



## NEUROPHENOMENOLOGY OF EMBODIED SYMBOLS – THE CASE OF THE SQUARE AND THE EGG

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While architecture and arts have recognized the importance of symbols for centuries, current studies in neuroscience have only recently started examining the subject, focusing on the relationship between sensory experience and architectural perception. In the field of phenomenological philosophy, Maurice Merleau-Ponty (1964) has previously suggested a theory postulating the embodiment of the built environment into our daily sensorial experience, emphasizing the close relationship between architectural experience and bodily self-consciousness (Mallgrave, 2011; Pasqualini, Llobera and Blanke, 2013). Nevertheless, the question whether different embodied symbols have specifically defined psychological and neuronal effects remains open.

In order to address this question, we chose to compare the effects of two embodied symbols, *the Square* and *the EGG* on phenomenological reports of experience. This was conducted with two contemplative practices representing the opposite sides of the spectrum (i.e., movement and sitting meditation): Quadrato Motor Training (QMT), a whole-body movement mediation (Ben-Soussan, Glicksohn, Goldstein, Berkovich-Ohana, Donchin, 2013; Ben-Soussan, Glicksohn, & Berkovich-Ohana, 2015), and the EGG (Paoletti, Glicksohn, Berkovich-Ohana, Ben-Soussan, under submission), a spherical sensory deprivation tank), which were conducted within a highly restricted space.

In a recent study, we compared phenomenological reports collected immediately following these two practices. 30 practitioners of breathing meditation novice to these practices performed a session of either QMT or EGG (n = 15, each), followed by a semi-structured interview. The reported experiences were classified into content units. Following factor analysis, experiences were classified into three categories: alteration in the perception of: (1) space-time, (2) bodily sensation and (3) emotion. Significantly more experiences were reported following The EGG in comparison to the QMT group in both space-time and bodily sensation categories. In addition, the EGG group reported more experience related to neutral emotions, as opposed to positive or negative emotions.

The results suggest that the whole-body embodiment of specifically defined symbols, such as the Square and the EGG, can produce distinct phenomenological experiences. The results are in line with the Sphere Model of consciousness (Paoletti, 2011). Their implications for architecture, arts and contemplative neuroscience are discussed in relation to the effects of embodied symbols on



perception and higher states of consciousness, emphasizing the importance of the external environment for obtaining a specific inner state.

## References

- BEN-SOUSSAN, T. D., GLICKSOHN, J., GOLDSTEIN, A., BERKOVICH-OHANA, A., DONCHIN, O. (2013). Into the square and out of the box: The effects of Quadrato Motor Training on creativity and alpha Coherence. *PLoS ONE*, 8(1), e55023.
- BEN-SOUSSAN, T. D., GLICKSOHN, J., & BERKOVICH-OHANA, A. (2015). From cerebellar activation and connectivity to cognition: a review of the Quadrato Motor Training. *BioMed research international*, 2015.
- MERLEAU-PONTY, M. (1964). *Eye and mind*, in *The Primacy of Perception*, ed. J. E. Edie, trans. C. Dallery. Evanston, IL: Northwestern University Press, 159–190.
- MALLGRAVE, H. F. (2011). *The Architect's Brain: Neuroscience, Creativity, and Architecture*. Chichester: Wiley-Blackwell.
- PAOLETTI, P., GLICKSOHN, J., BERKOVICH-OHANA, A., BEN-SOUSSAN, T. D., (under submission). Differential effects of space and affordance on awareness: a phenomenological comparison between Quadrato Motor Training and whole-body perceptual deprivation.
- PAOLETTI, P. (2011). *Mediation*. 3P InformaAzione editing.
- PASQUALINI, I., LLOBERA, J., AND BLANKE, O. (2013). 'Seeing' and 'feeling' architecture: how bodily self-consciousness alters architectonic experience and affects the perception of interiors. *Front. Psychol.* 4:354. doi: 10.3389/fpsyg.2013.00354