Semiotics and Architecture: How Can it Become a Fruitful Coactive Relationship?

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Architecture has always been a difficult subject matter for semioticians. On the one hand, space is not easy to formalize in any way, and, on the other hand, architects have not helped at all, on the contrary, they uncovered a lot of problems and never found solutions. The excellent research work made by the IASS coordinated by professor Pierre Pellegrino, and also the PHD program in the School of Architecture in Tunisia, thanks to the late professor Alain Renier, are two examples of endured effort, that were very often not recognised by universities and professional institutions. The situation is slowly changing, at last, and a surprising impulse is coming from the design by computer processes, since now architects need more theories in order to justify their new expertises. My contribution will show how these new processes can increase the coaction between semiotics and architecture, starting from the probabilistic epigenetic model defined by the late professor Gilbert Gottlieb. This coaction between architecture and semiotics, demands a better clarification of the deep relationships between cognitive construction and cognitive communication, both in architecture and in semiotics, an old topic that can today be revisited. From this point of view, some cognitive anthropological recent developments (E, Hutchins, D. Kirsh and others) can show the right

way to go. Then, following the last work by Professor Alva Noe, architecture and semiotics could follow their own developments, hand by hand, in a similar way art and philosophy can interact. They can be two different ways of organization of our lives, without the subordination of one by the other. Some examples of this coactive interaction between semiotics and architecture constitute the conclusions of this communication.

Keywords: Epigenesis, Cognition and communication, Spatial cognition and social interaction, Semiotics and architectural design coactions.

Chapter one. The epigenetic hope

The work by Gilbert Gottfried[1] follows the track that from the first article by Mikhail Bakhtin[2] and the seminal works by J. A. Thomson and Patrick Geddes[3], goes throughout the important book by Jean Piaget[4] on adaptation and evolution in 1973, and ends in the last scientific analyses recently described in an article by Siddhartha Mukherjee[5] on a revolution in the cancer cure with the suggestive title *The Invasion Equation*.

Epigenesis is a common link among these disperse studies, and, even though we still know very little about it, the new findings are shocking and challenging, and it

1. Gottlieb, Gilbert. «Probabilistic Epigenesis of Development», en J. V. Connolly & J. Valsiner, *Handbook of Developmental Psychology*, (págs. 3-17). London: SAGE, 2003.
2. Bakhtin, M., *Art and Answerability*, University Texas Press, 1990. P. 1, 2.
3. Geddes, Patrick; J.A. Thomson Life: Outlines of General Biology, Harper & Brothers, London, 1931.
4. Piaget, Jean. Adaptation vitale et psychologie de l'intelligence, París, Hermann, 1974.
5. Mukherjee, Siddhartha. The Invasion Equation (Will a tumor spread? That may depend as much on your body as on your cancer), New Yorker, September II, 2017.

gives new meanings about the relationships between an organism and its environment in relation to their physical, social and mental dimensions, and also between architectural objects and their environments.

Figures one to seven are the different epigenetic interactions that show the complexity of the architectural products out of the designer minds, using selected interrelations between a building and its environment.[6] As a conclusion we can understand why the linguistic analyses top –dawn or dawn-top produce in both cases poor architectural objects and why epigenesis has real meanings when the epigenetic development is simultaneously top-dawn and dawn-top, just at the point where knowledge articulates cognition with communication. It is extraordinary that both, Jean Piaget in 1974 and the analyses by Siddhartha Mukherjee in 2017, start with the observation of the development of mussels in specific lakes, in Switzerland, in the first case, and in the lake of Michigan in the second case. Similar experiments fifty years after, in order to arrive to the same conclusion: The epigenetic intercourse between the context and the organism is far to be rooted only in the organism, in fact, it is rooted on the feedback between the «guest» –the organism or the design–, and the «host» –the environment or the place–.

This paper wants to argue that the meaning of architecture cannot be deduced from a linguistic code of the object, either at their mental, social or physical dimensions, but from the deep action, or coaction, between objects and place, geography and history, project and history, forms and use. As a recent work by Albena

6. Josep Muntañola Thornberg, Magda Saura Carulla, Júlia Beltran Borràs, Maria Teresa Trejo Guzmán, and Josue Nathan Martínez Gomez, *On the search of the bio-psycho-social digital kernel of architectural design,* 3rt International conference Biodigital Architecture & Genetics, ESARQ, Barcelona, 2017.

