Spatial Syntax and the Poetic Spatial Link in Architecture and Planning

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Abstract

Can Space Syntax uncover the poetic spatial link in architecture and planning? In Lisbon in 2017 we uncover one emergent interest upon the not clear interrelation space syntax configurative structures, the design prefigurative power of architecture and the social science refigurative studies about of the environmental behavior of social human groups or cultures, (Ricoeur, 2003). Following Bill Hillier himself this interrelation is significant from the Space Syntax understanding and for architectural planning analysis (Hillier 2014: 214):

> «Cities appear to us as patterns of activity related to patterns of space. (...) But theoretically it is not like that, and this is not how cities become as they are. This is why good city form can adapt easily to new patterns of use.»

Thus, according to Hillier the physical space is a link both between the type of activity that that develops in the urban scenarios, and social co-presence shaped by the physical space itself. This constitutes a key critique to Alexander's pattern language. The present contribution shows an example in downtown

Barcelona of the feedback between prefiguration, configuration and refigurative surveys (Authors). Methodologically, ethnographical surveys in the Raval neighborhood analyzed by Space Syntax tools confirm the need for the horizontal red lines by dwellers. Findings show that the proposal by Clotet, which was partially implemented, disregarded these accessibility links in contrast to the past and present situation. This is a poetic combination of morphological (Space Syntax) and ethnographical simulations linked by design processes.

Keywords

Space Syntax, poetics of space, ethnographic survey, simulation, morphological analysis

Theme

Architecture

Architecture spatial theory Space Syntax and architectural design

Chapter One the Theoretical Background of the Space Syntax Analyses

Space syntax has a very useful theoretical background for designers if it is deeply understood. Pitifully this is often not the case. Bellow an apparent simply tool for city forms simulation and behavioral analyses, Bill Hillier has developed a very interesting theoretical challenge to designers explained in several key works along a lot of years of research.

We cannot here investigate all these theoretical analyses that sure will be done in the next years, but we can

point out some key aspects of them in relation to our proposal about the poetic power of the space syntax analyses and simulations.

The following arguments by Bill Hillier define these main aspects:

«We have shown how cities are constructed as gradations of integration and segregation and have suggested that patterns of activity are shaped by the urban grid...» (Hillier, Vaughan 2007)

«On the first, space syntax shows that in cities and building alike, the relations between form and function passes through space, and more precisely, through the patterning or CONFIGURATION of space...so the space syntax opens the way to a design level theory, non-deterministic but rigorous, of how buildings and places respond to, and shape, human activity, that is how function shapes form and form shapes function»

«The relation between scales; that how local places arise in cities depends as much on how it is embedded in its larger scale context as in its intrinsic properties.» (Hillier 2005)

«The relations between form and function in cities are GENERIC not SPECIFIC»

«Cities appear to the designer as specific pattern of activities related to specific patterns of space. But this is not like that and this is not how cities become as they are. Space is created not directly by the inter-related demands of specific activity patterns, but INDIRECTLY BY THE DIFFERENT DEMANDS THAT KINDS OF ACTIVITIES PLACE ON THE MOVEMENTS AND CO-PRESENCE that is created by space. This is why good city form

can adapt easily to new patterns of use...» (Hillier 2014)

«We need to find a bridge between the social and the physical which is at the same time the bridge between the local and the global»

«Certain laws of space are common to mind and world»

«The human and social content of our environment from which we live comes from the way our experience and understanding of space become built into the way we act in the world»

«In a deep sense space has not only agency: it causes the city to come to its existence» (Hillier 2005)

Then, from these points of view, neither the configurative morphological analyses of the cities, space syntax and others, nor the ethnomethodological re-figurative studies about the behavior of people in social environments, can be a substitution of the design practices by architects, planners, and other professions. From the beginning, and taking a very different starting point concerning Christopher Alexander, Bill Hillier wanted to help designers and users not to eliminate their pre-figurative or con-figurative practices. Art and science coexist in the city, and he never intended to fight against designers. Also, Hillier believes that the space syntax analyses, the sociological studies, and the urban forms histories can be coactive and complementary in a lot of ways, some of them still to be done.

