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like visual stimuli for example, can give insights to aspects of social values, materials and architectural details.

This would be a unique opportunity to offer current academic thinking with scientific methods to enable a comprehensive study into the value of tradition within an advancing Gulf state.

11. MANOAJE(1): a proposal to re-found the “language” of “architectural thinking”

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ABSTRACT

This research explores the problem of the nonexistence and need of an operational and integral definition of “language” in the field of re-presentation in architecture, despite the widespread and historic use and tacit validation of ‘drawing’ and ‘modelling’ as such, both in academic environments and in professional practice.

KEY WORDS

Architectural thinking, Language, Grafoaje, Manoaje, Cognition, Enaction, Sensorimotor Intelligence, Architectural intelligence, Thought, Representation, Drawing, Modelling

In addition, the study and the set up of architectural re-presentation have been made through many of loans —rather impositions— categorical, procedural, structural and conceptual, accruing from linguistics and from the 'General Theory of Signs' (De Saussure and S. Peirce). In other words, architectural re-presentation has been studied in an imprecise way, treating it as a language and/or operating it on highly poetic metaphors ("thinking with hands", "conceptual space" and "reading buildings" are three examples). This question has generated profound and incalculable categorical, procedural, structural and conceptual slants and blindness, hindering and/or directly impeding the development of an epistemological and/or an integral theory of architectural re-presentation. This also has many practical effects, for example in the field of teaching. If we consider the link in the language-mind-thought-cognition-learning polynomial and literally transpose it into drawing-mind-thought-cognition-learning polynomial, on the automatic and unthinking assumption that such a nexus operates in the same way, we are not investigating the existing differences and different evidences, practices and theories, which have been shown since the last century.

The research reviews from different perspectives the common metaphor of "thinking with the hands". This concept is reviewed through the critical differences (psychological, neurological, cognitive, linguistic, sensory, among others) between “thinking”, based on the agitation of single organs/limbs (like the tongue during speech), or “thinking”, based on the agitation of dual organs/limbs (like the hands while drawing or modeling). For this purpose it is also necessary to reconsider the pertinence of the common use of the concept of ‘thinking’, instead of the concept of ‘intelligence’ (Piaget, Wilson) in projective practices.

Methodologically, this work summarizes a field research with documental character and generalist tone. It seeks to link to each other topics that have been studied in depth in different disciplines, but which continue to be not connected among them, in part because of the disciplinary splitting and/or impurities based on generalizations and/or conceptual inaccuracies. From this point of view, this paper examines the problem of the partial incompatibility of language (and Maturana's 'lenguajear' (2)) as a support of thought, learning and human cognition, in general (Wittgenstein Piaget, Vygotski, Chomsky, Sapir, Bruner, and others) with the particular mental processing inherent to "architectural thinking" (Sperry, Edwards, Seguí, Zumthor, Pallasmaa, Bruner, and others). This "architectural thinking" is based on the visual thinking/ visuospatial thinking (Arnheim, Letelier and others), sensorimotor intelligence (to Piaget, spatial intelligence and cenestésico-corporal, to Gardner) and hand use (Wilson, Bell, Bergen, Sacks, Seguí, Pallasmaa and others) specific to the "enactive knowledge" (Bruner, Varela) involved in projective practices and architectural re-presentations.

The underlying hypothesis of this research assumes that '«manoaje» is a homologous neologism to "language"(3), but argued on the basis that in-tensional making with the hands, is the material base of "architectural thinking", and is also responsible for the project configuration by means of the architectural work' (CÁRCAMO PINO, 2013). In other words '«if for an adult human being language is the material base of thought» (ITZIGSOHN, 1995), for architects, manoaje is the material base of "architectural thinking" [and redefined architectural intelligence]' (CÁRCAMO PINO, 2013).

