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Book Review

Urban Experience And Design, (Org.) by Justin B. Hollander and Ann Sussman, Book Review

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Abstract
This collection of articles, turned into chapters, shows of great significance for the contribution of knowledge about the connection between User Urban Experience and our built environment. In the interception of architecture, planning, design and psychology. Although not specifically in line with the User Experience (UX) writings that blends borders between digital and physical world (such as the works of Don Norman), this book talks about the use of specific technologies and biological interpretations. In some chapters Biometric eye tracking and terms as fixation, saccade and pre-attentive processing will be the foundation for collecting data on urban conditions that respond to innate human needs. We can find insights from neuroscience such as the fact that most of our brains work, happens without any conscious awareness of control (11 billions bits of information from the body per second, conscious brain handle 50 of this bits per second (Mlodinow, L., 2013). Subliminal: How your unconscious mind rules your behaviour. New York: Vintage.) Using eye tracking to create buildings people easily take in is proposed, giving an example how art can perhaps create a positive of urban experience. Face bias, and the relevance of façade, as mammals looking at faces make us feel safe and at our best. We as social species look for relationships all the time (Porges, S. W. (2017). The pocket guide to the polyvagal theory: The transformative power of feeling safe. New York: Norton.).

1 – Structure of the book

The book is divided in: Introduction, 3 sections (I - Historical and Theoretical Foundations of Architecture and Planning; II - Twenty-First-Century Tools Biometrics and Measuring the Human Experience of Place; III - Explorations of the New Paradigm for Urban Experience and Design), and Conclusion.

The table of contents is well balanced with a slight increase of articles on the 3rd section. This collection of articles were done by one or several authors each. The title of the chapters are fully aligned with each section.

2 – Section I - Historical and Theoretical Foundations of Architecture and Planning

2.1 – Sense of Place

On this chapter, Robert S. Tullis, shared a syntheses of a chronological evolution around the concepts of topos (Plato and Aristotle), space and memory (Vitruvius), Alberti's skillful and pleasing composition, perspective (Brunelleschi's), fiction (Piranesi), natural law (Age of Enlightenment), memory and meaning (Ruskin). 'Age of Industry' produced a schism. A good example of this schism is the 19th-century train station, with its historicist waiting room or hotel housing people at the front and facing the square, and its cast iron train shed housing machines at the rear. All of this evolution of

thought about sense of place was radically changed in Europe after the end of World War I, and in America by the end of World War II, by people who found themselves inspired by the 'wrong' end of the train station, if you will.

Because Corbusier's and Giedion's functionalist utopia had failed to materialize by the 1960s despite the great changes that modernism, transportation engineering and functionalist zoning had made on city design and city spaces, some architects in the 1960s and 70s started to re-examine and re-embrace earlier thought. Aldo Van Eyck, for instance, emphasizing human interaction in what seems to be a Giedion reassessment, wrote, 'Whatever space and time mean, place and occasion mean more. For space in the image of man is place, and time in the image of man is occasion' (Carmona, Heath, Taner, & Tiesdell, 2003, p. 98).

In their book Body, Memory, and Architecture (1977), Kent Bloomer and Charles Moore refer to 'a feeling of being bounded, possessed, and centered' within sympathetic buildings, and say that it 'must apply to the city as well if the city is to belong to its constituency' (pp. 54 & 55). They refer to the building as a partner in dialogue, and as a precursor to embodied cognition theory (…) - Bloomer, K., & Moore, C. (1977). Body, memory, and architecture. New Haven: Yale University Press.

Senses are not just receptors, but that they project out to gather experience; they are aggressive, information-seeking mechanisms (Bloomer & Moore, p. 33). This is critically important to their role in a person-place dialogue.

Landscape, sociology, anthropology, environmental psychology and something known as cultural geography. They wrote about a topic they variously called place dialogue, place attachment, place identity and even tropophilia (the affective bond between people and a particular place). In 1981, environmental psychologist Fritz Steele wrote a book titled The Sense of Place, and that term seems to have been firmly in the lexicon by 1994 when well-known landscape scholar J.B. Jackson wrote Sense of Place, Sense of Time.

The period since the 1970's has seen increasing interest in examination of people's ties to, and conceptions of places. This has often drawn on 'phenomenology' which … aims to describe and understand phenomena as experience, wherein human consciousness takes in 'information' and makes it into 'the world.' Thus, while the meanings of places are rooted in their physical setting and activities, they are not a property of them, but [rather] of human 'intentions and experiences.' Hence, what 'the environment' represents is a function of our own subjective construction of it.

The chapter ends with reference to Place and Placelessness (1976) as one of the earliest phenomenologists to focus on the experiential sense of place. Relph argued that 'however "amorphous" and "intangible," whenever we feel or know space, it is typically associated with a concept of "place"' (Relph, p. 8). For Relph they say, Kevin Lynch's definition of individuality of place, merely acknowledges that each place has a unique address, without explaining how it gains identity. Relph argues that physical setting, activity, and meaning constitute the three basic elements of the identity of places. Sense of place doesn't reside in those three elements, but in the human interaction with those elements.

It concludes by sharing the idea that our urban public spaces are, in fact, a theater for human events and where people come together on a social and civic basis, importantly different from our relationships within private buildings. This public realm should be composed as thoughtfully as the buildings that form it and should not be simply the residual area left over when the design of the buildings is done. We should employ strategies that follow a human-centered recipe that attempts to transform space into place. This recipe is not magical or mysterious. It's actually well researched and time tested, and now it's being validated by brain research.

While we await a neuroscience-based revision of Der Städtebau or A Pattern Language, perhaps we should all become more aware of this scholarship, for decades ignored or marginalized in design schools. As James Kunstler observed in his book The Geography of Nowhere (1993), 'The culture of good place-making is a body of knowledge and acquired skills … if it is not transmitted from one generation to the next, it is lost.'

2.2 - Classic Planning

With subtitle The Power of Beauty for Human Architecture and Planning by Nir Buras. The chapter starts with the question: What Is Classic Planning?

The Art of Classic Planning: Building Beautiful and Enduring Communities (Harvard University Press, 2019) demonstrates that holistic principles, embedded in the classical method, have been used for 5,000 years in a spectrum of scales, ranging from urban fabric to intimate interiors.

Like the alphabetical system that was codified some 2,500 years ago, the aesthetic tools of the classical method were similarly codified at that time, and continually applied and improved upon since then. This occurred most notably during the Renaissance and Enlightenment, and most lately in the 1850s by Haussmann in Paris and Frederick Law Olmsted Sr. in the US, as well as in the early 1900s by Burnham in the US and Forestier in Europe and the Americas.

The classical method is in fact based on understanding that nature, people, cities and buildings are holistic entities. They thrive or fail based on holistic principles. Classic planning is founded on the notion that the substance of cities is complex, and if they are to work, their plans must be simple.

Radically, but not surprisingly, it concludes that the purpose of urbanism is to build a legacy of beautiful places. Biometric research into our brain architecture validates its design templates, which were devised and improved over millennia (Kawabata & Zeki, 2004; Ishizu & Zeki, 2011; Zeki, 2003, 2016). That is because classic plan places are for people. Their human scale, charm, walkability and variety result from knowing that in the last 50,000 years humans haven't changed much.