The definition of a «generative» spatial knowledge in the environmental behavior studies, defined by Bill Hillier above as a «Specific activity in specific places linked to specific co-presence in social environments», is

extremely close to the poetic definition of human spaces in general and enters in the huge discussion today about spatial cognition from different disciplines. This poetic component has to be understood in a classical Aristotelian way, as productive and generative feedback in between the active and socio-physical spatial «peripateia» and an also socio-physical spatial «recognition.» They are linked by the chronotopic dialogical structures present in our culture. (Muntañola J.2009) (Muntañola J, et alt.2018) (Muntañola J.et alt 2017a) (Kirsh D et alt 2000) (Zimmermann R.E.2015) (Zimmermann R.E, Koutsandrea K. 2017).

However, this poetic prefigurative power of design has limits too, because the forecasting of new architectures is limited to different points of view: technological, social and mental. The advantage of poetics as a «possible» event not historically existent announced by Aristotle, belongs to the human spaces in general and points to the need for differences between representation and what this representation means. When these differences disappear, representation is useless, as we can now see in the key fields of informatics and forensics. When digital representations equal physical objects, and there are no ways to find if the content is virtual or real, then, we arrive at a «Blackhole.»(Rothman J. 2018)

The specific components of this poetic capability of the human spatial cognition, as we indicated above, are the kernel of a complex discussion today. Let us start with the definition of space syntax significance by Alan Penn in a lecture in Barcelona in 2016:

«My lecture reviews what has been learned through space syntax research about between the morphology of the environment, human, 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 can offer an important mechanism through which social forms and cultures `get inside people heads´ and so transmit from generation to generation».

Concerning this spatial cognitive power of designers, the work by David Kirsh (Kirsh d et alt 2000 and Kirsh D. 2018) is significant. Starting from the definition of a «distributive social cognition» he is arriving to the conclusions of a «different way of spatial cognition by designers», where a «spatial and social reflective cognition» can produce feedback between social use and the physical form where this use exits, that is, standing in a very close position to the Bill Hillier ideas. Moreover, Kirsh states that neither the computer cognitive interaction simulation nor the networking between human actors has been able to simulate this spatial cognitive and social power of the design processes.

From a different viewpoint but working in similar problems, the last book by Ole Moystard, (Moystard O.2017, 2018) points to a semiotic spatial structure aiming to an explanation of the architecture role in our minds. In a last recent communication he defines, after Kevin Lynch pioneer ideas, the «spatial image» allowing people to «navigate» in the cities, and giving to this image all the complexities defined by Bill Hillier, that is dynamic, versus static, the physical versus social, the background versus the foreground.

In an opposite position, against both Kirsh and Moystad, the article by Lizardo et alt (2010) states that this «image» does not exist, and that representation and language are unnecessary concepts since people «navigate» only thanks to skill, networks of actions socially

understood consciously or unconsciously. Representation and imagination are traditional concepts that in our times can disappear.

Finally, the recent work by Steets S.(Steets .S.2016) reconsiders the classical concepts of the symbolic interaction theories, and gives to the «spatial, social image» some deep social interactive processes, pointing more to the works by Kirsh and Moystard, that to the ideas by Lizardo.

This discussion could arrive at a lot of diverse research scenarios, such as the biogenetic architectures, (Muntañola J et alt .2017a) or to the urban planning theories by Richard Sennett (Sennett R, 2018) but as we have already discussed, many studies are in need in order to know the mutual impact of these scenarios and the space syntax significance. In this contribution, we will keep into a more specific cognitive and hermeneutic scenario, related to our contribution to the previous international conference of space syntax in Lisbon in 2017. (Muntañola J et alt 2017 b)

If we go now back to the important paper by Hillier in 2005b «Between Social Physics and Phenomenology,» we can uncover the huge theoretical potential and the weakness of the situation, both are related to the theory of systems analyzed now by Rainer. E. Zimmermann. In more defined words, the dialogue between social physics and phenomenology ends in a set of questions about how can space syntax be mathematical without being deterministic, so beyond a «phenomenology one» and a «phenomenology two», Hillier is proposing a «phenomenology three», able to solve the same problem that E. Kant was working on the last ten years of his existence: The gradient between the physical and the mental, and the relationships between the emergence of the subject and the emergence of the social and historical world. He died before some clear phenomenological solution

emerges, but his last text Opus Posthumous is full of ideas very similar to the ideas by Hillier. (Silvia de Bianchi 2009)

We propose now to go to this «phenomenology three» that we think is well represented by the Paul Ricoeur ideas, that we have been working on in the last years, and that can be the bridge between the «social physics» of space syntax mathematical analyses and the «social physics» of the «ethnological social physics». The city is then the bridge, but not only a mathematical bridge but a poetic and political bridge too.

