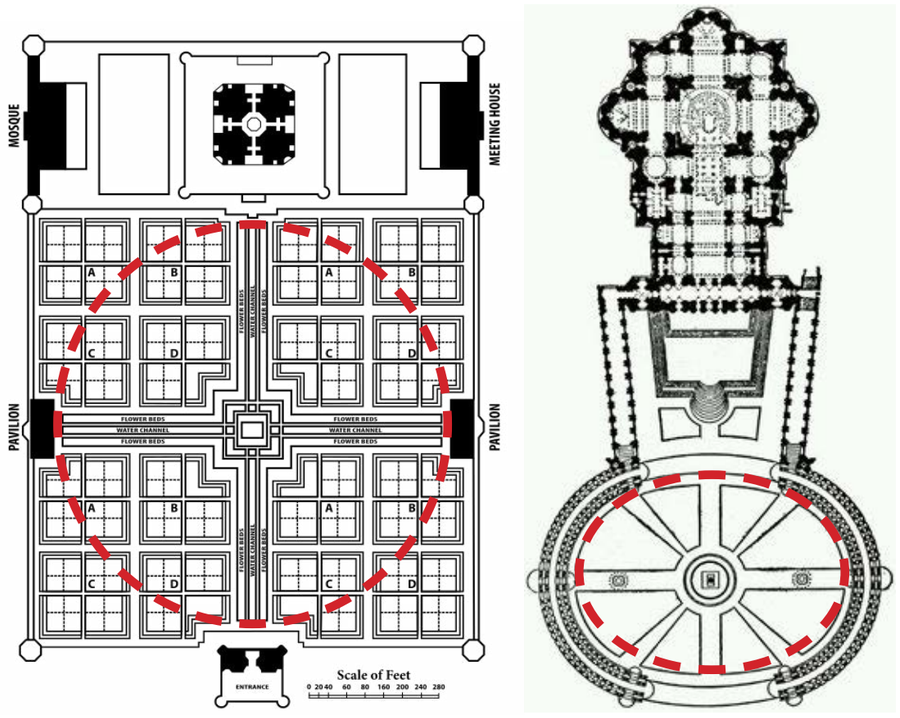

Fig. 62: The 100m threshold is embedded in the plans of many of the world's most famous civic and religious places. From the left, The Taj Mahal Gardens in Agra, India; St. Peter's Square in Rome, Italy. On hundred meters marks the radius length from the plan's central point to its edge. (Image Source: Wikimedia Commons; Illustration adaptation from Cognitive Architecture, Sussman, A., & Hollander, J. B. (2015))

Appendix C

Collage City and Heterotopia

In their book Collage City, The author Rowe and Koetter assert that planners have failed to recognize the "complementary relationship of processes of anticipation and retrospection". In the chapter named "The Crisis of the object: Predicament of Texture" they emphasize on void and function as important aspects of city planning. They pose 3 questions:

1) Why are we compelled to prefer a nostalgia for the future to that of the past?

2) Could the imagined ideal city reflect /allow for our psychological constitution?

3) Could this ideal city function visually as theatre of memory and theatre of prophecy?"

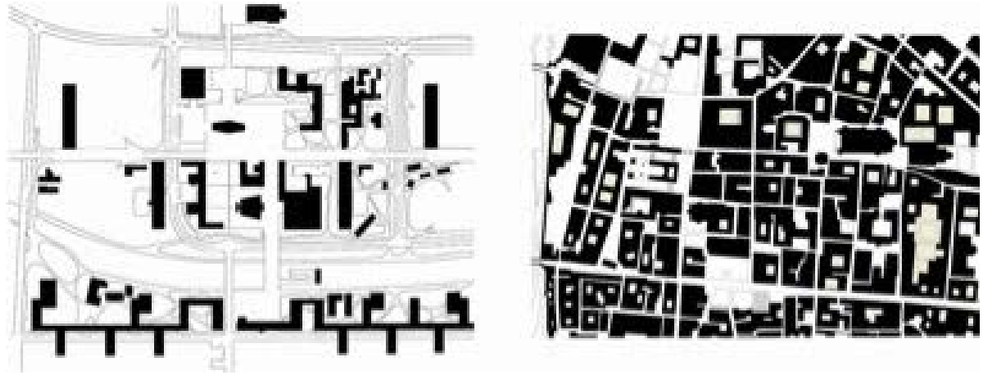

Fig. 63: Typical format of the traditional city on the left compared against the map of the modern city on the right. (Image Source: Adaptation from the book Collage City (Rowe, C. & Koetter, F. (1978))