Yaneva[7] shows, these coactions are generatively «political» and they can be analysed in a first attempt by the known social paradigm of the «Actors Network Theory» by Bruno Latour.8 In this way, the study of how a building works uncovers how this same building produces meaning, in a way not far from the way Professor L. Tchertov[9] defines the semiotics of architecture: «Form as a category of spatial semiotics».
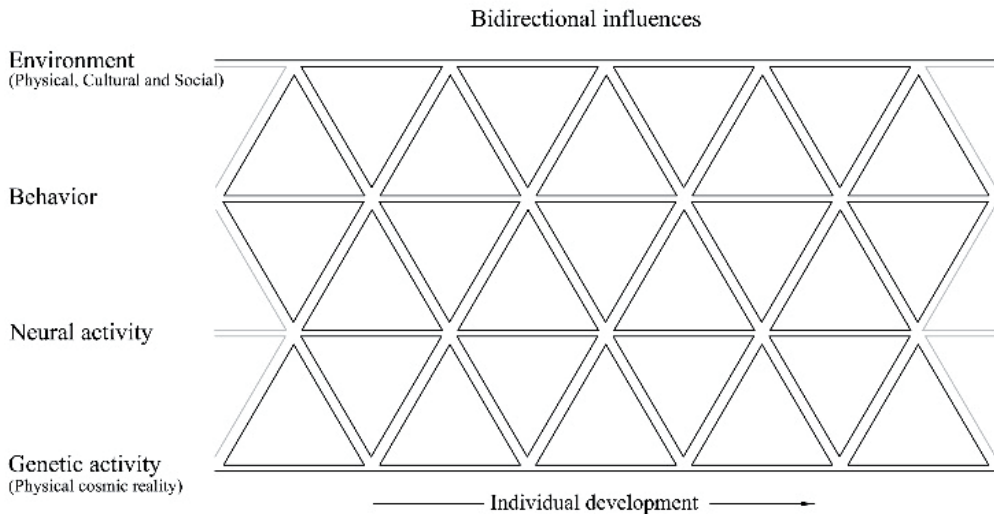

Figure 1. *Probabilistic Epigenesis of Development.*

7. Yaneva, A. Five ways to make architecture political, London, Bloomsbury Publishing, 2017.

8. Latour, Bruno, *Cogitamus. Six lettres sur les humanités scientifiques*, París, La Découverte, 2010.

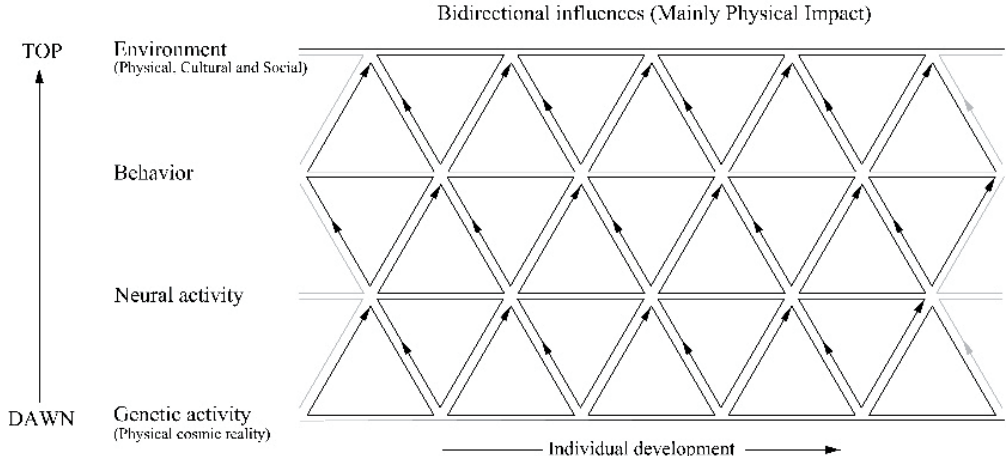9 Tchertov, L. Form as a category of spatial semiotics, 13th IASS-AIS World Congress of Semiotics, Kaunas, 2017.