Based on 'what works,' classic plans provide durability, thereby promoting urban memory. Focusing on practicality, user experience and successful precedents, this type of planning minimizes, if not eliminates, many if not most fatal flaws from the process.The classical method is founded on a knowledge base, a 'cloud of ideas,' which features urban paradigms, building architypes and street, plaza, park and infrastructure components. It directs how to appropriately wield imitation, invention and judgment for the successful application of precedents. This method helps capture and amplify the good qualities of a context and its sense of place, the so-called genius loci.

Town and country balance can be systematically accomplished by inserting or deleting urban fabric and country in the existing matrix, defining the edge of the built fabric and organically reverting areas to country as needed. Seeking the long-term equilibrium of environmental sustainability, social equity and economic efficiency in cities is analogous to living systems seeking homeostasis (Ryan, 2012; Shane, 2005; Clark, 2003; Buras, 2019).

Defined by the International Ergonomics Association (2000) as being concerned with how mental processes such as perception, memory, reasoning and motor responses affect interactions among humans and other actors of a system, the field of cognitive ergonomics studies, evaluates and designs how tasks, jobs, products, environments and systems intersect with humans and their cognitive abilities. While the field focuses on such topics as decision-making, skilled performance, human-computer interaction, human reliability, training, work stress and mental workload, cognitive ergonomics investigates cognition in work and operational settings, to which we can now add research in the cognitive ergonomics of the experience of town and country.

The author concudes with the idea that although traditional design and classic planning are proven to provide the best spectrum of architectural, urban and countryside experience, most designers are incapable of prescribing them (Curl, 2018; Sussman & Chen, 2019).

The classical method provides a unique platform for the discussion, design and evaluation of the built environment. At its core is the measurable experience of beauty. The method fosters both durability and long-term adaptive reuse, and its understanding of the homeostatic balance of town and country provides a known, successful approach to addressing the human–nature dichotomy in the human-made environment.

Perhaps the way forward for the future is a new respect for the relevance and reliability of the design and construction practices of the past. To design for human health and well-being in our built environment, we recognize that we are not 'modern' at all. In fact, we are ancient, built and programmed organisms of high-level consciousness.

There is no good urbanism without good architecture, and traditional and classical buildings make the best streets and places. We have to use modern science to reveal that power of the past. In the end, it is cheaper to plan for the long term than to pursue planned obsolescence and innovation for its own sake. If we don't know where we've been, we won't know where we are going. Not knowing history, we will 'make history' simply by repeating our mistakes again and again.

The historic methods described here are how we built cities before planning ruined them. It is the humane alternative to the dystopias often projected by today's planners. It balances town and country to reflect the magic of place and helps create a legacy of beautiful places. Driven by community aspiration, and sustained by durable construction, classic planning uses the shapes and proportions that best suit human biometrics, perception and thriving.

2.3 - Bonding With Beauty

The Connection Between Facial Patterns, Design and Our Well-Being by Donald H. Ruggles and John Boak.

The chapter starts with a critic of Bauhaus. When Walter Gropius, along with several other individuals, initiated the Bauhaus school in Weimar, Germany, in 1919, he did so with the clear intent of fomenting a revolution in thought and craft of art and architecture. European society at that time was under extreme pressure to rebuild after WWI. New, more efficient methods of construction and design that eliminated time-consuming details were created to aid in the recovery (Wikipedia). Deemed superfluous and unnecessary, many elements of beauty were stripped from the built environment. This simplified architecture was also influenced by veterans affected by PTSD, who, frequently suffering from blurry vision as a result of trauma's impact on their brain, struggle to process visual stimuli (Trachtman, 2010).

The author radically assumes that, thus, the anti-beauty culture of architecture was born. Beauty was being redefined as functional, spare and structural. Aspects that appealed to the human soul were deemed irrelevant and not to be held in high esteem.

Architecture had long utilized nature and the human form to create shapes, details and proportions. But Bauhaus teachings declared those ideals to be no longer valid, thus neutralizing thousands of years of thought and wisdom born of continual experimentation.

To quote Gropius, 'A modern building should derive its architectural significance solely from the vigor and consequence of its own organic proportions. It must be true to itself, logically transparent and virginal of lies or trivialities' (Gropius, Shand, Pick, & MIT Press, 1965, p. 82). Peter Behrens, who taught Gropius and set him on his path, was even more strident, 'Design is not about decorating functional forms—it is about creating forms that accord with the character of the object and that show new technologies to advantage' (Behrens, circa 1910).

These are some of the questions made by the author: Could what we had been taught in our modernist education be incorrect? Should we be looking in the opposite direction and embracing humanistic forms in architecture? There seemed to be some important forces at work here. Could it be that beauty recognition, history and intuition all emanated from this pattern? This initiated my slow and steady investigation of looking into facial patterns, three-by-three patterns and their application to beauty. Research has shown there is a facial pattern infants prefer. This pattern bears a remarkable resemblance to a three-by-three pattern. The author hypothesis here is that the three-by-three pattern was intuitively developed over thousands of years as a result of the facial pattern-recognition skill that all humans are born with. This geometric pattern is a representation of a parent's face, and the face represents the empathic bonding that happens between parent and child providing pleasure and love and safety.

At birth, 65% of the neuronal structure of our brain is dedicated to facial recognition. Over half of our structural mental capacity is given to facial pattern recognition (Granrud, 1993). 'Faces are among the most informative stimuli we ever perceive: Even a split-second glimpse of a person's face tells us their identity, sex, mood, age, race and direction of attention' (Tsao & Livingstone, 2008). This visual information allows us to conclude certain things about a person's identity without actually knowing anything about them.

Psychology Professor David Perrett writes, 'Our constant, intense, and rewarding exposure to faces means that faces acquire a prominence and a significance for us that no other object can match' (Perrett, 2012, p. 52).

Bottom-up processing is based on circuitry that is inherent in our brain. It is essentially innate, intuitive knowledge that initiates the emotion. The processing is governed by universal rules that are built into the brain at birth by evolution, and it enables us to extract key elements of images and patterns in the physical world, including intersections, contours and the crossing of lines. So, the push-pull isn't just between approach or avoidance; it is also about intuition and cognition.

This is an important point because a newborn child possesses minimal accumulated information; therefore the intuitive, born-with emotions govern their actions. Bottom-up processing wins out and the innate drive for pleasure and food becomes the determining factors that foster bonding.

Professor Harry Francis Mallgrave stated, 'Beauty is a neurological activity, an urge for and feeling of pleasure emanating from the brain's lowest or most primal reaches and associated with awe or wonder.' He also said, 'In this regard, we judge certain forms to be beautiful because they in fact mirror the basic conditions of organic life' (Mallgrave, 2013, p. 51).

The famous Scottish philosopher David Hume said, 'Beauty is no quality in things themselves. It exists merely in the mind, which contemplates them; and each mind perceives a different beauty.' From this originates the common refrain, 'Beauty is in the eye of the beholder,' which is a top-down statement (Mallgrave, 2011, p. 42).

Symmetry conveys a sense of health, well-being and solidity. In the analysis of iconic art and architectural works worldwide, symmetry plays a major part in the anointment of a work as a timeless and iconic beauty. I believe the less symmetrical, the less likely for the composition to be judged beautiful.