In one of his biographic last books, Lewis Mumford (Mumford L 1979) quotes Max Scheler: «The geometric order, in which every extensive transformation of matter and man lies, at the beginning of which we are standing, can scarcely be overestimated, it is not only a transformation of matter, circumstances, institutions, the fundamental ideas and form of the arts and nearly all of the sciences, it is a transformation of man itself, of the character of its inner construction, in body, instincts, soul, and spirit; it is not only a transformation of his actual being but also a transformation of his standards…»

(From «Letters to Germans in Values for Survival in 1946)

We think that the hermeneutic philosophy of Paul Ricoeur contains one of the best explanations of the intercrossing of history and fiction and real and virtual worlds, and what here happens. Diagram I and II represent, in abstract, the way the content of his last books. (Ricoeur P., 2004; Ricoeur P., 2003).) The three axes of diagram I represent the three hermeneutic dimensions of the human knowledge, the pre-figurative level or the poetic power of our imagination, of the design in our case; the configurative power embedded in the buildings and cities; and, finally, the re-figurative power of the

use of buildings and cities already built, able to transform permanently the meaning and the social use of architecture and planning. Moreover, Diagram II shows the correlation, in the human space and time existence, of the written time in language and the built space in architecture and planning, both link physical and social dimensions of the same human life, but one through temporal human order, the «calendar», and another through human spatial order, that is, the «space of the architect» according to Paul Ricoeur.
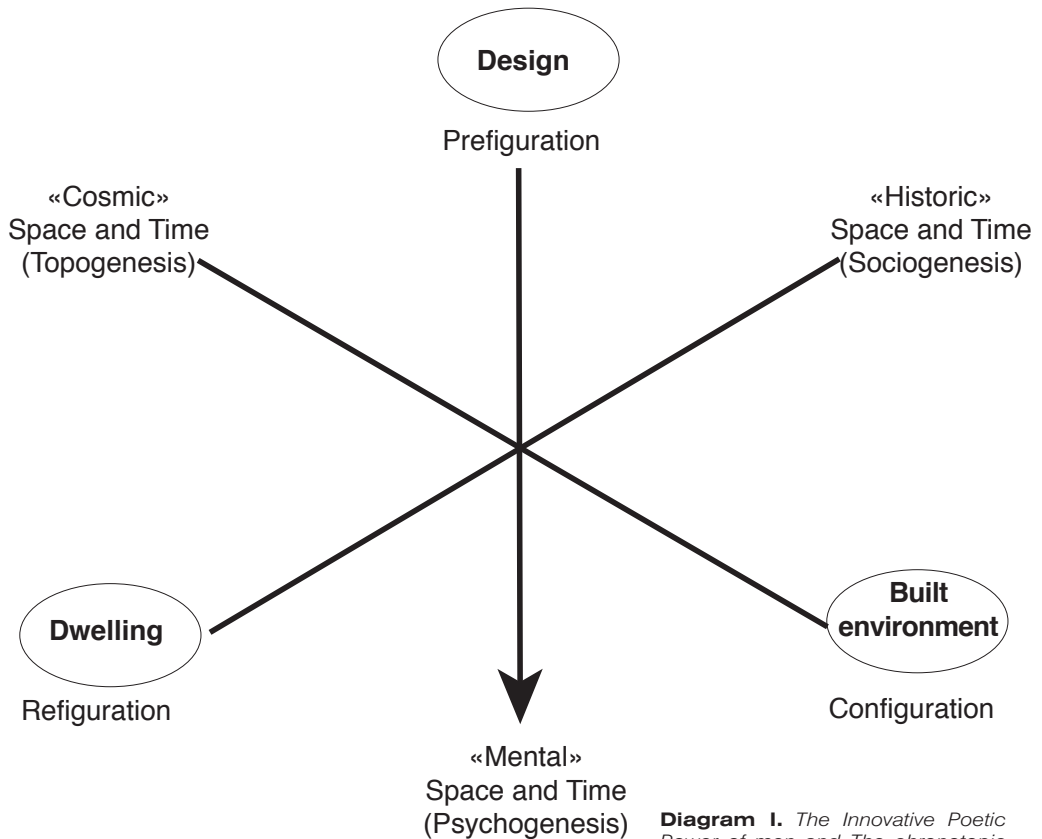
Design

Prefiguration

«Cosmic»
Space and Time
(Topogenesis)

«Historic»
Space and Time
(Sociogenesis)

Dwelling

Refiguration

**Built
environment**

Configuration

«Mental»
Space and Time
(Psychogenesis)