Bidirectional influences (Mainly Physical Impact)

TOP

Environment
(Physical, Cultural and Social)

Behavior

Neural activity

DAWN

Genetic activity
(Physical cosmic reality)

Individual development

Figure 2. *Biogenetic Natural Theoretical Trends A.*

Trends A

Novak M.

Square in Sevilla, J. Mayer, 2011.

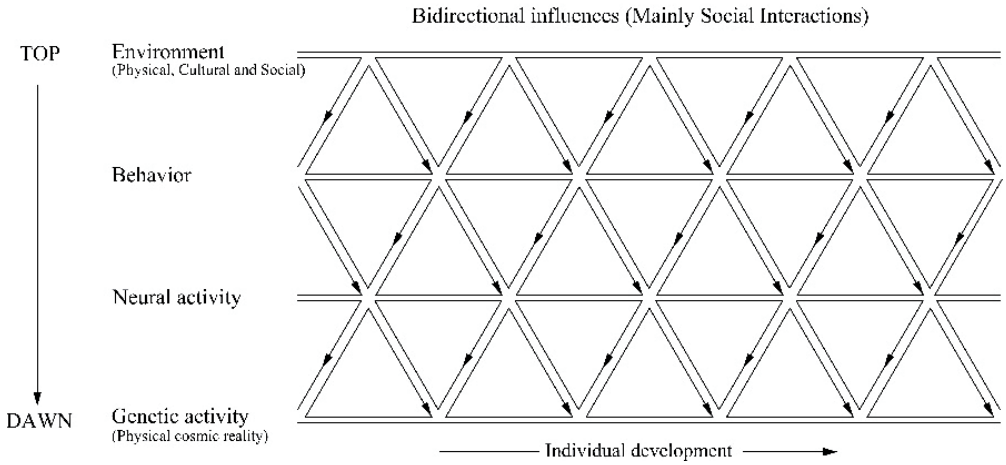**Figure 3.** *«Natural» orders indifferent to cultural and social historical environments, but open to experimentation.*

Figure 4. *Socio genetic Theoretical Trends B.*

Trends B

P. Eisenman, Social Housing, Berlín, 1985.

Ch. Alexander's Eishin campus, largely completed in 1990.

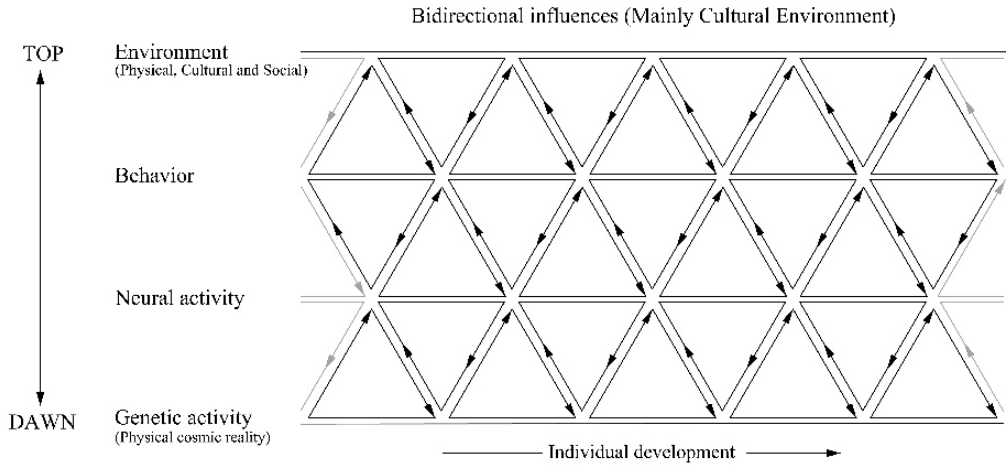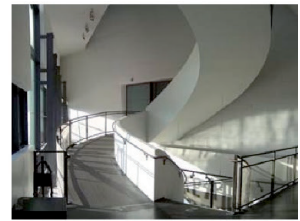**Figure 5.** *«Social» codes and Patterns.*