The singular message is that the three-by-three pattern results in triggering the sequence of curiosity, reward and pleasure that activates the hormonal system, which results in the feeling of pleasure and the acknowledgment of beauty. While proportions are important, without the presence of one of the fundamental patterns, curiosity is not initiated and the sequence is interrupted. Should the lack of the fundamental pattern be replaced by an unfamiliar pattern that generates high stress in the observer, then the reaction is likely to be a sympathetic, adrenalized reaction that activates the fight-or-flight reaction for survival and avoidance.

The author research shows it is pleasurable because it stimulates our brains to initiate the hedonic outflow pathways of our neuronal structure, releasing the hormone endorphin. These pathways are the result of empathic love that occurs during neonatal bonding. This feeling of pleasure results in the top-down proclamation, 'It's beautiful.' It is a bottom-up emotion ignited by the single ancient pattern that humans have known for all time: a geometric representation of our facial pattern, the three by three.

In summary, beauty is a physical reaction to a pattern that conveys the emotion of pleasure. Pleasure that is generated by this simple geometric scheme is one of the fundamental keys in the theory of beauty. This is why I choose to illuminate these concepts and propose a path forward to help architects and designers create ways to cut stress and improve people's health while also building a more beautiful world.

2.4 - Neuroscience experiments to verify the geometry of healing environments

On this chapter, Nikos A. Salingaros, proposes a Biophilic Healing Index of Design and Architecture.

It starts by introducing that the human body is hardwired to prefer being surrounded often by living

things, as well as with artificial things that unconsciously remind us of organisms. Biophilia—the love of living structure—is a natural consequence of our evolution (Kellert, 2018; Kellert, Heerwagen, & Mador, 2008). This strong association is visceral, not intellectual, and it consequently affects our physiology and health. By implementing mechanisms responsible for this innate connection, design that is biophilic is felt as more natural and comfortable than are alternative geometries incompatible with biophilia (Ryan & Browning, 2018; Ryan, Browning, Clancy, Andrews, & Kallianpurkar, 2014; Salingaros, 2015, 2019).

Tools for achieving biophilic design create a positive emotional/physiological state that helps to boost the body's own defense mechanisms (Joye, 2007a). Long-term advantages are cumulative. Stress-reducing surroundings (which biophilic design helps to create) are therefore healing. For millennia, people used their instincts to adapt the geometry of the built environment so that it was healing to everyone who experienced it.

A healing environment does not wear us out psychologically. It's the opposite of one where the geometry alarms us; where we have to deal with constant ambiguity, fear and stress triggered from surrounding components. Using this understanding, we can predict healing effects of specific environments before they are built—yet this secret is unknown to most contemporary architects. A 'biophilic healing index' (defined later) estimates how far an environment reduces stress. It thus helps to implement a robust scientific approach to assessing architectural projects in an objective manner that contrasts with decades-old judgments based on dubious aesthetics (Boys Smith, 2018). A massive experimental program needs to discover and support the health effects of environmental geometry. The reason is that design decisions taken today will determine our future health and well-being. How the built environment's geometry affects the human body is a major, though woefully neglected, public health issue (Ruggles, 2017). During the past century, harmful environmental effects due to geometrical stimuli that produce anxiety were routinely ignored. Incredibly, this global effect hasn't caught the interest of the medical community (other than in healthcare environments; and even there, not in any systematic manner).

Design tools for achieving healing environments are already known to researchers outside dominant architectural culture but are not yet part of the public consciousness. Hopefully, new results can help trigger a historical paradigm shift in how humankind shapes the earth.

This chapter classified physiological effects that reduce stress and are triggered by different geometrical and visual features in our environment. They are individually identified as 'biophilic healing factors.' It was explained how each of those factors could be increased (leading to positive healing effects) or decreased (leading to increased stress and lowered health potential) by design. A useful overall measure combines all of those effects into the 'biophilic healing index,' a number from 0 to 20. Although this is a new model, traditional and vernacular architectures automatically sought a high index.

3 - SECTION II, Twenty-First-Century Tools, Biometrics and Measuring the Human Experience of Place

3.1 – Identifying biophilic design elements in streetscapes

Peter Milliken, Justin B. Hollander, Ann Sussman and Minyu Situ, wrote this chapter about a Study of Visual Attention and Sense of Place.

Natural elements have reason to be included in design aspects for all areas of human interaction. Maintenance usually plays a factor in discouraging implementation of these elements, even though residents of towns utilizing green infrastructure over other transportation elements have been shown to support and accept the maintenance costs (Sikorski et al., 2018). Biophilic elements can then be applied over all parts of the urban fabric, including transportation.

Biophilia is a theory introduced by E.O. Wilson (Biophilia, 1984) valuing the human–nature interaction and describes the innate, human affinity for nature. Studied in many ways over the past decades, researchers have built upon Wilson's (1984) and Kellert's (1996) initial descriptions of biophilia. Research supports the influence of biophilia on people who experience biophilic attributes and elements in everyday life. Street trees, bioswales, green roofs and other elements

of foliage together represent one type of attribute of biophilic elements. Injected into urban regions, biophilic attributes create opportunities for communities and the public to engage with nature, gaining demonstrated benefits to their well-being.

Key concepts of this research revolved around the following question: What biophilic elements of streetscapes are in urban spaces?

Field research was conducted to provide a way of understanding current conditions in Devens. Photographic research will provide an opportunity for deeper, visually focused analysis. Combined, they will provide an understanding of the conditions of streetscapes in areas of Devens. Opportunities for improvement could also be highlighted.

All images of streetscapes were analyzed with 3M's VAS (Visual Attention Software), which emulates eye tracking, a biometric tool that maps the path the human eye takes taking in its surroundings. This will provide reports of where the eye fixates when observing the streetscapes, how the eye tracks across it visually, and will highlight different visual aspects of the streetscape ('Visual Attention Software', 2019).

To summarize, this study will be looking at the different regions of fixation and the different sequence points of fixation for 28 different image orientations or positions at different locations within Devens. The number of regions and red regions in each photograph position will be counted and compared with the number of total biophilic attributes and elements identified within the location. This is because when visiting a location, all attributes and elements may be experienced, but different positions will be experienced in different ways. The fixation points within the sequence report will also be analyzed in a binary nature to simplify whether biophilic elements could be identified to increase fixation probability. This is sufficient for this study since it is not comparing biophilic elements to each other but identifying how the elements and attributes themselves may increase the fixation and attention garnered by a location. Photos of Devens were collected and data was gathered regarding the different qualities noted in the visualizations and reports. Counts were made of the number of different biophilic attributes initially observed at the locations in the focus areas noted by the VAS software. What was also noted was whether the focus orders for each image started and ended on biophilic attributes.

The observed attributes noted throughout Devens and the study locations in particular were attributes of color, plants, light and shadow, spaciousness, prospect and refuge, reflected light, avoiding placelessness by providing some sense of order and complexity. Each of these attributes were present in some combination. VAS emulation suggests observers would fixate at more positions within a location when more biophilic attributes are present.