Diagram I. *The Innovative Poetic Power of men and The chronotopic structures (In Paul Ricoeur 2003).*
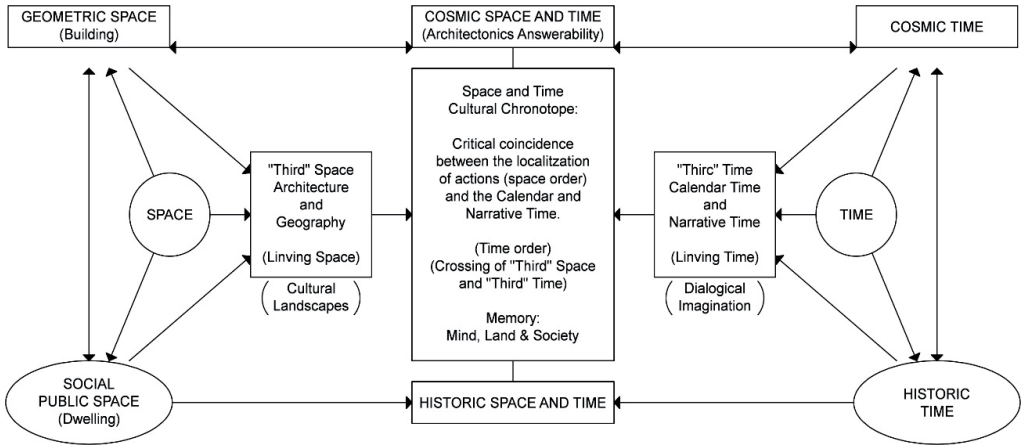
Diagram II. *The Space and time HERMENEUTIC Correlations by Paul Ricoeur (Between the Calendar and the Space of the Architect).*
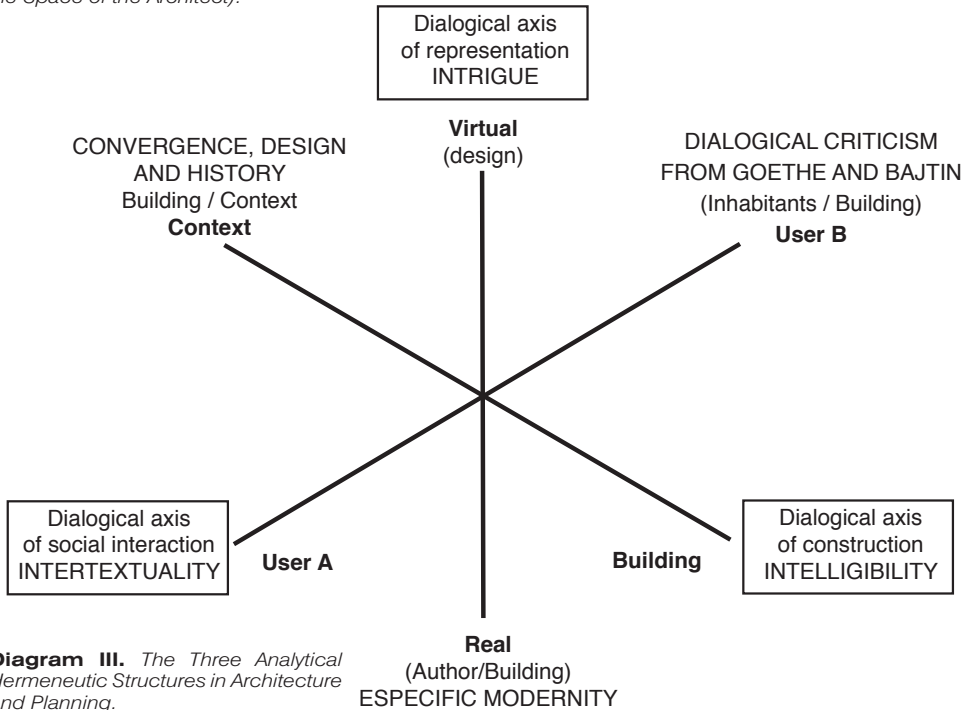

Diagram III. *The Three Analytical Hermeneutic Structures in Architecture And Planning.*

In diagram III we correlate the three hermeneutic dimensions of Paul Ricoeur with the three spatial orders defined in our arguments above: That is, the poetic prefigurative component of the human space, the morphological configurative knowledge (such as space syntax, Alexander patterns, etc.) and the refigurative ethnomethodological studies about environmental behavior in built places in general. Notice that human space demands a basic articulation between these three spatial orders. However, it cannot be only a scientific articulation, but an aesthetic and a political articulation too. Human space is, then, the final product, of the totality human system included in diagram III. The complexity of this final spatial human system is what professor Rainer E. Zimmermann is working on in his monumental study about The Foundations of the Human Life Systems. (Rainer E. Zimmermann 2015)That basic work is based upon the last spatial and mathematical studies of Jean Piaget(2010), and upon the works by Bill Hillier and Paul Ricoeur among others.