Bidirectional influences (Mainly Cultural Environment)

TOP

Environment
(Physical, Cultural and Social)

Behavior

Neural activity

DAWN

Genetic activity
(Physical cosmic reality)

Individual development

Figure 6. *Topogenetic Interactions, Trends C.*

Trends C

F. Ghery, Vuitton Center, París, 2015.

S. Holl, Kiasma, Helsinky, 1998.

Figure 7. *Crossing geography and social history of the places where buildings belong.*

Chapter Two How and When the Coaction Between Architecture and Semiotics Works

In order to arrive to a useful coaction between architectural and urban design and semiotics we need to share the same cognitive «place» where creativity and communication coexist. This is just the kind of probabilistic place where epigenesis develops according to Gottlieb and also the place from where Goethe could define the urbanistic quality of urban forms according to Mikhail Bakhtin[10]: just at the crossing point between design and history[11]

It is in this place that signs, symbols and meanings suffer from a chaotic behaviour between cognition and communication that we have described as an especial linguistic condition of «living inside the language»[12].

According with this especial linguistic condition, architecture is a force of «external construction» of buildings and cities, meanwhile verbal languages are «external forces of communication».[13] Also, and in a complementary way, verbal languages allow an «internal constructive thinking «and architecture allows for an «internal communicative process» hardly known. Very few philosophers have been able to analyse this internal communication. Pierre Kaufmann[14] has been one of them, and of course Plato and Aristotle.

When Mikhail Bakhtin defines the important phenomenon of «taking for granted» in linguistic verbal communication,

10. Bakhtin, M. M. *Speech Genres and Other Late Essays*. Trans. Vern W. McGee. Austin, Tx: University of Texas Press, 1986.

11. Muntañola, J. La Topogenese, París, Anthropos, Paris, 1996.

12. Saura, M.; Muntañola, J.; Mendez, S.; Beltran, J. *Living inside the language: architecture, education and society*, International Conference, Purlpsoc, Viena, 2015.

13. Muntañola i Thornberg, Josep, *Las Formas del tiempo: arquitectura, educación y sociedad*. Badajoz, @becedario, 2007

14. Kaufmann, P. *Qu'est-ce Qu'un civilisé?* Cahors, France: Atelier Alpha, 1995.

he is pointing to the necessary link between the external and the internal communicative processes, where sciences, arts and politics work together.[15]

Epigenesis is, in this case, a good paradigm of what Jonas Langer,[16] developmental cognitive psychologist from Berkeley, defines today as a «third developmental cognitive, pronge» that cannot be detected in real space and time subjects.

A good study case for the detection of this coaction is the PhD program of semiotics and architecture in the school of architecture in Tunisia. Thanks to the French professor Alain Renier,[17] who worked there several years before his death. This PhD program has coacted with the school of architecture and has introduced semiotic procedures in teaching and research. (Figures 8 and 9) are examples of this specific kind of coaction where the limits between architectural design and semiotic analysis of architecture remain open in a lot of ways.

In this case, the anthropological dimensions of the semiotics developed by Alain Renier is a key factor. According to Renier the fragmentation of architectural physical space is based on semiotic linguistic foundations, not in technical physical features, and it can be different for designers, students, users or politicians. Of course, this is known since Kevin Lynch[18] ideas, but the semiotic flavour of Alain Renier helps the designer to be user and

15. Hutchins, Edwin. *Cognition in the wild*, Cambridge, Massachusetts: MIT Press, 1995; Alva, Noë. *Tools: Art and Human Nature*. Hill and Wang, 2015.

16. On line <http://psychology.berkeley.edu/people/jonas-langer> and Langer, Jonas. «Early Cognitive Development: Ontogeny and Phylogeny», en J. Connolly & J. Valsiner, *Handbook of Developmental Psychology*, (p. 141-171). London: SAGE, 2003.

