

## The Real Meaning of Architecture: Or How to Make Architecture Mean Something

JOSHUA BROADWAY, FREDERIK HEUSER, KELSEY MIDDELKAMP, JOSHUA RALLS  
M.Arch, Graduate Architect, APDesign, Kansas State University

BOB CONDIA, AIA  
Professor of Architecture, APDesign, Kansas State University.

### I. ABSTRACT

Architects ask, 'How does Architecture mean something?' Recent developments in neuroscience and brain imaging bring insight to this classical question. Our proposition is that architecture is understood in an instant, much as we realize a 'first impression,' through the medium of an atmosphere, by way of embodiment, in the manner of affordances.

Architecture is like a *first impression*. The etymology of 'impression' is, "the first and immediate effect of an experience or perception upon the mind," and, "an image in the mind caused by something external."<sup>1</sup> A first impression, being more than a mere impression, is a psychological schema. A phenomenon of composite signals emitted by a new stimulus that is imagined virtually immediately.<sup>2</sup> Such snap-judgments evolved as a survival skill in an eat-or-be-eaten world, however, first impressions are not solely an animalistic survival aptitude. Culturally and socially we are proficient to judge others through archetypes, stereotypes, consciously, or otherwise.<sup>4</sup> Studies in first impressions reveal that in a tenth of a second, humans make characteristic assumptions of a stranger's face.<sup>3</sup> To see a building is similar to perceiving human faces and the connotation of façade. In a study by Chalup et al., facial recognition software was first enlisted to detect human faces, then, the same software was overlaid onto building façades.<sup>4</sup> Facial perception is formed in the brain as empathy or embodied simulation, which not only connects people to other people, but also with objects. The brain pre-reflectively scans a room like a face, with similar accuracy in speed, judgment, empathy and nuance. Our knowledge of space, a product of brain biology, is understood immediately, pre- reflectively, the product of two million of years of evolution.

Atmosphere<sup>5</sup> – more palpable than coordinate space – is commonly understood as a romantic, candlelit dinner. Yet, like an altered state of cognition (ASC), atmosphere is an elusive yet profound consequence of architecture. To convince scientists and architects of it's weight requires tools more precise than language. It requires Arnold Ludwig and EEG studies of the brain. Dr. Ludwig's explains ASC's as deviations of normal, patterned, human cognition, like the mind shift of viewing a movie, listening to music, sexual arousal during foreplay, or architecture, where involved motor impulse and cognitive properties are catalyzed by extraordinary internal and external stimuli; environmental, chemical, emotional, among others. <sup>6</sup> <sup>7</sup> Their consequences include deviations in perception, dissolution of internal and external boundary, altered measures of time, and elastic understanding of consciousness. The science of ASC's is condensed to the oscillations of brainwaves; layered in response to degrees of relaxation and stimuli reception. Four primary waves exist, Beta, Alpha, Theta and Delta, each with measured range in frequency and amplitude.<sup>8</sup> Lowest tiered are delta waves, active in perception and bodily projection (empathy). These waves are monitored through EEG mapping, precisely recording amplitude and frequency of electricity in the brain. Potential for this mental mapping was demonstrated via Gallese and Freedberg by observing suppressed mu rhythms in response to viewing authentic artworks and digitally reproduced counterparts.<sup>9</sup> Mental activity increased significantly more in response to viewing authentic works, opposed to the reproductions. This suggests that humans don't simply spectate creative acts, and are instead biologically tuned to detect human gesture and intent. This is the outcome of evolutionary development to communicate and cooperate with one another pre-linguistically. If true for 2-dimensional artworks, the realm of architectural works, embedded with a complexity of motives and intentions, then such psychological consequences seems certain. Without discrediting atmosphere's poetic champions, we recognize the potential of modern instruments (EEG and fMRI), and developments in psychology endow us with the potential, to measure, at least in part, the consequences of atmospheres.