If we compare the three Diagrams I, II and III, the complementarity among these three spatial analytical approaches can exist, but each one should accept their limitations. The configurative methodologies uncover the relationships and the confrontations between design and social use in the place. As Bill Hillier points out, it is wrong to use design as a tool «against the city» instead to use the configurative power of a city as a foundation of its transformation with innovative and poetic design ideas. The confluence between innovative design and the historical culture of the place can be evaluated by the morphological simulation of the design transformations analyzing the impact of the local on the global, and of the global on the local changes.

In the refigurative mythological analyses, the ethnographic studies uncover the positive and negative

correlations between the design proposals and the building meanings and uses of the dwellers. Good ethnographic studies show the social kernel of built spaces when specific actions need specific social participation and produce specific meanings. Sometimes designers forget about them, sometimes the built environment is used by people with social needs confronted with the physical simulation involved in the design processes. So ethnographic studies uncover psycho-physical pathologies, between prefiguration and configuration, where morphological studies uncover psycho-social pathologies between refiguration and prefiguration, but altogether, they uncover the general human fitness of cities and landscapes, never perfect and always in continual evolution. The poetic knowledge, in the meanwhile, uncovers the possible link, in confrontation or agreement, between physical morphologies and social ethnographic needs, through an always-evolving equilibrium between permanence and change, and foreground and physical background configurations and social needs.

AA Aristotle advises sometimes we go too fast other too slow, in both cases spatial human, poetic synchronicity is lost, and we support pathological spatial behaviors instead of life.

Chapter Two Barcelona Raval Case Study

In a very abstract way we present en the following diagrams IV, V and VI, in a very brief way, a case study, Several Ph.D. Dissertations are following a similar theoretical structure in different places and cultures, but they need time, as Aristotle indicated.

In a Barcelona correlated with the coming Olympics games in 1992, fundamental urban transformations were proposed. Diagram IV is the space syntax in the

Raval, in the old city, before any transformation in 1987. Diagram V is the city after the design proposal, is then a simulation of the design impact in the city if it were built entirely. Diagram VI is the actual space syntax today after the implementation of the urban proposal of Diagram V, where the differences between what was before are clear enough, but where the differences with the simulation of the impact of the urban proposal are clear too. The student who makes the study did ethnographic surveys of the users, inhabitants, and tourists, and found, as Bill Hillier points out, some resistance of change in the residents that cannot be evaluated as «no change» only, but also as a «different kind of change». We can just select an effect of the urban proposal, when the design transformations included an increasing vertical accessibility changing the historical prevalence of the horizontal accessibility, with the MACBA building of Richard Meier, and new open spaces, it implied a sharp destruction of the previous horizontal accessibility (Diagram V), that was criticized at the time by several international studies (Muntañola J. 2008) because this produced social deprivation at the limits of the proposal. Many proposals were step by step modified in order to equilibrate the final stage, that is Diagram VI where a new equilibrium between the horizontal and the vertical accessibility is obtained, in between the new and the old, just as Bill Hillier predicted. Designs were changed in order to allow horizontal historical conations to work. Just now a big rehabilitated new market center near the old wall in the Raval has increased a lot this horizontal link necessity.

Diagram IV. *Barcelona, El Raval, Real original situation, previous to 1980.*

Diagram V. *Urban proposal by Lluis Clotet, 1981.*
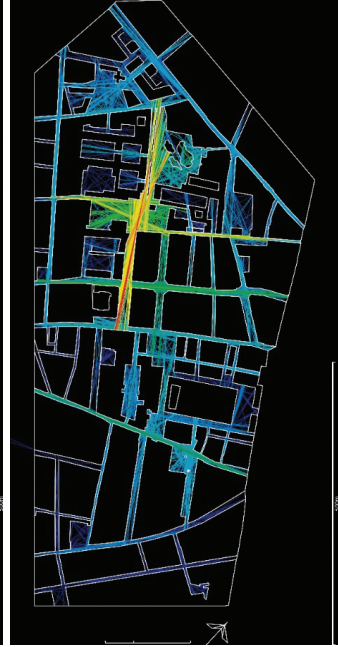
Diagram VI. *Barcelona, El Raval, Actual present situation, 2018.*

The description of the diagrams IV, V and VI bears a lot of information if we know the social and historical context. The previous situation in diagram IV analyses of a configuration of an old city after thirty years of dictatorship regime by Franco and democracy needed a fast intervention in order to renew the urban life.

