

The Ghost of 'Conceived Space'

What Kind of Work Does or Should Space Syntax Perform for Architecture?

Sophia Psarra

University of Michigan, USA

Abstract

The main thrust of space syntax is in defining architecture in spatial rather than conceptual terms bridging through the notion of configuration between abstract and lived space. Configuration defines non-discursive rules we use unconsciously in space as we encounter it in everyday life. While vernacular architecture is based on the unconscious normative rules defining the cultural competence of society (Hillier, 1996), and cities are emergent phenomena of overlapping situated practices (2001), architecture raises non-discursive patterns of space to abstract comparative knowledge (1996). Yet, the theoretical distance of space syntax from conceptual ideas used by architects and theorists not only limits its interaction with the frameworks of thought by which buildings are discussed and designed, but also disguises through the notion of non-discursive rules some of its own assumptions. These assumptions carry implicit notions of 'conceived' space as we conceptualize it through architectural history, theory and practice. If architecture is not solely founded on non-discursive rules, how can we re-consider the relationship between space syntax and architecture? The paper is structured in three parts: The first part reviews ideas about space developed by key architectural theorists and historians. It suggests that architectural discourse defines architecture as a conceived system of formal relations, theoretical ideas, contextual influences and their historical evolution. On the other hand, most of space syntax research approaches architecture mainly as a perceived system of non-discursive relations. The second part examines certain theoretical and analytical concepts in space syntax arguing that they sustain a theoretical division between conceived and perceived space, and the fragmentation of architectural discourse into analytic and discursive theories. The third part argues that the judgment we make that a building is architecture is founded on analytic knowledge of configuration, historical knowledge of spatial forms and theoretical knowledge that is discursive in nature. If space syntax intends to be useful to the study of architecture, it needs to address non-discursive and discursive knowledge within which architecture operates in its pursuit of social ends as well as innovation

Keywords: architecture; space syntax; architectural theory; space; form; discursive; non discursive; history and theory; conceived space; perceived space; innovation

1. Introduction

Space syntax studies the relationship between architecture and society defining space not as a background but as an integral component of social activity. But in spite of its contribution to architecture, its significance is not fully understood by architects and scholars outside the space syntax community. In spite of a vast range of applications in design and research, it is not a standard component of

architectural studies or the predictive processes in architectural practice. This paper argues that the distance between space syntax and other forms of architectural scholarship lies in the fact that its relationship to architecture has not been fully explored or theorized. In other words, we do not have a theory yet to explain the link between space syntax and architecture. The question addressed in this paper is twofold: first, what kind of work does space syntax perform for architecture that architectural theories do not? Second, what does it leave outside its consideration that can help strengthen its contribution to design?

This paper argues that the first reason for this theoretical shortage is because space syntax approaches architecture solely through an analysis of spatial characteristics and embodied experience. In contrast, architectural discourse focuses on how architecture is conceptualized through theories and formal relations. The second reason is because space syntax defines architecture as the *conscious* exploration of architectural possibility, and the city as an *emergent* global phenomenon, constructed through the distributed actions of situated practices and the *unconscious* description retrieval. As a result there is segmentation of architecture into architectural theories and a configurational theory, and of space into conceived and perceived patterns. The former refer to theoretical ideas and formal properties that are accessed consciously by the intellect. The latter relate to relations that become known to us unconsciously by living in space. The second division, operating between architecture and the city, implies a schism between the conscious mind of designers and the situated practices that make the city as a whole. This schism disregards an interstitial ground of individuals, social groups and institutions, such as architects, professionals and various bodies that are involved in the conscious production of spatial structures, while also participating in the unconscious patterns that define the city as an emergent phenomenon. Architecture is not simply a configurational activity and a property we see in built form (Hillier, 1996), but also a theoretical and professional practice based on academic and professional knowledge. Architecture and the city consist of space-time relationships between professional networks of discursive knowledge, and spatial networks based on non-discursive knowledge of configuration.

1. Spatial and formal properties

Space syntax addresses space in its 'primary experiential form' as the patterns, 'which confront us in the real world of everyday life' through the notion of spatial configuration (Hillier, 2005). Configuration describes relations among parts, which make up the whole. Knowledge of configuration is achieved in the process of creating and achieving spatio-temporal events and is non-discursive. Like language when we do not think about the syntax when we use it, configuration is employed intuitively as the part 'of the apparatus we *think with* rather than what we *think of*'. Configuration can embody and reflect social patterns that define the social competence of society, that is, the social knowledge through which culture recognizes its existence in space. But while configuration reproduces cultural patterns acting in a conservative way, it can also shape a pattern of movement and co-presence operating in a generative fashion (Hillier, 1996).