17. Renier, Alain. *Espace, représentation et sémiotique de l'architecture*, París, Editions de la Villette, 1989.

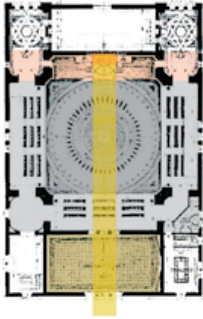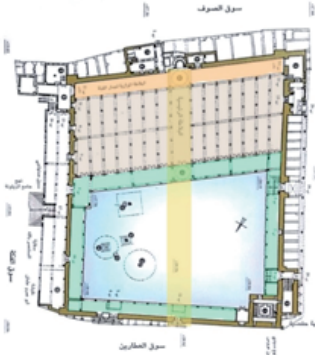18. Lynch, Kevin, *The Image of the city*, Cambridge: The MIT Press, 1960.

the user to be designer, making the relationships between cognition and communication more explicit.

In our PhD program in the Barcelona Polytechnic University we have analysed the relationships between design and history in several dissertations in order to arrive to similar results. We have no place here to develop the coactive process, just see (figure 10, 11 and 12) where the space syntax computer analyses of a urban old form uncovers the social cognitive structure of it, already forgotten for users, but «surviving» bellow the physical construction of today, giving meaning to the whole form and making the relationships between design and history explicit in a new way.

Figure 8. *In the dissertation by Imen Regaya.*[19] *The ritual between members the family is analysed with the syntagmatic semiotic chains defined by Alain Renier.*
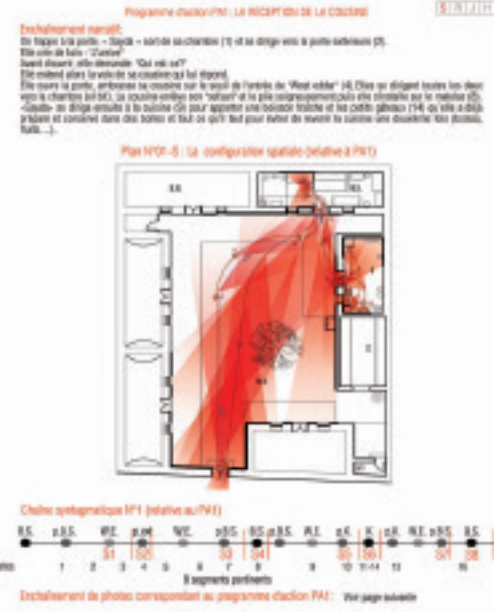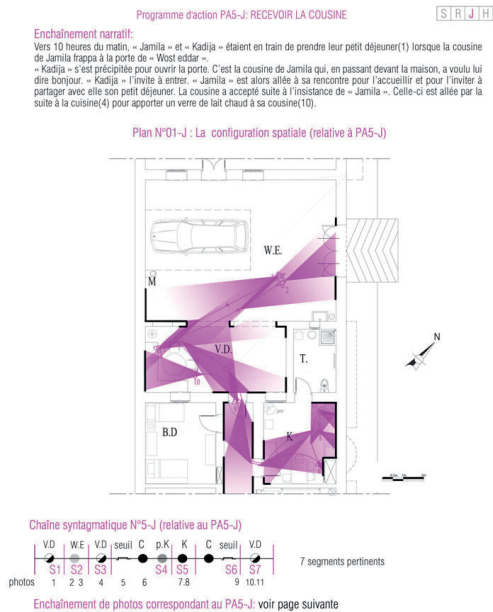
19. Imen Regaya, «Spatial Behaviour and the Socio-Spatial Recognition», in ARQUITECTONICS 30, Barcelona, Edicions UPC, 2017.

OB1 : La Grande synagogue d'Osiris à Tunis	OB2 : La Grande Cathédrale Saint-Vincent-de-Paul	OB3 : La Grande mosquée Ezzitouna
Extérieur	Extérieur	Extérieur
Echelle métrique : 0 5 10 15 20 mètre	Nord ←	Echelle métrique : 0 5 10 15 20 mètre	Nord ↑	Echelle métrique : 0 5 10 15 20 mètre	Nord ↙

Sujet parcourant / Objet espace ou « *topos*»

Relation entre sujet et objet : Conjonction ou disjonction
(pertinence/indifférence)