The role biophilia plays in streetscape design is apparent in this research. The findings represent how biophilia can influence the human experience within the streetscape and how eye-tracking emulation software can be a useful tool to measure such influence. Biometric tools, such as VAS, are useful for helping us better understand the human experience in a larger context for urban planning. It could be used to identify characteristics of urban settings that people are attracted to, as well as test if replications of these characteristics yields the same results across an urban fabric. Biometric studies provide a new language, where words like fixations and pre-attentive processing enter the urban planners' lexicon to promote better placemaking and enable more accurate assessments of existing or planned communities. The study also supports using or highlighting biophilic streetscapes in settings to improve the attention a user may give to their surroundings. The study does not give validity to statements regarding how the introduction of biophilia may improve health, well-being or interest surrounding an area in either an urban or a suburban environment.

This VAS study only examines visual stimuli and how they influence a viewer's fixation when observing a space. Considering others may be negatively influenced by olfactory or auditory stimuli in a location, visual stimuli could be overshadowed by other features. Some biophilic attributes contribute to these alternative sensory stimuli, but the use of these attributes would be

dictated by the characteristics of the space. Surveying viewers and occupiers of the space would also give the opportunity to see what elements and attributes they focus on within the space or location. This would give greater context to the experience of the space, especially by those who may use the space frequently. After identifying some of these characteristics, it would also allow the inclusion of attributes involving relationships between the human and the place. These characteristics are difficult to establish without verification. Identifying the different sensory experiences in the locations could also be informed through surveying.

This study makes an important contribution regarding research of humans, nature, the relationships between them and how designed spaces can help institute those relationships. As development patterns progress and design aesthetics change, it is important to reflect on how the human relationship to space is influenced, enhanced or controlled. Biophilic elements, from this study, should be shown to have a place in this area of study. More can always be done to study how humans react to spaces and how spaces react to humanity, as well as the role nature plays.

Future studies could be extended to other areas where biophilic elements could be included. Design studies could look at how biophilic elements are used in architecture throughout cities and how this influences residences' opinions and behaviors in ways they may not realize. Transportation planners could use this study as a way to look at how utilizing these design elements may influence focus or attention at intersections or around bus shelters offering important insights on how to enhance safety and wellbeing in the public realm.

3.2 - Exploring eye-tracking technology

Assessing How the Design of Densified Built Environments Can Promote Inhabitants' Well-Being is the subtitle for the chapter wrote by Frank Suurenbroek and Gideon Spanjar. The fundamental physical conditions of open spaces in the built environment are shaped by the orientation and appearance of adjacent buildings. In the past, urban compaction gradually took place from the core of the city, where open spaces were perceived as 'undeveloped' land designated for new buildings. Most of the remaining large open spaces were covered by green, whereas others were initially designed for transport. Today, open spaces need to deliver a valuable contribution to human well-being in multiple dimensions. The physical configuration of streetscapes impacts users' experience and behavior and, in turn, their perception of place. For centuries, Western European cities expanded horizontally with low-rise housing development and new business districts on the urban edge. The network and dimensions of streets retained a human scale, which enabled people to walk and eventually allowed for combined use by pedestrians, carriages and cyclists.

This changed in the second half of the 20th century, after World War II, when in Western Europe the automobile became affordable for the lower-middle class and there was a tremendous shortage of affordable housing.

Throughout the second half of the 20th century, various design theories attempted to formulate design principles to create a human-scale streetscape. Those theories had a great impact on design practice but did not establish relations empirically. Allan Jacobs of MIT, for example, spent more than 20 years researching the applied design principles of the classic 'great streets' and boulevards. Jacobs's research concluded that there is no standardized set of design ingredients that guarantees the construction of a physical space that people appreciate and where they will linger (Jacobs, 1993). Like other influential studies by Jane Jacobs (1961), Venturi, Brown, and Izenour (1972), Lynch (1960), Banerjee and Southworth (1990), White (1988), Cullen (1961), Alexander, Ishikawa, and Silverstein (1977) and Gehl (2011), Jacobs managed to steer the architectural debate away from the modernistic top-down perspective that we saw applied in the Bijlmermeer, toward the human scale as the leading perspective. In general, the key design principles that give environments a human scale include, at minimum, the following principles:

- Active ground floor: a portion of the first floor is transparent due to windows, doors and functions. This creates a relationship between the inside and outside and establishes a sense of ownership and transparency.

- Ornate façades: (perceived) differences, variations and rhythms of buildings in height and width. Facing the

street, these differences create rich visual context, offer enclosure and provide guidance for pedestrians.

- Tactility: Using 'tactile' surfaces for the skins of buildings, the pavement and the street design provides a texture, with an eye for detail and scale, stimulating fixation and engagement between streetscape and viewer.

Conceptually are presented, bodies of research demonstrating the effects of the built environment on humans and the way this might be measurable by brain activity and stress levels.

This chapter explored the application of eye-tracking technology in urban design to gain a deeper understanding of the physical-behavioral interrelationship of streetscapes in European high-density built environments.

Experiment 1 took place on location, in the 'old' high-rise district of Bijlmermeer where urban renewal is taking place. Experiment 2 was conducted in a lab setting, using photos of Dutch streetscapes in high-density environments. The preliminary results suggest that the assessed design principles 'Active ground floor' and 'Ornate façades' might be important factors in predicting dominant eye patterns. 'Tactility' appears to be a more subtle design principle. All of these design principles need further investigation. Moreover, eye-tracking research needs to be supported by additional social research to fully identify the observed eye patterns and to investigate the effects of the visual experiences on users' behavioral changes and derived place perception. Assessing the visual experience of a multitude of (high-density) built environments and using contrasting locations where design principles are present or absent may help to analyze the patterns. Thus, this pilot study shows promising preliminary results but also reveals a range of methodological issues that appear to be related to the complex transdisciplinary nature of the field of neuro-architecture.

Although the sample sizes need to be larger to validate the design principles, the pilot study suggests the potential of eye tracking for urban design practice. Yet, this conclusion touches upon a more fundamental question that needs to be answered: Does the new hybrid field of neuro-architecture aim to articulate generalizations that can be implemented in any given high-rise environment? Or are we searching for situational evidence about certain relationships between 'designed space' and 'perceived space'?

It might be both. The design failure of the Bijlmermeer that has been described, where modernistic principles were fully applied, disregarding cultural context, emphasizes the importance of situational evidence about certain relationships between design space and perceived space. The urban design principles had a radically different take on human scale and elementary physical-behavioral interrelationships that contribute to human health and well-being. The two experiments demonstrate that the valuable combination of emerging technology and theories from neuroscience and architecture offers to unravel the complexity of cognitive responses to the built environment. It allows us to assess and match common design principles according to the (visual) experiences of streetscapes and to start formulating biometric guidelines to work toward healthy and livable high-density environments across the globe.

3.3 - Attention and focus in the perception of Persian architecture

This research of Saeid Khaghani, Jamal Esmaeilzadeh Vafaei and Seyed Behnamedin Jameie, by examining the patterns of Persian architecture and measuring the subject of attention in five different Persian architectural sites, indicated that patterns including symmetry, formal composition, spatial hierarchy, color and ornamental emphasis attract bottom-up attention. These findings reemphasize the basic assumption that the human mind is more interested in these patterns. The interesting discovery of this study was that the point of attention and the interest matched. In addition, it showed that certain patterns build stronger and memorable perceptions of the buildings while other parts and details are ignored.
The fact that a significant number of visitors with different cultural backgrounds chose symmetrical forms, with simple yet strong compositions, showed that the human mind tends to have common principles in perception and attention. Despite the fact that subjective and conscious presuppositions have a significant

impact and can influence perception, in all cases, after a short acquaintance with the place, common rules and principles prevail in peoples' perception and judgment. This study showed that under a layer of changing tastes and time, principles guide our approaches to the outside environment. It calls us to put energy into finding commonalities for building better environments rather than only focusing on differences and changes in the name of creativeness.