From the point of view of architecture, the idea of configuration as the unconscious spatial laws experienced by a peripatetic observer presents with a theoretical difficulty. This is because architects arrange not only spatial patterns, but also formal relations. These relations concern the geometric organization of elements that can be grasped synchronically regardless of how they are experienced in space-time. Although the two types of properties are different from each other, they are an essential part of architecture as experienced reality and as an activity concerned with relations of parts and wholes. The interaction between spatial and formal properties has been addressed through space syntax research in the past in an attempt to bring into the syntactic description notions of form and built shape (Hillier, 1996; Psarra, 1997; Peponis, et al., 1997; Psarra and Grajewski, 2001; Psarra, 2003; Peponis and Bellal, 2005). However, these studies did not grow to a widely applied analysis and did not achieve theoretical status. One of the main reasons for this deficit is that unlike space, form does not have a powerful impact on how buildings function for their social purposes.

However, form plays a central role in design and the ways in which critics discuss architecture. From Vitruvius to Alberti and Le Corbusier, we see substantiation of formal considerations not only in buildings, but also in the rich traditions of architectural scholarship and interpretation. Properties like bilateral symmetry coordinating elements on a plan, or public spaces with facades in a city are ways in which many spaces were shaped in the past expressing mathematical, religious or cosmological ideas. Form was also instrumental in the development of modern architecture. The early modernists associated form with the stylistic formalisms of history from which they sought to depart, striving for a different kind of formalism based on abstraction. Influenced by theories of decomposition, contemporary architecture has shifted away from form as a medium for humanist ideals, to form that is 'freed' from social signification. At the same time the development of technologies for computational design and digital fabrication enables either a mechanization of design typologies, or the production of forms that were previously unthinkable. The unparalleled development of theories and forms shows that the significance of form has not been reduced but exponentially intensified.

Yet formal order is no longer discussed laden as it is with failed utopian dreams of social order no longer considered relevant. The proposition put forward by certain theorists is that it does not bear on what architecture means, since meaning is indeterminate and socially produced subject to contextual histories, nostalgic symbolisms, multiple identities and freedoms (Tshcumi, 1999). Studies in space syntax demonstrate that the link between architecture and social life passes not through functions or forms, but through spatial configuration (Hillier, 1996). Seen together, these arguments leave us on the one hand, with architectural theories that isolate architecture from society splitting it between empty forms and social meanings, and on the other with a configurational theory that breaks architecture into an aesthetic and spatial practice. These theoretical divisions alongside the absence of a way to analyze form, are the starting reasons for which we need a theory and a method that interfaces space syntax with architecture, and spatial with formal relations. The intention in this paper is not to offer an analysis of form, but to examine the theoretical consequences of excluding architectural theories and form from the syntactic description.

Looking at the most influential approaches in the last century, one sees that the description of formal and spatial characteristics goes back to Wölfflin (1966), Frankl (1968), Wittkower (1971), and Rowe (1984). These historians diagrammed architecture according to spatial units and rhythms of bay structures. At the same time they examined how one comprehends relations based on embodied experience. Frankl suggested that the geometrical coordination of spatial centres in some buildings means that it suffices to see them from few points to gain a complete image. In other cases what we see varies as we change positions (1968). Rowe analyzed works by Palladio and Corbusier putting forward a similar distinction. From the cruciform hall of Malcontenta 'there is a clue to the whole building'. At Stein however, the regularity of the structural grid as opposed to the 'dispersal of focus' in the plan constructs a tension between the conceptual diagram and the experiential condition (1984).