Figure 9. *In the PhD by Ferida Sellem, the spatial organisations of three main religions are analysed with the semiotic structure by A. J. Greimas, about the narrative structure of human communication.*
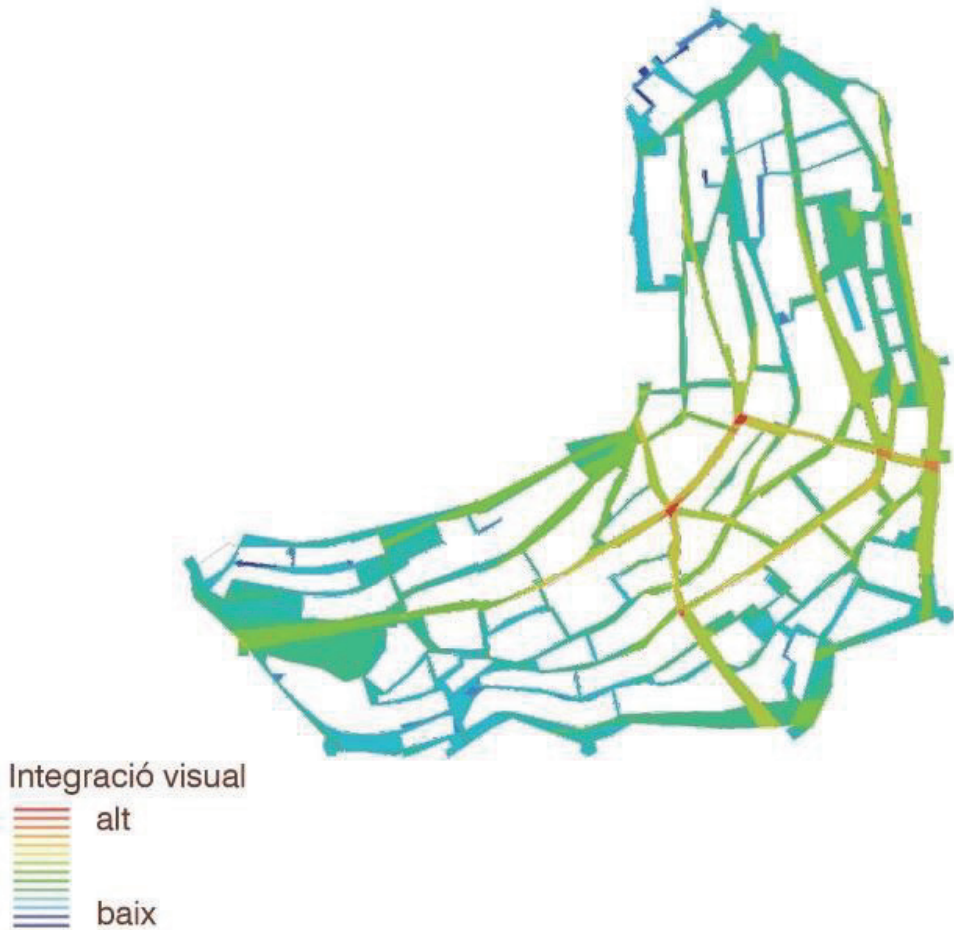
Integració visual
alt

baix

Figure 10. *This figure shows an interesting case of embedded memory. The red point in this figure is the historical record of a door in the wall of the medieval village of Morella in Spain, lost for the memory of the inhabitants and for the present explicit configurative social knowledge. The door obviously exists on the underground, but without exterior visual signs. Historical documents will explain the whole transformation, but it is relevant that the form has the record by itself and that in can be uncovered by the space syntax analysis.[20]*