For future studies in this area, in order to reach more reliable and scientific results, new methods in neuroscience can be applied in architectural perception. At the moment it is hard to come up with new features such as fMRI imaging, because information about the function of the mind is not yet fully understood. However, there are many ways that this can be achieved through eye-tracking experiments and mental performance recordings. This research was only a preliminary step and can take on new approaches for more detailed and stronger results.

4 - SECTION III, Explorations of the New Paradigm for Urban Experience and Design

4.1 - Cognitive mapping, mobility technologies and the decoupling of imageability and accessibility

Andrew Mondschein (author of the chapter) wrote that as the 21st century progresses, the human experience of travel is becoming less cognitively active as information technologies (e.g., GPS-based navigation) permeate travel decision-making and vehicle automation (e.g., driverless cars) becomes increasingly likely (Offenhuber & Ratti, 2013). I ask whether information and automation technologies will reshape urban spatial knowledge and imageability, and if yes, are these changes likely to have significant effects on accessibility? Drawing on spatial learning theory, I use a cognitive mapping survey completed by Los Angeles residents to estimate the effects of increasing travel choice 'passivity' on spatial knowledge at local and regional scales (Mondschein et al., 2010; Münzer, Zimmer, Schwalm, Baus, & Aslan, 2006). I examine differences in spatial knowledge by travel mode, controlling for other factors, finding diminished knowledge among passive travelers. Based on these findings on the effects of passive travel on spatial knowledge and accessibility, I propose four effects that will increasingly separate travel experience from imageability: reduced control over mobility, elimination of wayfinding, diminution of destination choice and distraction from urban stimuli.

Beyond the immediate concerns of transportation planners, all urbanists concerned with how we derive meaning from cities can be concerned by the increasing erosion of the link between travel, activity and imageability. Cities are the product of collective human effort that becomes less evident in an automated, distracted world. We don't yet understand the implications of this change for how we understand place attachment, social connection or even local democratic action. Kevin Lynch and his collaborators always suggested that imageability was not just a matter of designing and building a legible city, but also of engaging inhabitants in the conscious effort of understanding and engaging in the world around them (Carr & Lynch, 1968; Lynch, 1960). In the coming years, planners, designers and others must ask themselves whether we should seek to retain a role in this human process, or whether mobility becomes fully a matter of getting from A to B, without a relationship to a human experience of place.

4.2 - Emerging transport futures for streets and how eye tracking can help improve safety and design

Kevin J. Krizek, Bert Otten and Federico Rupi wrote that new forms of transport technology help people move about cities, an important issue is emerging. Users of existing and emerging transport modes are diverging in their need to pay attention while on the streets; as a result, safety is at stake.

This burgeoning line of investigation has implications that could be significant. It can help address an emerging public health crisis, at least for American urban streets. While over 30,000 people die in car crashes in the US each year (Wikipedia, 2020), in 2018, pedestrian fatalities in the United States, which are included in the totals given, reached a ten-year high of 6,277—more than a 50% increase from a decade earlier (Schmitt, 2019). In the EU, pedestrians and cyclists comprise around 21%

and 8% of all road traffic deaths (European Road Safety Consortium, 2018). Pinpointing what's responsible for this increase in calamities is challenging. Our point is that eye-tracking research can help understand key factors underlying what threatens people's safety. Eye-gaze research has utility for understanding the attention of drivers, too (e.g., designs that allow them to zone out and focus only on traffic signals).

Such research could also help improve design and placement of signage. Sometimes there are conflicting demands for the visual system—e.g., overhead street signs as opposed to indications on road surfaces (Auffrey & Hildebrandt, 2017). Knowing how to best address these type of design issues and more has countless benefits. Traffic on the streets, by whatever mode, has system properties that go beyond the movement control of an individual. The effect of a single incident cascades within one or two seconds into the pattern of movements of the others. These issues may, for example, be inherently tied to design characteristics and placement of signage at or approaching an intersection.

Certainly, more than a few challenges lie along this investigative line (Kiefer, Giannopoulos, Raubal, & Duchowski, 2017). Getting test subjects into a functional flow with mixed traffic conditions—all while wearing an eye tracker on their head and being monitored by scientists—is one challenge that some research efforts have shown successfully to overcome (Rupi & Krizek, 2019; Trefzger, Blascheck, Raschke, Hausmann, & Schlegel, 2018; Vansteenkiste, Cardon, & Lenoir, 2013; Vansteenkiste, et al., 2014). Travelers on human-scaled vehicles are simply inundated with countless sensory inputs; ensuring accurate studies that control for many confounding issues stresses the importance of employing strategic research designs.

Efforts to better understand how and why things on the streets undermine users' comfort levels are essential. Given that the functions of streets will likely change with technological advances, knowing more about the factors that trigger movements and reactions of people, either implicitly or explicitly, is crucial. Importantly, it may also increase understanding of how people handle other complex navigational tasks in their surroundings.

4.3 - Ecoempathic Design

Misha Semenov chapter is about Moving Beyond Biophilia With Brain Science. Misha wrote that we live today in cities that are fundamentally disconnected from their natural ecological systems. Rivers are hidden in pipes underground, wetlands are paved over and most urban residents are hard pressed to name a local bird or plant species, leading to major environmental issues on both a local and a global level. Meanwhile, the cost of natural disasters and risks associated with careless development continues to rise. The ecological crisis our species faces demands that we act quickly to rebuild our cities in a more symbiotic relationship with nature.

Over the last few decades, city planners and architects have tried to restore balance in this relationship by 'greening' cities and buildings. Green building has become a multi-billion dollar industry, while green infrastructure in cities has increasingly been embraced as an effective strategy for mitigating urban heat island effects, filtering and delaying stormwater runoff, reducing building energy use, providing habitat for key species and improving air quality (Grant, Manuel, & Joudrey, 1996; Thurston, 2006; Escobedo & Nowak, 2009; Arnold & Gibbons, 1996). Strategies such as onsite energy generation, water collection and recycling, ultra-efficient building envelopes, green roofs and walls, bioswales, constructed water filtration wetlands, bird-safe façades, impermeable surface conversions and urban tree planting projects are increasingly prevalent in both practice and legislation.

Despite this potential, as our buildings are automated and standardized for environmental performance and cities invest in ecological infrastructure based on parameters and metrics, there is an important element largely missing from the discourse: the experience of human beings! A look at a stereotypical LEED project (Figure 10.1) reveals how unengaging ostensibly environmentally performative buildings can be, their green technologies hidden from view behind sleek glass façades uninviting to the passing pedestrian. Shockingly, there are no 'points' given in the LEED green rating systems for cities and neighborhoods for how well or poorly they engage occupants in the green systems' ecological performance.