A visibility analysis of Rotonda and Stein using Depthmap illustrates clearly these propositions [fig. 1a-b] (Turner, 2006). Palladio constructs a correspondence between the geometrical symmetry of the plan and the syntactic properties of the building. In contrast, Corbusier does not create a coincidence between the two systems. If this analysis is applied to Corbusier's Tokyo Museum, one sees again a dissociation of geometric centrality from the distribution of integration [fig. 2]. In the Barcelona Pavilion Mies employs a similar tension, this time operating in the opposite direction, from the apparent asymmetry of form to the almost symmetrical relationship of integrated to segregated positions [fig. 3.a]. Using an analysis of visual fields seen through reflective materials, I argued that Mies decomposes the volume into planes, but also constructs the perception of a unified space. This is because the reflections of elements occluded by the Onyx wall on its surface create the illusion of interpenetrating partitions [fig. 3.b] With the Onyx wall Mies 'erases' optical obstruction to the point that the dividing plane is not used to separate but to heighten the perception of a unified interior. By 'dematerializing' surfaces, he engages with the relationship between the intellect synchronizing space so that it can be grasped at once, and matter dividing space so as it can be seen only through movement (Psarra, 2009).

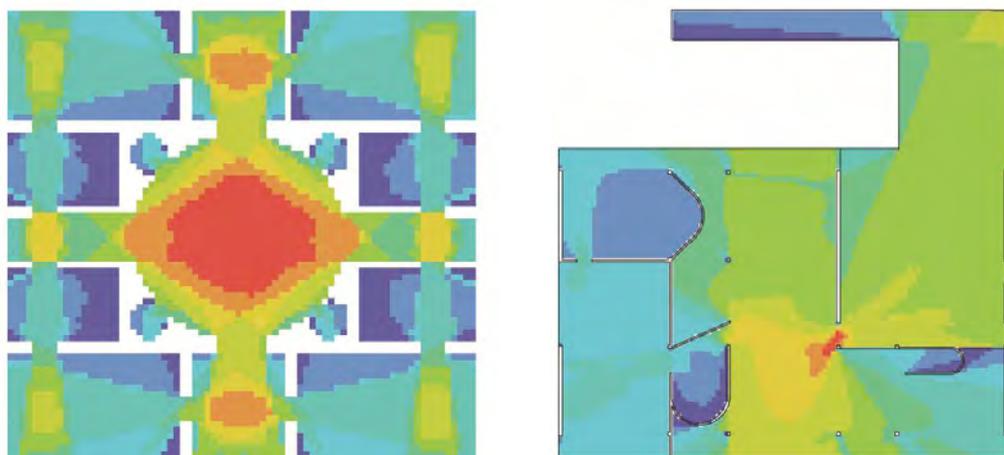


Figure 1. (a - left) Palladio - Villa Rotonda; (b - right) Le Corbusier - Villa Stein

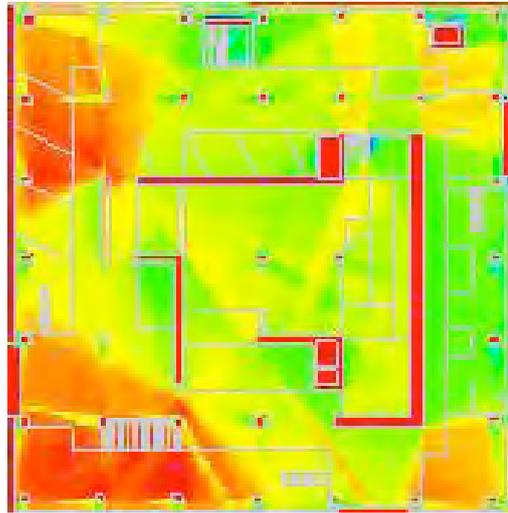


Figure 2. Le Corbusier - Tokyo Museum.