20. Saura, M.; Beltran, J.; Pakseresht, S. «A cross-cultural, comparative morphology-study of two composite cities: courtyard design in Barcelona and Kermanshah» in *Rethinking, reinterpreting and restructuring composite cities*, Cambridge Scholars Publishing, 2017.
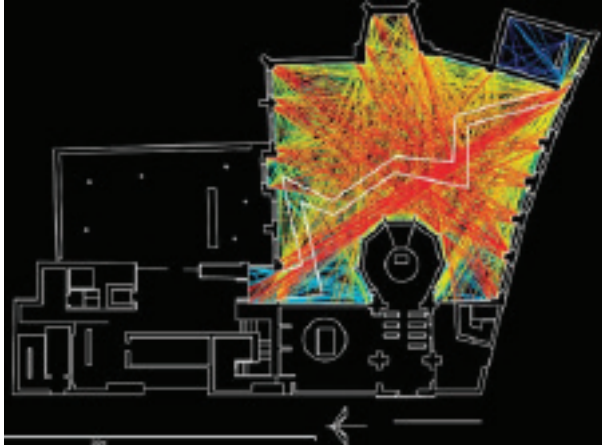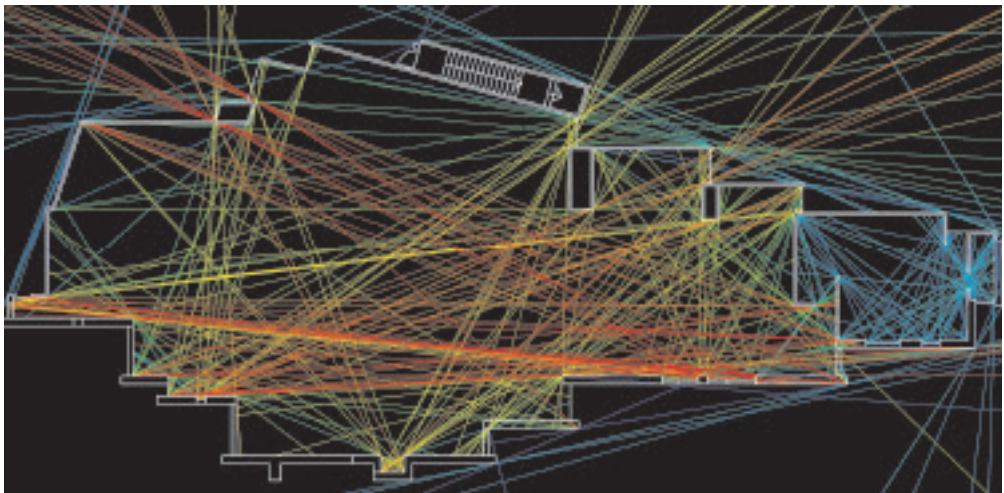
Figure 12. *Space Syntax analyses of the church of Männistö by Juha Leiviskä, in Kuopio, Finland (1986-1992). The red horizontal line coincides with a step in between the altar and people looking at the ceremony. A nice feedback between experiential and virtual realities.*[22]

21. Martínez, J. N. «Materialización de la memoria real y proyectada» in ARQUITECTONICS 30, Barcelona, Edicions UPC, 2017.

22. Muntañola J., Saura, M.; Beltran, J.; Méndez, S.; Martínez J. N., Molarinho Marques, S. «The configurative knowledge of architecture: from childhood to adulthood uncovered by the space syntax analyses», 11th International Space Syntax Symposium, Lisbon, 2017.

Chapter three. - Provisional Conclusions: Architecture and Planning as Semiotic Processes

Either at a level of design as a prefigurative process, or in relation to the configurative meaning of the construction of cities or buildings , or, finally at a level of the use of architectural and urban spaces , the theoretical problems about what is the meaning of these classical dimensions of architecture as human processes, remains.

And, most important, the difficulties are the same in these three dimensions because they share the same probabilistic interactive epigenetic character. Then this character points out to the same contextual key factor common to them that Mikhail Bakhtin described in his known dialogical last written text in 1973 some months before he died. (See annex l) Figures 1 to 7 are in fact a representations of the semiotic and epigenetic ideas of Bakhtin. The coaction between semiotics and architecture is a probabilistic coaction, where cognition and communication share the same game coming from different dimensions of the human mind but, at the end, coexisting in a simultaneous place.

Works by Edwin Hutchins,[23] Alva Noe[24] or Bruno Latour are opening a new way for a comprenhensive and holistic view upon architecture and planning. It is not strange that a lot of books analyse today the common ideas between Lewis Mumford and Mikhail Bakhtin, so far and so close one to the other, but both where epigenetic at a very different cultural view point and context,

23.Hutchins, Edwin. *Cognition in the Wild*. Cambridge, Massachusetts: MIT Press, 1995.
24.Noë, Alva, *Out of Our Heads: Why You Are Not Your Brain, and Other Lessons from the Biology of Consciousness*, New York, Paperback, Hill & Wang, 2010.

and both were also aware of the sociophysical articulations of the human live and of the human history.