As atmosphere gives aesthetic medium to space, embodied metaphors give it value. "Embodied" infers embodied simulation<sup>10</sup> whereas "Metaphor" originates from the Greek metapherein - 'to transfer,'<sup>11</sup> indicating the transfer of ideas from one item to another, whether animate or inanimate. The most fundamental of embodied metaphors are harmonies of kinetics. The Greeks implanted the body, as geometry, into art and buildings intending an aesthetic order. These lessons were recorded by the Roman architect Vitruvius,<sup>12</sup> and revived in the Renaissance with a renewed interest in the human body and the revealed divinity of harmonics. Equally, current neuroscience insists that symmetry and proportion are hardwired into pre-reflective judgments of beauty and action. In "Neuroaesthetics: A Review," Cinzia, Gallese, and Di Dio<sup>13</sup> give such a testimony. One can refer specifically Di Dio et al's study of Greek statues,<sup>14</sup> some original and others graphically altered in proportion. The subjects could tell the difference without recognition. As architecture frames aesthetic participation through empathy, geometry and proportion affords us a presence of the body and is seen with higher gravitas as when resonating with harmonics. Geometry in architecture is musical, with rhythm and consonance being the metaphorical equivalent of proportion and perfect geometry. Architecture, in compliment to embodied simulation, is comprehended as a body, the orderly projection of ourselves. The body is acknowledged and embodied in its simplest metaphor as pure geometric projection.

Embodied metaphors are in architecture through the agency of mirror mechanisms as affordances. Standing between scientists and architects, philosopher Mark Johnson, by way of mirror mechanisms, advises that in addition to our need for habitation is our need for meaning. "In other words, although we are animals evolved for fitness, we are just as much animals with a deep desire for

meaning as part of our attempts to grow and flourish."<sup>15</sup> Meaning in architecture arises in two ways: First as a felt qualitative unity that sets up a world (i.e., aesthetic experience); Second, as a building's specific affordances offer the possibility of meaningful engagements relative to its contexts.<sup>16</sup> Johnson's application of Gibson's 'affordances' gives critical specificity to how meanings in architecture are made. Affordances – the actions our body can create with objects and situations – are only meaningful in relation to their context. For instance, room not only affords us the ability to house our personal objects, but to have meaningful encounters with/in them. The affordances of a room also extend to social and cultural functions.<sup>17</sup> Since embodied simulation (empathy) is responsible for the social understanding among humans, we are naturally able to intuit the mood of the room for different scenarios, such as personal study or a romantic dinner. The room also affords personal and past experiences. Memory and spatiality are inseparably linked. While navigation is a multi-modal task requiring memory, spatial representation is necessary to recall specific memories.<sup>18</sup> A simple room is a fraction of that which Juhani Pallasmaa asserts architecture may accomplish. Neuroscience provides a foundation for architects to create potential places of meaning.

To confirm our several notions we need to discover how faces and architecture are similar in the brain. For architects atmosphere is thick with mood, but how do we measure it. That we embody architecture is well understood, the aesthetic implications of such simulation is an open research on how architecture can be a stimulus. Relatedly, the meaning of architecture is in what it affords us, yet can a design theory be one result of this clear thinking? We seek intimate partnership between architect and scientist, harkening back to an age when both were one, with the same obligation as servants of society.

### 2. REFERENCES

<sup>1</sup> Webster's, New Universal Unabridged Dictionary, Barnes and Nobel, 2003: 962.

<sup>2</sup> Flora, Carlin. "The First Impression." Psychology Today. Sussex Publishers, LLC, 14 May 2004. Web.

<sup>3</sup> Willis, Janine, and Alexander Todorov. "First Impressions: Making Up Your Mind After a 100-Ms Exposure to a Face." Psychological Science 17.7 (2006): 592-98. California State University Chico. Sage Publications. Web.

<sup>4</sup> Chalup, Stephan et. al. "A Face-House Paradigm for Architectural Scene Analysis." CSTST (2008): 27-31.

<sup>5</sup> Zumthor, Peter. Atmospheres: Architectural Environments, Surrounding Objects. Basel: Birkhauser, 2006. 10-73.