To address this missing link in the green architecture agenda, it is urgently necessary for the profession to build a framework for measuring, predicting and designing for emotional responses to buildings and building systems. The marketing, automobile, entertainment and tech industries are already pouring billions of dollars into quantifying consumers' emotional reactions to their products. Increasingly sophisticated sensors examine users' facial muscles, sweat glands, heart rate, breathing patterns, eye movements and brain waves. If designers of buildings and urban spaces can figure out a way to predict degrees of attachment and fixation to key features before construction begins, designers can get the highest return on investment out of green buildings. Using such a framework, green architects could test whether their designs encourage occupants to use stairs rather than elevators, recycle their waste or reduce water use. Such a setup for testing and ranking designs based on neurological principles could conceivably be one day just as important as an energy use intensity rating or a Fitwel score. The research conducted by Sussman and Hollander using several of the new technologies is only the tip of the iceberg.

The first step would be to include emotional attachment assessment within an existing green building rating system such as LEED and WELL (a LEED pilot credit for emotional attachment is an important future endeavor for several of the authors in this book). Eventually, corroboration of virtual reality data with actual measurements from completed buildings can help to create a powerful predictive model. In no way would such a model be a constraint on creativity; on the contrary, greater empirical knowledge of neurological interactions with buildings will be a powerful addition to architects' design toolkit, expediting the design of a more humane built environment and nurturing a more ecologically aware culture.

4.4 - Exploring urban form through openstreetmap data

On this Visual Introduction, Geoff Boeing, shared that new technologies have recently changed how we can see, understand and plan urban form. Cognitive science and biometric tools such as eye-tracking technology help researchers study human psychological and physiological experiences in the built environment to advance evidence-based urban design (Sussman & Hollander, 2015; Sussman & Ward, 2016). New spatial information platforms allow urban scholars and practitioners to explore the patterns, textures and connectivity of the urban fabric—while empowering public participation and engagement (Boeing, 2018; Evans-Cowley & Hollander, 2010). Meanwhile, the Smart Cities paradigm of urban governance seeks to monitor and control cities via ubiquitous sensing and automatically harvested data, both to track how humans move through space and to respond to their behavior (Albino, Berardi, & Dangelico, 2015; Batty et al., 2012).

Yet too often, urban technologies are used merely for top-down monitoring, optimization and control. Rather than just considering urban livability as a naive optimization problem, city planners could instead use big data to enrich socio-political processes of community advocacy, consensus-forming and public decision-making (Goodspeed, 2015). Or, planners could use new data and tools to investigate sampling biases in user-generated content, adjust for overrepresentation of certain groups and foreground the social experiences of marginalized populations (Boeing, Besbris, Schachter, & Kuk, 2020; Kang et al., 2019). User-generated spatial data can even help us introspectively unpack planning and design histories and the spatial logics they manifest, which in turn shape human behavior and experience.
This chapter explores a growing source of big data on spatial infrastructure, to reflect on how the built environment constrains and shapes the human experience in urban space. Street networks are perhaps the paradigmatic example of such infrastructure. Urban planners model these networks to investigate trips and traffic, explore urban planning and design histories and better understand the psychology of human navigation and wayfinding in the built environment. This chapter introduces OpenStreetMap (OSM)—a worldwide mapping community and online geospatial data repository—and tools to work with and visualize its data. OSM provides a freely available, high-quality source of data on street networks and other infrastructure worldwide (Jokar Arsanjani, Zipf,

Mooney, & Helbich, 2015). We will discuss what it is, how to use it and how it can help us understand and improve the urban experience.

Through the tools of computer science, data science and visualization, spatial information allows us to see how urban evolution, planning, design and millions of individual human decisions shape how cities organize and order space according to various spatial logics. This chapter introduced figure-ground diagrams and polar histograms as methods of hybrid quantitative-qualitative analysis of urban patterns and the human experiences they shape. These visualizations reveal the texture, grain and spatial logic of different cities around the world. Compressing the dense complexity of information inherent to cities, they offer a streamlined view of the urban fabric and how the circulation system connects it. The figure-ground diagrams allow us to compare across places at the same scale to visualize similarities and differences. The polar histograms compress the complexity of street network orientation into simple plots that reveal the spatial order of the city's streets.
These visualization tools and techniques can help planners convey comparative urban form to laypersons. They can destigmatize density and enclosure and explain how connectivity and texture vary across cities. Finally, they simplify complicated urban planning and data science concepts to make them more approachable to engage members of the public. This can provide a comprehensive understanding of a city's morphological trajectory through time and, in turn, help planners collaboratively shape that trajectory. In tandem, spatial information technologies and urban morphology will further converge to generate new understandings of city pasts and presents and empower planners and community members in collaborative data-driven decision-making processes that center the human experience—physiological, psychological and social—in the co-production of the urban form.

4.5 - A device-free mapping approach for quantifying user activities in indoor environments

Krister Jens share with us that benchmarks and performance standards have long been strategies at higher education institutions to improve how students and faculties use space (Given & Archibald, 2015). The designs of learning environments today often do not live up to what people expect or want to see or be in to feel and work at their best (Kariippanon, Cliff, Lancaster, Okely, & Parrish, 2018). With tools that range from modeling and simulation to virtual reality and digital sensing, tracking user behaviors has become an important parameter for building management system (BMS) studies aiming to bridge the gap between how people are predicted to use space and how people actually use space.

It is long known that human health and well-being is directly affected by our physical built environment—both within the buildings in which we work, study and live, and outside in the public realm, where we gather and contribute to society. It is also well understood that social connections can be enhanced through architectural and urban design that promotes interactive spaces. The beneficial effects on health and well-being by designing inclusive and active designs are well documented (Allen, 2018). Despite this broadly acknowledged potential of open spaces (e.g., ease of interaction, boost in natural light and spaciousness, increased knowledge exchange, better student performances, etc.), they are also known for having drawbacks. Existing literature reveals that the core challenge to design and integrate open spaces into buildings is the complexity of demands they need to meet (Beckers, Voordt, & Dewulf, 2016). A recent study that followed the development of an office space from a traditionally separate-room design to a modern open plan notes that the increased openness 'appeared to trigger a natural human response to socially withdraw from officemates and interact instead over email and IM' (Bernstein & Turban, 2018, p. 1). We learn that the 'good' intentions of open spaces do not always result in the desired social outcomes, and better knowledge about how buildings are actually used would help to adapt the physical design to the real needs and preferences of building users, which also impacts their overall health and well-being (Allen, 2018).

Based on the tradeoffs between sociality and individuality aspects in open spaces, literature reveals the need to reevaluate the human role in architectural and urban designs. Accurate user information (i.e.,

occurrence, counts, activity types, etc.) is vital for evidence-based design and developing successful spaces for people. Recent technological advances shift the focus to sensors and device-based sensing modalities, which are widely available for occupancy sensing (Das, Sangogboye, & Kjærgaard, 2018). For example, these include indoor positioning technologies based on vision (e.g., cameras) and wearable sensors found in mobile phones and smart watches, which provide detailed data on human movement within a space. The downside to these technologies is that they often require expensive support infrastructure, while their ability to detect underlying social, cultural or ambient factors remains limited. Device-free sensing on the other hand—as this chapter proposes—does not lead to privacy infringements while still enabling one to estimate occupancy patterns, pinpointing specific activities and events, and track multiple users without installing additional infrastructure or dedicated sensing devices. Empirical results indicate that space preferences in learning environments arise from personal and cultural narratives, which highlights the need of an integral approach to study how humans behave in a specific building (Roetzel et al., 2019). The advantage of the proposed approach is not limited only to the avoidance of initial investments and of the need for additional hardware or operability costs, but extends to its ability to extract qualitative information to help us best understand user behavior in a specific environment.