As described above it is done by reviewing first; The structural logic of language from its historical material support (the tongue as a unitary organ); Through the constitutive structure of the same (additive sound sequences with signifiers, meanings, syntax); By the conditioning relationship that keeps the language with the thought and its effects on the learning (material base of the thought and cognitive conditioner); And by the way, introducing itself into the dynamics of thought and the way of cerebral processing involved (Aspectuality, discreteness, sequentiality, opposition, hierarchy)

Secondly, disciplinary practices and processes are characterized (projective drift and recursive testing), the pedagogical tradition of the workshop (lab) (solving problems via test and error, e.g.) and the means of architectural re-presentation (drawing, model, assembly, diorama, among others) distinguishing between representation, presentation, prefiguration and preformation, to make a counterpoint among them with the logics of thought (verbal) and their procedural corollaries (method, process, systems and others), learning and cognition described above.

This demonstrates the inadequacy of natural language, verbal thinking involved and, in short, all verbal cognitive mode to operate aspects of the projective practices in architecture, mainly in the aspects linked to the production of form and figure, operations of qualitative integration (like composition, harmony, balance, tension) and spatial mental imagery. This scenario is reviewed, this time, from: The use of the hands (Wilson, Bell, Bergen, Sacks, Seguí, Pallasmaa), The cerebral functional specialization (Sperry, Edwards, Wilson, Bergen, Rizzolatti among others); The incarnate simulation (Bergen, Rizzolatti, among others); Intelligence (Piaget, Wilson, Gardner, Goleman, among others) and learning (Piaget, Vigostky, Bruner, Varela)

Thirdly and founded on the dissonance mentioned above, it is established that it is necessary to re-found conceptually a "language" proper to the discipline, endorsing and proposing the concept "Manoaje". This concept is considered as a generalization of the «grafoaje» coined by Perez Carabias in his text «grafoaje and creativity»: an ad hoc "language" that «aids urban designers, architects, industrial, graphic, and interior designers; and also sculptors, painters and sketchers, in the mental processes of handling space, form or figure (spatial mental imagery)» (PÉREZ CARABIAS, 2006). The previous expansion and/or generalization of the work of Carabias seeks to extend its scope, extending it beyond the graphic and, directly, incorporating the manipulation of physical objects as an enactive experience that integrally includes the extra-graphic and non-linguistic means of the architectural re-presentation.

Finally, the discussion focuses on possible consequences that may arise from the conceptual redefinition made, and from the ex novo neologism «manoaje». From this perspective, and considering the operational characteristics that this neologism sets, this research explains the utility of this epistemological exercise to approach and to specify countless issues that persist in the academic and disciplinary work even today.

- (1) *The concept of Manoaje is conceived as an integral definition of "language" of architectural re-presentation, which encompasses drawing, model and assembly, among other presentations. Is a «Homologous neologism to language but with hands. Based on the intentional agitation of hands and the impact this has on matter to communicate or self communicate (to "reflect"). Although, in strict definition, it is not a language, manoaje frees the "language" of the semantic weight that the noun «tongue» imposes ("tongue" is "lengua" in Spanish), keeping only the essential condition of the "set of signals that suggest something" (RAE, 2012), certainly with the substantive differences this implies, even in the definition of the communicating something» (CÁRCAMO PINO, 2013). It is the generalization of grafoaje, understood as «[...] the system of signs for the representation of threedimensionality, that aids urban designers, architects, industrial, graphic, and interior designers; and also sculptors, painters and sketchers, in the mental processes of handling space, form or figure (spatial mental imagery)» (PÉREZ CARABIAS, 2006).*
- (2) *Neologism that refers to the act of being in the language, without associating such an act with speech, as it would be with the word speak" (MATURANA, 1989)*
- (3) *In Spanish the word "lenguaje" (language) and the word "lengua" (tongue) share the same Latin root: "lingua". Therefore, in the neologism "manoaje", the word "mano" (hand) replaces the Latin root word "lingua" (tongue).*