# Can We Use Empirical Means to Understand Sacred Architecture? A Neurophenomenological Approach

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Can we use empirical methods to better understand the phenomenological effects of sacred spaces and structures? Until a generation ago, this is a question that would have been anathema to anyone sensitive to the qualitative dimension of human existence – and certainly to most phenomenologists (Bermudez 2014). Yet, Maurice Merleau-Ponty, one of the greatest phenomenologists of the 20th Century, seemed to point at the need for a naturalization of phenomenology, that is, a recognition that there is no transcendental consciousness but rather that all consciousness is invariably embodied and therefore empirically grounded (Battan Horenstein 2010, Smyth 2010). It is precisely here where today's cognitive science and neuroscience base their claim that, in principle, we can measure the seemingly immeasurable or, at the very least, record the echoes of something perhaps more immaterial or evanescent such as consciousness (Petitot et al. 1999).

The work and thought of late neuroscientist Francisco Varela loom large here (Varela 1996), but much has occurred since his passing, and a whole new world in neurophenomenology is rapidly unfolding (Damasio 2012, 2021). And then, there is "aesthetic cognitivism," a philosophical position seeking to determine concrete and, therefore, measurable aesthetic responses to art and beyond (Graham 2005, Baumberger 2013). Even in fields such as theological aesthetics, traditionally interested in ethical, metaphysical, and symbolic issues, there is growing attention to empirical matters (Viladesau 2015). Clearly, we can see a relationship between these developments and Experimental Philosophy, a movement that started in the early 2000s that proposes using empirical means to elucidate old, seemingly intractable philosophical questions (Appiah 2007, Knobe and Nichols 2008).

Since architecture is not isolated from the world, this novel vision of the empirical has brought new ideas and demands to the discipline. In this regard, architecture has always had a vexed relationship with its empirical nature. On the one hand, architects must produce clear and concrete instructions to put a building together using tangible materials. There is little room for aloof thinking here. In addition, architects must deal with utility and programmatic success to respond to market-driven expectations. Hence, regardless of how much theoretical, idealistic, and other esoteric goals architects have (and they do!), they sooner or later must come to terms with the fundamental empirical dimension of producing and "consuming" (i.e., using, experiencing) buildings.

It is thus not surprising that, as the power and relevancy of empirical means have grown in other disciplines, so has their influence expanded in our field of architecture. In the receptive or experiential side of architecture, the remarkable development of evidence-based design is a case in point. It is increasingly necessary to address what we are (empirically) learning about how buildings affect human beings. Still, approaching highly qualitative conditions, such as those presented by sacred architecture, has presented researchers with, until recently, a dead-end due to the lack of appropriate probing tools. But as this situation has been quickly changing, we must consider this matter seriously. Which brings us back to the question that started this paper: can we deploy today's most advanced empirical means to gauge architectural experiences associated with spirituality, the sacred, and the like? And if so, how and to what level of success?

Grounded on these arguments, this presentation will share the fundamental theoretical, scientific, technological, and methodological tenets behind a 3-year long research effort seeking to respond to this question. Using cutting-edge medical and vision instrumentation such as mobile electroencephalograms (EEG), biosensors, and eye-tracking glasses in coordination with a battery of subjective reports carefully designed to investigate the nature of phenomenological experiences, we have been able to collect physiological (third-person) and phenomenological (first-person) responses to two different architectural conditions: one secular and one sacred. This has allowed us, in principle, to relate internal (i.e., conscious, psychological, subjective) and external (i.e., behavioral, physiological, objective) states in individuals experiencing the two architectural conditions. By comparing the responses of a sufficiently large number of subjects to the two conditions, the fundamentals of a neurophenomenological approach to sacred architecture have thus been laid down. Refer to Figures 1 and 2.