Through the lens of space-choice behaviors, this research explicitly targets the linkage between space designs and positive user experience. For this, this chapter proposes a novel device-free sensing method to collect and unravel use patterns in academic settings. The proposed methodology involves activity mapping, implemented and evaluated based in a real-world scenario at the HL Lindner College of Business in Cincinnati, USA. We found that it is feasible to identify key zones within the test site and quantify occupancy patterns, distilling information about specific user activities. In perspective, this method can serve the larger aim of improving the impact of architectural design on how students use spaces in schools. Combined with supplemental information about indoor features and the personal and cultural experiences of the occupants, this method can contribute to a more holistic understanding of how building design affects people.

The chapter presents:

- A case study for user-activity mapping that explicitly describes the different types of activities in which people engage in a specific space. Besides occupancy distributions and seat utilizations, space-choice patterns can also be extracted and reveal insights on location preferences.

- A proposed procedure/guideline to collect and quantify occupancy distributions and activity patterns using a digital tool, ArcGIS Pro. This software is typically associated with large-scale cartography and spatial analysis. It provides a consistent and replicable approach for annotating and collecting individual data points.

- Highly visual output, which can highlight the potential of the method to predict how people will use the space in the future.

Open spaces are broadly implemented in modern workplaces and learning environments to respond to changing life and work patterns. This chapter presents a novel device-free sensing method with the aim to promote and identify the suitability of social spaces where work and quotidian interaction takes place. The method can be applied to indoor and outdoor spaces with the aim to promote the human dimension in architectural and urban design. The tool helps to provide further assistance to researchers, architects, space planners and BMS authorities to execute intelligent building and space operations in the future. With greater efficiency and accuracy, it can also assist the planning of investments into monitoring systems with the aim to track and collect the hard data on disparities between user experiences, expectations and space provision. In perspective, this method can serve the larger aim of improving the impact of architectural and urban design on how space users experience and use open and shared spaces in buildings and cities.

4.6 - Being seen, feeling heard

When conducting a research project on participant retention in intentional communities, Verna DeLauer interviewed residents at the Findhorn ecovillage in Scotland. One resident, Em, explained her reasoning for living at Findhorn.

Ecovillages are communities of people who intentionally live cooperatively with shared values. They are located in over 70 countries. Ecovillages often have their own constitutions that place importance on community service, interpersonal connection and sustainable living. My research took place at the Findhorn ecovillage in Moray, Scotland. Findhorn began in the early 1960s as an experiment in spiritual gardening. Founders believed in the intelligence of plants and drew world attention with their 40-pound cabbages. The community grew (n = 500), enticing people from around the world to receive an 'education in consciousness' (McCarthy, personal communication) whereby daily life was the teacher and one took on the practice of attuning to its lessons. Spiritual practice was, and continues to be, at the heart of Findhorn. Attuning to nature, oneself and one another is the fundamental doctrine. Intimacy at Findhorn is embodied and enacted through community practice. Residents meditate together, grow and cook food together, create their built environment together, entertain together and work through interpersonal conflict together.

As college students progress from dependent child to independent adult, they shift from reliance on others, especially mothers, for lifestyle guidance to an emerging self-reliance and self-protective stance (DeLauer et al., 2019). Colleges have the opportunity to support students during this transition with a nurturing physical and emotional environment. The impact of attending college as an independent 18-year-old should not be underestimated. Even if a student remains at home and commutes, there is still much to navigate within the physical environment of the campus and within oneself (e.g., Who am I here? What is possible for me while I am here? Am I safe? Am I secure?).

The Oxford Dictionary (2020b) has several meanings for the word intimate: closely acquainted, familiar, private and personal, a very close friend. This chapter offers suggestions for improving urban education by making urban colleges appear smaller in scale. Of particular interest is (1) narrowing students' perceptions of the built environment to become more closely acquainted with particular, special spaces; (2) developing practices for private reflection and personal exploration; and (3) attuning to physical space as one would to a very close friend.

Can we offer college students in urban settings something different? A different experience, beyond more parking, more food options, more sports? An experience that intentionally strengthens one's inner nature to better contribute to the complexity of societal issues? Places such as Findhorn, a non-urban, highly intimate setting, offer ideas for creating spaces and practices within those spaces where students feel 'seen,' 'heard' and, ultimately, valued. Rather than students feeling like Em, a Findhorn resident who felt that her college community was made up of individuals 'floating past each other all the time,' students can feel connected if the campus layout, size, scale, building design and social practices account for change.

5 – Book Conclusion

Ann Sussman and Justin B. Hollander on the conclusion of the book highlighted several topics:

- On Paradigm Shifts, Urban Experience and Design (Ux+Design), both the conference and this book, marks the beginning of acknowledging the 21st-century paradigm shift in psychology and neuroscience and its impact on the way we think about and design human settlements;
- Ux+Design Brings Feelings to the Fore

Misha Semenov's chapter calls out how much empathy matters for our species. Nikos Salingaros reminds us of how everything is algorithmic in his chapter, proposing a rating system, or biophilic healing index, for built environments. Perception, along with breathing, walking and heart rate, is all about math. Don Ruggles and artist John Boak encourage us to face the

fact that humans yearn for one specific natural pattern over all others: the face! Nir Buras and Robert Tullis reiterate in their chapters highlighting how much we can learn from architectural history.

- Highlighting the Importance of the 'Unconscious', were many Ux+Design chapters underscored the book's theme, how unconscious processing, outside our conscious awareness, directs our behavior in the built environment;

- Acknowledging We Have Two Brains, the 21st-century paradigm shift in architecture also addresses the brain structure itself that enables our behavior and abilities, particularly the role of our two brain hemispheres. The left brain–right brain move not only reframes architectural theory and our understanding that we can no longer discuss buildings without mentioning their implicit emotional impact—something neglected in 20th-century analyses—but it also rewrites the story of how modern architecture came about;

- Our Exterior Built Architecture Mirrors Our Interior Brain Architecture

A remarkable insight from modern neuroscience is the understanding that what we express externally reflects internal brain structure, or 'the structure of (our hidden) inner world' (Van der Kolk, 2014, p. 307). Because 'reality' is a construct between eye and brain, not only the way we live but also specifically the way we chose to build our buildings reflects hidden internal brain design that we may not know we carry yet unconsciously are always responding to.
This fits the new understandings from neuroscience, which explain that the human brain 'devotes more area to face recognition than to the recognition of any other visual object' (Kandel, 2012). And that a figural primitive for the face, a preexisting right-side-up pattern exists in the brain from before birth, to enable rapid perception of the pattern which as discussed earlier, is most requisite for our life (Sussman & Hollander, 2015, p. 62).

- Because Human Perception Is Relational, Building Façades Need 'Faces'

Because it is so important that we see each other, architectural façades that suggest a face help us 'see' how human perception is built for relationships. It has to be, because as a social species we need to see and be with each other to modulate and control our own emotional states. Nothing is more important. We're made for co-regulation with a face obsession that makes us and shapes us.