The architectural design, the construction and the use of cities and buildings are processes that share the same epigenetic relationships between objects and subjects, «hosts» and «guests», and finally between architectures and the semiotic meanings between subjects. Semiotics can help architects to take the necessary distance form themselves in order to design, to build and to use the cities, enlighted by a semiotic view point where the unique inhabitants are not only the architects themselves, or the Architect who designs, but, as Alvar Aalto suggested «the human beings from the street», and, we insist, also «the common revolted human condition». It is not much but is enough.

Finally we reproduce here the final statement by Allan Penn, chairman of the school of architecture at the University College, London that was an abstract of his lecture in Barcelona in 2015:

«This lecture reviews what has been learned through 'space syntax' research about the relationship between the morphology of the environment, human behaviour and social use. From this background it reflects on the role of computation in research and design, and the implication of this for the education of architects. It argues, rather than thinking that the mind must be extended beyond the body, that the built environment takes on structure through design that in turn is learnable and learned by human minds. It proposes that architecture may offer an important mechanism through which social forms and cultures 'get inside people's heads', and so transmit from generation to generation».

Annex One

From the «Concluding Remarks» were written in 1973 by Mikhail Bakhtín[25]

...«As we have already said, there is a sharp and categorical boundary line between the actual world as source of representation and the world represented in the work. We must never forget this, we must never confuse – as has been done up to now and as is still often done – the represented world with the world outside the text (naive realism), nor must we confuse the author-creator of a work with the author as a human being (naive biographism), nor confuse the listener or reader of multiple and varied periods, recreating and renewing the text, with the passive listener or reader of one's own time (which leads to dogmatism in interpretation and evaluation). All such confusions are methodologically impermissible. But it is also impermissible to take this categorical boundary line as something absolute and impermeable (which leads to an oversimplified, dogmatic splitting of hairs). However forcefully the real and the represented world resist fusion, however immutable the presence of that categorical boundary line between them, they are nevertheless indissolubly tied up with each other and find themselves in continual mutual interaction, uninterrupted exchange goes on between them, similar to the uninterrupted exchange of matter between living organisms and the environment that surrounds them. As long as the organism lives, it resists a fusion with the environment, but if it is torn out of its environment, it dies. The work and the world represented in

25. Bakhtin, M. M. The Dialogic Imagination: Four Essays. Ed. Michael Holquist. Trans. Caryl Emerson and Michael Holquist. Austin and London: University of Texas Press, 1981, pp. 243-258.

it enter the real world and enrich it, and the real world enters the work and its world as part of the process of its creation, as well as part of its subsequent life, in a continual renewing of the work through the creative perception of listeners and readers. Of course this process of exchange is itself chronotopic: it occurs first and foremost in the historically developing social world, but without ever losing contact with changing historical space. We might even speak of a special creative chronotope inside which this exchange between work and life occurs, and which constitutes the distinctive life of the work.»...

Glossary

Epigenesis A.A. Uxtomskij lectures in 1925 have a huge impact in Mikhail Bakhtin dialogical theories about art and literature. We refer to the seminal work of Gilbert Gottlieb one of the best epigenetic theoreticians who died in 2006. (Pages 1, 2, 3)

Cognition and communication. A known and difficult subject in relation to semiotics of architecture. We argue about the specific dialogue between cognition and communication that is produced inside the architectural and urban design processes. Attempts to represent them have failed. (Page 5)

Spatial cognition and social interaction. In relation to the coaction between cognition and communication we explain the impact of social interaction on it and the significance of the use of abstract networks, such as spatial syntax at this point. (Page 6)

Semiotics and architectural design coactions. We intent to analyse when, why and how this coaction is

positive and improve the understanding of both sides, the architectural design and the semiotics of space and time. (Pages 7, 8)

Images References

Figures 1-7, by authors and stock images

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