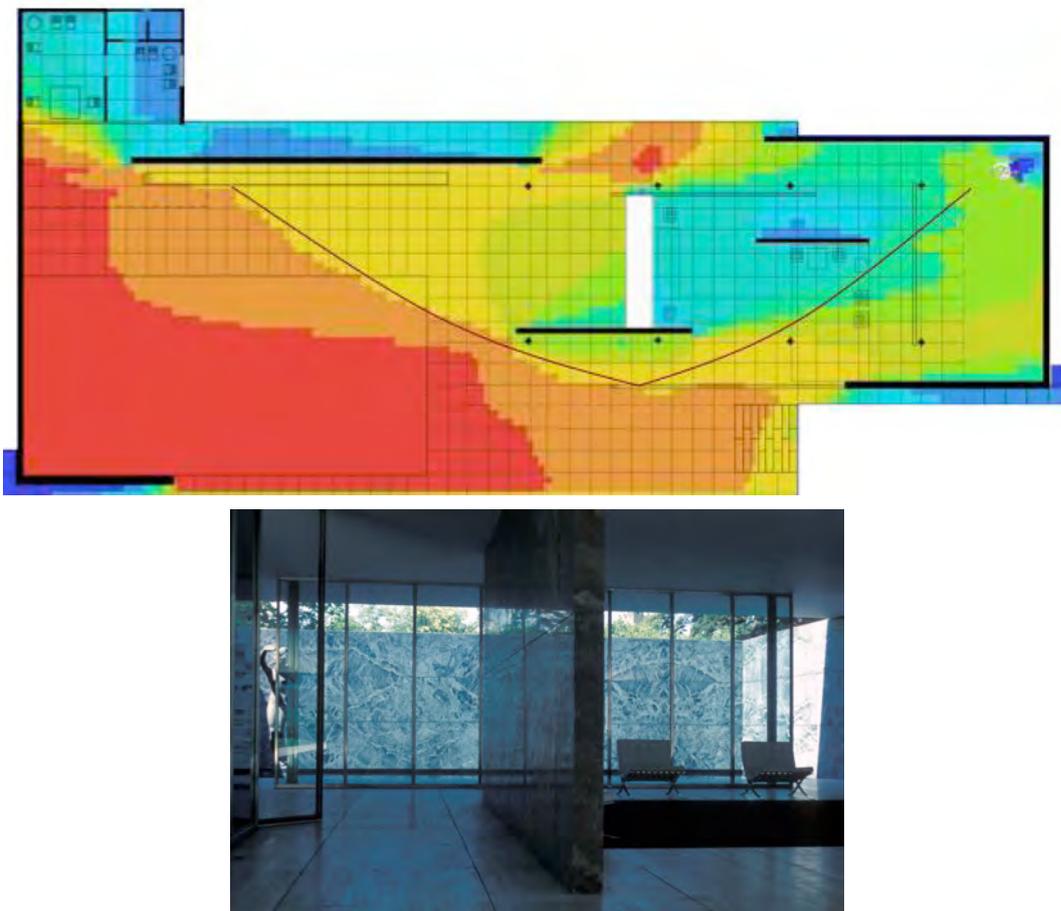


Figure 3. Mies van der Rohe - Barcelona Pavilion. (a) above; (b) below.

These examples show that architects engage with how spatial and formal relations interact to construct configurational content. The emphasis they invest on both types of properties intensifies or juxtaposes them, so that none escapes the attention of the viewer that wants to understand how relations are conceived and how these buildings are understood by moving inside them. In these examples we see formal and spatial intelligibility at work organizing architecture as conceptual ordering and as perceptual experience. To suggest that architects exercise abstract thought on the prop-

erties of space alone, would be only part of what they do as they engage with both spatial and formal configuration. Architecture is not spatial or intellectual practice, but an exploration of what our eyes see in space-time and what our minds grasp through spatial and formal relations.

2. The ghost of 'conceived space'

The strength of space syntax in the study of these buildings is in illustrating, elegantly and rigorously, an old idea that critics have observed, but did not measure or represent lacking the tools and the understanding of space as a structure of movement. Architects and historians have dealt with form as a result of a tradition devoted to the study of geometry, but also because formal principles can be discerned at once through a diagram, a drawing, or panoramic vision. Space instead, is asynchronous and can be understood only sequentially through time. By analyzing space, space syntax operates in an area architects and theorists are not versed lacking the notion of spatial configuration.

22

Yet, it is a well-known fact in space syntax research that spatial attributes are not free from formal relations. As these examples show, integration is influenced by varying degrees of geometric control on the patterns of visual information. Spatial configuration is dependent on the relative placement of physical elements. But in spite of coordinating axial lines, convex spaces, isovists and their interconnections, form in space syntax is buried under the notion of depth and changes of direction. Metric and topo-geometric properties have been incorporated in the syntactic analysis of urban spatial networks (Hillier, et al., 2007). However, in architecture these properties are handled consciously, rather than being unconsciously retrieved and re-embedded in space.

For Hillier, architecture attempts to render the non-discursive properties of configuration discursive and make them accessible to reason (1996). Spatial configuration in this way is raised from the level of unconscious to the level of conscious knowledge, turning from ideas we *think with* to ideas we *think of*. However, since syntactic analysis focuses on the non-discursive patterns alone, with regards to architecture, the conscious configurability of space and form remains a 'ghost' buried under the unconscious patterns of space.