It's important to remember, too, that since buildings were not around when our perceptual facilities came to be, the system we use to take in architecture is really designed for interrelating, that back-and-forth dance with another that builds identity, a sense of self, and enables working together, all with one extremely explicit intent: optimizing our chances at survival.
The 21st-century paradigm shift, 'seeing' this evolutionary bias in human perception, including the requisite face obsession and need for relationships, thus reframes how we understand architecture, exactly as Kuhn predicts.

Of course, buildings for millennia across cultures suggested faces. Our interior brain architecture would not let people design, construct or even conceive of anything otherwise (see images of buildings and streetscapes throughout this book from the 19th and early 20th centuries).

- Walter Gropius, the Horror of War, and How Modern Architecture Mirrors Traumatic Brain Injury

Walter Gropius (1883–1969), Mies Van der Rohe (1886–1969) and Le Corbusier (1887–1965) are considered 'founding fathers' of modern architecture. Gropius and Mies, both German WWI veterans, have received retrospective diagnoses of post-traumatic stress disorder (PTSD), while the Swiss-born Le Corbusier, who did not serve in WWI, has a retrospective diagnosis of autism spectrum disorder (ASD). This means that the key 'founding fathers' could not respond to visual stimuli neurotypically, or normally, and helps us better understand why modern built environments both look and feel so different and more fragmented than pre-

20th-century ones. More information on the atypical emotional regulation of the 'founding fathers' and its significance for architectural history and present design is reviewed in the Common Edge article, 'The Mental Disorders That Gave Us Modern Architecture' (Sussman & Chen, 2017); https://commonedge.org/the-mental-disorders-that-gave-us-modern-architecture/. We informally consulted with three psychologists who corroborated Gropius' retrospective PTSD diagnosis after viewing the photographs of his house presented in this chapter.

Modern architecture is generally 'avoidant,' difficult for people to look at or focus on, versus traditional architecture which tends to be 'approachable' and easy for people to take in and move toward (Hollander, Sussman, Levering, & Foster-Karim, 2020; Hollander et al., 2019; Sussman & Ward, 2017).

The 21st-Century Paradigm Shift: Reframing Architectural and Planning History for Our Well-Being

Helping us better understand the impetus for 20th-century modern architecture, the 21st-century paradigm shift also gives us a remarkable opportunity to create a new foundation for design, one where intrinsic, subliminal, human experience is understood and healthy human perception and acknowledgment of how humans actually function, including what they need to see to feel safe and at their best, establish the metrics for architecture and planning.
In 21st-century architecture and planning, practitioners will design more appropriately, improving community health and well-being because:
- They understand that 'unconscious' responses to stimuli, outside our conscious control, direct our behavior in the built environment.
- They employ biometric tools, such as eye tracking and facial expression analysis, to predict human experience, determining how 'approachable' or 'avoidant' a new structure or streetscape may be before it is built.
- And finally, they respect the fact that evolution has largely preset our pre-attentive behaviors, including how we're hardwired to look for and at faces continually, everywhere, all the time—even in architecture. Humans, implicitly seeking out soothing and safety, deserve it in the public realm.
Moving forward, it is important to acknowledge that the remarkable times we are in bring us to a new inflection point, where we confront critical questions. Since, for the first time ever, we can better understand the science of the hidden human experience including how stressful new developments and streetscapes are or will be, even before they are built, these questions become, will we chose to use this information or not? And if not, why not?

6 – Book review conclusion

From the point of view of Urban Creativity Studies the book is stimulating, dealing with many disciplinary coincident concepts but from different perspectives and for different purposes. In general it opens new ways of historically and scientifically structured approach to public space.

The way the book is organized, on a introduction, sections on a chronological logic (past, present and future) and conclusion, it makes the reading comfortable and always correctly framed.

On the introduction the purpose and angle of approach could be clearer. It's a book about User Urban Experience and our built environment. The User Urban Experience it's a concept that worths some reflection, there can be some confusion (and it's not clear across the book) with User Experience (UX) discipline from Don Norman (as it main driver) balancing between digital and non digital UX in a very delicate way. The reality is that most of UX eminently it's developing trough HCI (Human computer areas) and this relation with User Urban Experience concept present on this book is not found.

In the introduction it's clear that, the User Urban Experience concept lives in the interception of architecture, planning, design and psychology. Thus in some ways it is very aligned with the User Experience that myself as editor try to bring to light trough our UXUC Journal.

On the first section (Historical and Theoretical Foundations of Architecture and Planning) we can

find the detailed observation of concept of place evolution, the relations of space and memory, the development of forms in architecture until the World Wars and the cut produced trough Modern Movement in architecture is clear since the first chapter. The relevance of knowledge regarding the architectural forms and traditions is considered something to preserve in order to guarantee urban environments that are suitable for healthy human life. This idea is shared several times during the book, mainly in opposition to the Modern Movement in architecture and in favour of Classical Architecture and Beauty.

Many occasions during the book these ideas are supported by historical evidence but also scientifical references as in the chapter titled: Neuroscience experiments to verify the geometry of healing environments.

On Section II, Twenty-First-Century Tools, Biometrics and Measuring the Human Experience of Place the emphasis on science it's totally evident. Both from biophilic design perspective and from eye-tracking technology, recurrent as quantitative tool in several of the experiments present on this section.

On section III about Explorations of the New Paradigm for Urban Experience and Design, the technical emphasis is total. Mobility and self driving technologies place questions regarding accessibility, how eye tracking can help improve safety and design, but also ecoempathic design and it's professional framing.

Mapping trough Openstreetmap is also used as departure point for street analysis trough intricate software propositions, and in the same vein device-free mapping approach for quantifying user activities in indoor environments is also present as chapter title. As last chapter the ecological perspective is again present, trough the Findhorn ecovillage in Scotland as case study.

The book conclusion itself, runs trough the chapters referencing them in groups regarding different critical topics:

On Paradigm Shifts, Ux+Design Brings Feelings to the Fore; Topic that can be confusing for someone looking for relations trough UX as the disciplinary field that emerged from HCI.

Highlighting the Importance of the 'Unconscious' is a topic very relevant for Urban Creativity Studies, giving a scientifical and medical perspective (psychoanalytical), in the same line of the topic of acknowledging that we Have Two Brains (right and left hemisphere) and the topic of the fact that Our Exterior Built Architecture Mirrors Our Interior Brain Architecture. Culminating on "Faces in Façades" logic a, not so much related with Urban Creativity topic, but mentioned on many occasions on the book. is very present.

The radical cut is made on the self explanatory topic: Walter Gropius, the Horror of War, and How Modern Architecture Mirrors Traumatic Brain Injury. The exploration of this theory can be seen as radical, and certainly is open for discussion (mainly from many of the Modern Architecture advocates).

The book ends on a positive tone: The 21st-Century Paradigm Shift: Reframing Architectural and Planning History for Our Well-Being, although far from the design disciplines, some way creating a direct connection from medicine and design, dangerously subjugating or rigidly generating co-relations between both.

Overall the book is a great source of though and knowledge for all Urban Creativity scholars. There can be some arguments that need more discussion. The one that I fell more questionable, is the univocal criticism to the modern movement in architecture, translated on the deterministic connection between human nature and architectural forms. This fact, although evidently understandable and positive, can be distorted if used deterministically, it's always good to remember that eco determinisms are something to be aware in the near future, as much as we need to be aware of the needed actions to be made globally toward overcoming the planetary challenges of climate crisis and overheating.