<sup>6</sup> Ludwig, Arnold M. "Altered States of Consciousness." September 1966. : "any mental state(s), induced by various physiological, psychological, or pharmacological maneuvers or agents, which can be recognized subjectively by the individual himself (or by an objective observer of the individual) as representing a sufficient deviation in subjective experience or psychological functioning from certain general norms for that individual during alert, waking consciousness."

<sup>7</sup> The gentle alteration of the mind is not exclusive to the built environments. Due in large measure to our evolutionary development, rooted in survival tactics on the savannas of Africa. To scan our environs, receiving information through our complete set of senses in order to ensure the continuity and provision of our lives. The 'wholeness' of atmosphere refers to the reflective and pre-reflective nature of presence [the event]; a cooperation of our psychology and physiology its result. The "seduction" of atmosphere lies in its mysterious—hypnotic—presence, drawing its participant back to precise, profound, moments in time and space (production of image/memory). Zumthor reduces the wholeness of Atmosphere to nine components, each with sensual consequence and mental contemplation. For architects, 'atmosphere' is perhaps poetic jargon to describe the seduction of space, and its ability to transport its participant to two places; the physical space of the present, and the mental—imagined—space of the past.

<sup>8</sup> Four primary waves exist, Beta, Alpha, Theta and Delta, each with measured range in frequency and amplitude. Beta waves, primary in cognitive function, mobilize our immediate understanding of the external world, facilitating comprehension of time, space, thought organization and logic. Alpha waves, bridge consciousness and unconsciousness and are responsible for the production of image, intuition, and the event of creativity. Theta waves are present in the formation of symbolism and spiritual matters.

<sup>9</sup> Umiltà, M. Alessandra, Cristina Berchio, Mariateresa Sestito, David Freedberg, and Vittorio Gallese. "Abstract Art and Cortical Motor Activation: An EEG Study." Frontiers in Human Neuroscience, 2012.

<sup>10</sup> Embodied Simulation (n.) "A functional mechanism through which the actions, emotions or sensations we see, activate our own internal representations of body states that are associated with these social stimuli, as if we are engaged in a similar action or experiencing a similar emotion or sensation." Freedberg, D. & Gallese, V. (2007). Motion, emotion and empathy in esthetic experience. In: TRENDS in Cognitive Sciences, II(No. 5), 197-203.

<sup>11</sup> "metaphor, n." OED Online. Oxford University Press, December 2015. Web. 15 December, 2015.

<sup>12</sup> Pollio, Vitruvius, and M. H. Morgan. Vitruvius: The Ten Books on Architecture. New York: Dover Publications, 1960. "Books I & III," pgs. 5-17 & 72-75.

<sup>13</sup> Cinzia, Di Dio, and Gallese Vittorio. "Neuroaesthetics: A Review." Current Opinion in Neurobiology (2009): 682- 87. <http://www.unipr.it/>. UNIVERSITÀ DEGLI STUDI DI PARMA. Web. 5 Dec. 2015.

<sup>14</sup> Di Dio, Cinzia, Emiliano Macaluso, and Giacomo Rizzolatti. "The golden beauty: brain response to classical and renaissance sculptures." PloS one 2.11 (2007): e1201.

<sup>15</sup> Johnson, Mark, L. "The Embodied Meaning of Architecture" pg. 33 - 50 in Mind in Architecture: Neuroscience, Embodiment and the Future of Design, By Sarah Robinson and Juhani Pallasmaa. Cambridge, Massachusetts: MIT. 2015.

<sup>16</sup> Ibid.

<sup>17</sup> Gallese, V. "Empathy, Embodied Simulation, and the Brain: Commentary on Aragno and Zepf/Hartmann." Journal of the American Psychoanalytic Association 56.3 (2008): 769-81. Web.

<sup>18</sup> Groh, M. Jennifer highlights Memory and its dependence on spatiality in her book: Making Space: How the Brain Knows where Things Are. Massachusetts: The Belknap Press of Harvard University Press. 2014.