Space syntax addresses how we develop our knowledge of buildings and cities away from traditional notions of geometrical order that are unable to describe architecture as a social reality. Yet, in spite of the emphasis on rules we learn unconsciously by living and moving in space, the hallmark of architectural humanism rooted on the relationship between intelligibility and form haunts the configurational theory of architecture. Investing on how buildings and cities are understood as parts coming together to construct wholes, space syntax is not so far away from a theoretical tradition of how mind and body interact through abstract relations. In the absence of a theory and a method that relates geometrical to spatial properties, space syntax has buried the physical attributes and the intelligibility of form into the notion it is analytically strong, that is, embodied space, as the only feature of architecture and configuration

Space syntax - history and theory

The notion of configuration refers to architecture as a morphological entity. It does not include other ways in which architecture is conceived by architects or the theoretical ideas they use in design. For example, to be a classicist meant to subordinate experience into the realm of universal values of symmetry and harmonic proportions. It was about soliciting the belief that 'all things in the fullness and variety are subsumed, organized and animated by abstract relations planting evidence that what we recognize as real derives from invisible relations' (Evans, 1997, p. 251). This is evident in the way in which geometry in a classical building controls integration through the axial recession of rooms and from few spatial positions.

Similarly, the systematic attempt by modern architects to break the classical code of correspondence between space and form was the result of a theoretical position. In its pursuit of utopian plans for the future, the architecture of the early modernists was to lie outside the stylistic formalisms of the past, the clothing of authority and institutional structures. But at the same time their interest in 'objectivity' kept them anchored to the compositional abstractions of history, the harmonious relations among parts and mathematical grids, devices for mapping the real while also maintaining a link with the universal (Krauss, 1985). Rowe explains that this kind of objectivity had limits. It meant an architecture, which could not call itself 'new' as such abstract relations were at the bottom classical (1984). So, these conflicting conceptions were given an alternative twist. Formal properties were hidden behind the visible surface of buildings so that, in Mies' terms, the 'will of the epoch' could be transplanted from form into space.

Since Venturi's *Complexity and Contradiction in Architecture* architects and theorists have been preoccupied with dismantling the avant-garde through an immense investment on formal conflicts. Tschumi's *Park de la Villette* for example, was conceived as three separate geometric systems expressing his idea of 'post-humanist' architecture (1999). In Eisenman's *Wexner Centre* the multiple fragmentary grids operate distinctly from structure or spatial enclosure (Vidler, 1992). Deliberately posed against the structural or corporeal function of the grid, they break the link of architecture with history and of formal with spatial intelligibility.

These observations show that the evolution of the relationship of form to space in buildings is parallel to a development of conceived ideas about geometry and its mode of signification. Geometry in classicism was seen as the precondition of intelligibility and cosmic order. In modernism it became an expression of objectivity, while in the so-called post-humanism an expression of fragmentation applied on previous thought systems. Geometry and form are conceptual and representational systems used to construct spatial relations through drawings, models and various kinds of visualization. But they have been also media to explore the connection of architecture to other areas of knowledge such as nature, society, science, philosophy and mathematics. Evans attributes the power of shapes to link ideas across fields to their capacity to travel between 'the visible and the invisible, the

corporeal and the incorporeal, the absolute and the contingent, the ideal and the real'. In design they convey geometry from one state to another, and as such they are 'changeless in themselves and volatile in relation to everything else' (1995).

So, architecture operates not only in the realm of space and form, but also in a world of theoretical ideas linking configuration with systems of thought through analogical and metaphorical intensification. Knowing how architecture is conceived through theory, as in the classical and modern examples, offers additional levels of understanding to the relationship between formal and syntactic centrality. But while there seems to be a link between these theories and morphological properties, in reality no route exists to derive one from the other. Architects can give different shape to ideas, or justify the same morphological choices by different conceptual skeletons. It is, in fact, the uncertain link between idea and building what makes architecture an instrument of theoretical speculation. But it also makes it potentially dangerous, because theories can refer to an illusory reality (Hillier, 1996), or the illusion that the 'spoken word' coincides with social practice (Lefebvre, 1991). It is precisely the illusionary potential of architectural ideas that strengthens rather than removes the need to understand them. To explain the relation between architecture as conceived entity and as lived reality we need knowledge of the non-discursive patterns of space and form, as well as the discursive patterns of thought used in design.