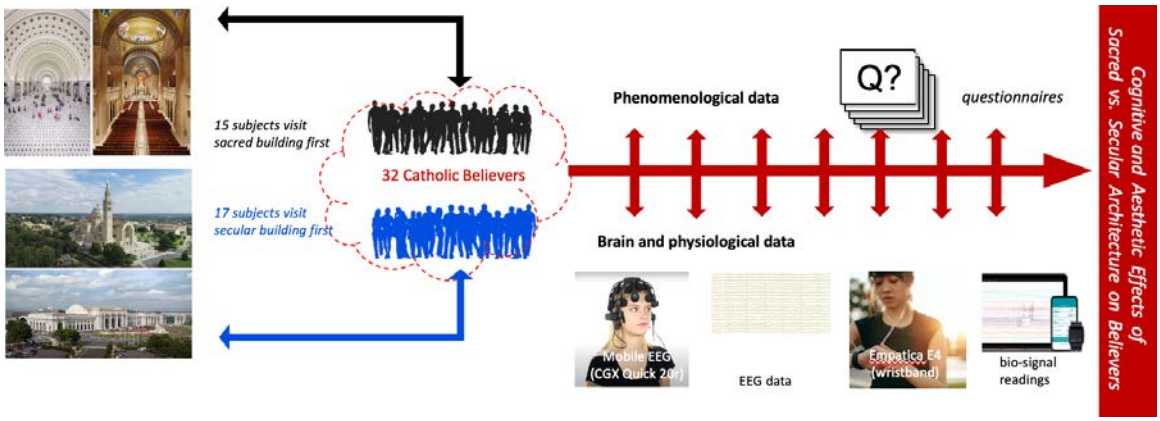


***Figure 1**: Diagram summarizing the first research project studying the response of 32 Catholic subjects to a sacred building of their faith (the Basilica of the Immaculate Conception) and a secular building of similar urban presence but without any religious function (the Union Train Station), both in Washington, DC. The image shows the phenomenological and neurophysiological methods deployed. Subjects were randomly assigned to start with one or the other building.*

***Figure 2**: Example of research subjects wearing the mobile EEG device while visiting the train station (on the right) and the Basilica (on the left). The study protocol followed a strict path that included 5 stops, when subjects were asked to assess their levels of anxiety, aesthetic response, connectedness (to the world, others, or God), internal dialogue, and sense of spiritual reality. At the end of each visit, subjects filled out an exit questionnaire probing subjects' levels of attention, cognitive engagement; aesthetic/architectural sensibility; access and retention of spiritual information; degree of transportation to spiritual reality; and disturbance (if any) resulting from following the research protocol.*

This research effort demanded a great deal of interdisciplinary collaboration among fields as diverse as architecture, neurology, psychology, computer science and engineering, and theology.

Such broad interdisciplinarity has not been easy to achieve, nor has the deployment of its methods and technologies. In addition to discussing some results from our project, we will also share some of the challenges we have encountered in the process.

This presentation will expose ACSF symposium attendees to new empirically-grounded ways to interrogate architecture in general and sacred spaces and experiences in particular. Our goal is to use this research project to discuss more significant, paradigmatic issues associated with harnessing 21st Century knowledge, science, and scholarship to understand better how architecture (and sacred spaces) gives us access to spiritual realities and information conveyed and mediated by architectural experience.

**For more information, go to:**

- https://www.building-spiritual-understanding.net (research website)
- https://youtu.be/nmknuP8ckj0 (video summarizing EEG part of the investigation)
- https://templetonreligiontrust.org/explore/deconstructing-the-spiritual-experience-of-architecture/ (article describing the first part of the study)
- https://templetonreligiontrust.org/explore/how-sacred-architecture-conveys-spiritual-understanding-a-biometric-based-study/ (article describing the second part of the study)

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**References**

Appiah, Kwame Anthony. The New Philosophy. *The New York Times*, Dec.9, 2007. URL: https://www.nytimes.com/2007/12/09/magazine/09wwln-idealab-t.html

Battan Horenstein, Ariela. "M.Merleau-Ponty: Phenomenology and Naturalization." *Ideas y Valores* 59, no.144 (2010):117-139

Baumberger, Christoph. "Art and Understanding: In Defense of Aesthetic Cognitivism." In *Bilder sehen: Perspektiven der Bildwissenschaft*, edited by M. Greenlee et al., 41–67. Regensburg: Schnell & Steiner, 2013.

Bermudez, Julio. "Considering the Relationship between Phenomenology and Science." *Environmental & Architectural Phenomenology* 25, no.3 (2014): 51-54

Damasio, Antonio. *Self Comes to Mind: Constructing the Conscious Brain*. New York: Vintage, 2012.

Damasio, Antonio. *Feeling and Knowing*. New York: Pantheon Books, 2021.

Graham, Gordon. *Philosophy of the Arts: An Introduction to Aesthetics.* 3rd. edition. New York: Routledge, 2005.

Knobe, Joshua and Nichols, Shaun, eds., *Experimental Philosophy*. New York: Oxford University Press, 2008.

Petitot J., F. Varela, B. Pachoud, and J.M. Roy, eds., *Naturalizing Phenomenology: Issues in Contemporary Phenomenology and Cognitive Science*. Stanford, CA: Stanford University Press, 1999.

Smyth, Bryan. "Merleau-Ponty and the 'Naturalization' of Phenomenology." *Philosophy Today*, 54 (2010): 153-162

Varela, Francisco. "Neurophenomenology: A Methodological Remedy for the Hard Problem." *Journal of Consciousness Studies* 3 (1996): 330-349;

Viladesau, Richard. "Art and God." *Artenol* 1 (Spring 2015): 22-30