Barcelona has always work in horizontal links because commercial interactions needed them. The link with the sea was less important with the exception of the Las Ramblas main public sea link. Historically, Barcelona has not a natural and vital port, so

this explains the paradox, near the sea but isolated from it.

However, in the same diagram IV can be seen that the vertical accessibility between the horizontal red lines exists, but not in a continuous way, but with short vertical strong links. These are also significant elements of the mobility in Barcelona where the local specific character can be essential for the global configurative frame.

The design proposal by Clotet bears important new ideas and shows some strong intentions of renewal. Links with the outside of the old wall increased by new institutional buildings,(the MACBA by Richard Meier) and new public squares «opens» the old city to modernity, and increases the public new life and safety in poor areas. However, the simulation of diagram V uncovers global impact in some vertical and horizontal lines that go against the ideas of the design itself. Neither Clotet nor the city hall experts never saw this simulation. This is the main point of the Bill Hillier proposal if the designer knows the impacts in the space syntax simulation he can have new ideas and better solutions.

Can be surprising that the last diagram VI is more similar to the first historical situation than to the simulation. This is not only because some aspects in the original project were modified through the years, but also because new projects not included in the first plan were added, as the transformation of the main Market of La Boqueria, the heart of the whole area and essential centre of activities.

It is interesting to see that the main red horizontal lines eliminated by the urban proposal are maintained, and also the vertical important red line, but it loses accessibility. The vertical main line, at the top, increases

accessibility but results articulated with the main hori-
zontal line. The ethnomethodological social surveys to
residents and users show the need for the vertical and
horizontal mobility, and most the articulation between
both in the public squares, fact that sometimes does not
happen. This need, of course, a microanalysis that can-
not be done here.

A very polemical and complex fact starts at this point.
The intention of the whole plan was pacification and
renewal of traditional areas full of violence and social
pathologies. The situation in many streets in the areas
not only does not improve but it is today worst than be-
fore. Of course, we have analysed the FOREGROUND
regarding accessibility, if we go to the social BACK-
GROUND the scenario is different. It is not only because
there is a «resistance « to change because the original
dwellers are gone, But It is also because the new
healthy social life has not developed in any way since
social pathologies follow and in some streets increased.
Some studies have analysed the profound social and
political dimensions of the problem, (Muntañola J.2008)
but in between gentrification, that failed, and a healthy
social improvement the path is very narrow. Touristic
use increased, but violence remains. Microanalyses of
concise links in the deep social residential background
and social ethnographic surveys are extremely need-
ed, but this implies a new research work, involving res-
idents, owners, political policies, etc. Something is
wrong, very wrong, at a micro scale. Some signs of this
were already pointed out in some works quoted here.
(Fernandez D. 2014)

Chapter Three: Conclusion

In relation to the diagrams I, II and III, the diagrams IV,
V and VI point to a dialogue between the axis of dia-
gram III, and not only between sociophysical and

socio-phenomenological theories. The key point here announced both by Bill Hillier and by Paul Ricoeur, is the power of «new ideas,» or of «new ways of the human imagination,» in order to build, or to write, new human worlds for the future of humanity.

The rigorous laws able to represent this three-dimensional dialogue implied in those diagrams should have a chronotopic emergence nature, in the form of space and time socio- physical structures. To «design» these structures demand an interdisciplinary and inter-theoretical work in between morphological experts, socio-ethnological experts, and designers, each one acting from their specific knowledge and skills, Sciences, Arts and Political, human expertise, will be needed too.

As Bill Hillier suggested, the combination between space syntax theories and the phenomenological special studies can help to the understanding of how human cities work, and the complementarity and mutual reinforcement between these three different hermeneutic views could uncover better the complexity of human physical places. Some old ideas by M. Bakhtin (Bakhtin M. 1990) and some recent ones by R. Sennett. (Sennett R 2018) And by J.Muntañola (Muntañola J.2017), Magnaghi A, (2011) and Zarate M, (2015)are going in the same direction. However, we have a long way to go.

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