Rowe & Koetter refer to a metaphor of the garden as a proposal for a new vision for city planning. They regret the loss of the traditional street and consider the significant De Stijl contribution to the textures of the city block. Comparing the typical format of the traditional city with the modern city, they notice a key difference in the plans of traditional city, which is in every way inverse of the modern city plan, looking like 'Gestalt diagram' illustrating the fluctuations of the figure-ground phenomenon. Hence the traditional plan looks almost white whereas the modern city plan is almost black. "The one is an accumulation of solids in largely unmanipulated void, and in both cases the fundamental ground promotes an entirely different category of figure- in the one object in the other space" (Rowe C., & Koetter F., 1983).

They argue that the traditional city have solid and continuous matrix or texture which gives it energy to its reciprocal nature, the space, a resultant square and street act as some kind of public relief valve and providing a kind of legible structure along with a supporting texture of gardens and open grounds. Unlike modern cities where the built form is dominant, here the public façade remains relatively free to act according to local impulse or the requirements of immediate need. The modern cities make you question the relationship between solid and void, pubic stability and private unpre-

dictability, pubic figure and private ground, the built form taking over the public realm demolishing public decorum, affecting the quality of life, hygiene, aspect, air, prospect, recreation, movement and openness.

The Paris project is illustrated several times in Collage City to hint at the real identity of the master-mind urban opponents. The Florentine project also conforms to the emergent 'collage' approach because the structures sit so well with its heritage landmarks in every direction.

They refer to the public buildings of Gunnar Asplund who "attempts to make of his buildings as much as possible a part of the urban continuum". The word 'poche' (or pocket-like building schemes) is used to support the idea that urban 'infill' can enrich the texture of the city and should be utilised by planners. Their comment on Weisbaden is central to the new planner's solution; "allow for the joint existence of the overtly planned and the genuinely unplanned" (Rowe C., & Koetter F., 1983).

They argue that the act of assembling the various components in a city plan is a time based activity and requires an understanding of change as part of the process, 'collage could even be a strategy which by supporting the utopian illusion of changelessness and finality might even fuel a reality of change, motion, action, history.' The authors also suggest that the 'city as museum' has an intellectual life that can only be positive. "They reduce the metaphor-concept of 'museum' into two parts: museum equals scaffold or exhibits/objects are equated with demonstrations. Modernism is accused of ignoring the objects in favour of the ideologies of the 'scaffold'. As a result modern architecture always professes "a distaste for art". The profession is then brought to its lowest point with the assertion that the authors have witnessed an "increasing poverty of meaning and decline of invention". Modern architecture lacks "art". They then produce a mastermind of the modernist movement; Pablo Picasso. The Bull's Head 1944 cast in bronze from a bicycle seat and saddle is a particularly potent piece of sculpture recommended for architects' consideration. It has the integrity of image and object but also has meaning. It is artless yet somehow descriptive, it is style less but yet it is a talisman. It is well positioned for all urban designers to reflect upon and emulate. Then the authors extend their arguments to expound on the eponymous Picasso collage illustrated on the title page" (Canniffe E., 2013).

Rowe and Koetter's propose 'a collage approach' as the "only way of dealing with the ultimate problems of either or both utopia and tradition". One can study the collage approach in parallel with Foucault's idea of heterotopia, so as to find many similarities in both the proposals. Both trying to emphasize on heterogeneity of traditional architecture, highlighting the utility of solids and voids in a cityscape. Role of spaces that allow for reflection and action, by respecting introspection and building upon anticipation, putting human psychology as a guiding light to design city plans. The examples cited in Collage city are very similar to that proposed by Foucault in his transcripts for heterotopia, Museums, gardens with due emphasis on the role of art in public spaces. Collage city as a concept is complementary to support Heterotopia as a means to re-invent and rejuvenate urban spaces. One can read this book to study details and principles of Collage cities and further investigate its relationship with Heterotopia.

Manpreet Juneja
December 2016