Architecture and Neuroscience: towards spatial atmosphere and sensory experience in a phenomenology-based design methodology

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I. EXTENDED ABSTRACT

As reflection is forced out of architecture schools by the realities of the workplace (MALLGRAVE, 2013), building design courses tend to privilege solving programmatic, functional and technical issues. This paper discusses a diverging strategy that brings neuroscience and architecture together in the design process. It describes a phenomenology-based methodology in which spatial atmospheres (ZUMTHOR, 2006) and sensory experiences are pursued through the understanding and use of natural light, hence the protagonist in the process.

Light and vision are tightly connected: the latter has a primary role in experiencing space, but it depends on information conveyed by patterns of light, mostly originated by reflectance from physical surfaces (ALBRIGHT, 2015), indicating that light becomes visible only by interacting with matter. Acknowledging our multisensory presence (MALLGRAVE, 2010; PALLASMAA, 2005), the intention is not to favor vision in detriment of other senses, but to use natural light as a means to achieve the intended ambience.

The methodology relies on the rational that students can conceive a particular space – through cellular spatial experiments – and expand the concept to the entire building (LAWSON, 2005), a crematorium bordering a 19th century cemetery in Recife, Brazil. Three phases are carried: (1 - NAVIGATION) based on the notion that space is comprehended only when we perceive it through embodiment (CONDIA, 2014), students register sensory stimuli elicited during site visits to burial and religious places; (2 - EXPERIENCE) test possible spatial atmospheres by manipulating light and massing through physical models; (3 - DESIGN) develop building design by applying prescriptive spatial ambiences and sensory experiences, including specific lighting effects, employed according to the nature of spaces they act upon: crystal veils, luminescence, atomization, procession, evanescence and environmental silence (PLUMMER, 2009).

As a result, design proposals have reached a strong sense of place in regards to defining introspective atmospheres, potentially favoring concentration and inner reconcilement, keys aspects in spiritual environments. We also verified that this spatiality strongly relates to designs adopting regular contour orientations derived from familiar geometric shapes, perhaps mirroring the fact that our cortical system tends to favor regular visual patterns (ALBRIGHT, 2015).

The merging of neuroscience and architecture seems to open way for varied studies, such as the exploration of light discussed here, which attempts to facilitate the understanding and use of this natural agent in the design process, allowing for buildings that help stimulate sight and, consequently, improve the multisensory potential of architecture. Although we dealt with step-by-step procedures, the process was reduced to previewing lighting effects through limited resources. One further exploration to possibly minimize the ever-challenging gap between designer, users and spatial experience would be the use of immersive virtual reality environments to simulate and test the intended effects in relation to the sensory stimuli they elicit upon users.

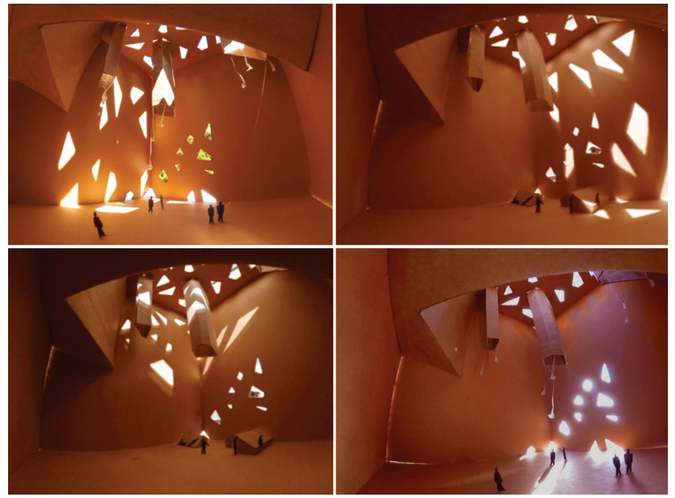

Figure 1: Phase 2 of design process depicting manipulation of light and massing. Photo credit: Stephanie Gonzaga.

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