Without input from history and theory configurational analysis alone cannot raise architectural discourse into the level of conscious knowledge. Similarly, without knowledge of non-discursive rules, history and theory are confined within the limits of the discursive, an architecture consisting of sets of concepts, contextual influences, and their historical development. Space syntax gives history and theory the conception and analysis of spatial configuration linking architecture to society and the lived aspects of space. What history and theory offer to space syntax is the study of architecture in the realm of conceived ideas that are formed in design.

3. Architecture and its two kinds of knowledge

We can suggest that architecture uses two kinds of knowledge. The first kind is configurational, as defined by Hillier, which is knowledge raised into the level of conscious thought exercised in the non-discursive aspects of space (1996), with the added caveat that we need to include formal characteristics into the notion of configuration. The second kind is *theoretical knowledge* that architects and scholars learn and use consciously through the practice and study of architecture. The importance of configurational knowledge is evidenced by extensive research. But in order to realize the full potential of space syntax to cast light on architectural space in a way in which other theories do not, we need to understand why the second type of knowledge is essential in architecture.

Configurational knowledge can help architects to accomplish the social purposes of their designs. However, designers are not simply concerned with buildings as social realities, but also with how to produce new and better ways we live in buildings and cities. Architecture is substantiated by

theoretical knowledge because its primary intention is social change. If this were not its nature, it would not be a creative discipline, but a set of rules, such as those found in pattern books or the normative patterns of the vernacular. If social change were not the driving force in architecture, throughout the history of cities and buildings architects would not have attempted to dream of better worlds, and design so many utopias. The case that many of these attempts have failed does not undermine the architectural desire for innovation. The question is not how to renounce architecture for its naïve impulse for utopia, or simply how to enable it to meet criteria for social performance. It is rather how to empower it with theoretical and analytical knowledge so as to successfully address contemporary problems in society, and its courage to design environments that were not previously possible to imagine.

The notion of innovation underlines Hillier's definition of architecture. He explains that architecture is in the taking into 'abstract comparative' thought of the non-discursive properties of configuration exercised in a realm of possibility and 'aiming at innovation rather than cultural reduplication'. Invariant differences within a pattern of activities point to a normative rule or cultural genotype. Genotypes capture the unconscious rules that are reproduced in the vernacular as the means of the 'transmission of culture by artifacts'. Architecture exists 'to the extent that there is genotypical invention in the non-discursive, that is invention with the rules that govern the variability that is possible within a style' (1996, p. 34).

Yet architecture as a theoretical activity is a modern phenomenon. It emerges in the Renaissance period, after which its essence is no longer with the unbroken traditions of the guilds, but with knowledge lying with the architect. This does not mean that we do not recognize architecture in pre-modern buildings. Architects and vernacular builders can innovate without conscious engagement with theory and innovation. But the fact that the definition of architecture varies with historical context implies that even if we focus on modern space, we cannot judge that a building is architecture outside historical considerations. The supra-historical intent we see in certain works does not release them from a historical and cultural context. Neither does it release our judgment that a work is architecture from historical understanding. But more importantly, if architecture aims at innovation, innovation is conditioned by historical reality and the historicity of knowledge. What is possible to be conceived and produced largely depends on knowledge and possibilities that are available at a time.

It is not argued that architecture has a cause and effect relationship with history and context. However, if architects innovate, it is not because they exercise unlimited speculation, but because they operate within certain restrictions. 'Abstract comparative knowledge' founded solely on configuration excludes the factor of the changing context of time as limiting or opening up possibilities for innovation. It is the understanding of historical reality as it impacts on possibility that opens the way to possibilities that do not yet exist. A characteristic example to illustrate this argument is the onyx wall in the Barcelona Pavilion. The accidental discovery of the onyx block by Mies and the demands for the economic use of this costly material brought about changes to the dimensions of the building.

These dimensions were adjusted so as to dematerialize the wall through reflections serving a configurational intention. It is not the spatio-temporal events that determine the course and meaning of architecture. It is the way in which architecture engages with constraints imposed by such events that provide evidence of innovation. Architecture is not simply in the comparative understanding of possibility, but also in the ways in which it responds to constraints imposed on possibility.

Architecture and innovation

Expanding this discussion into the larger context of history can identify its role in recognizing innovation. Architects are not concerned with historical realities in order to replicate knowledge, but with how configurational possibility can give reality new shape and meaning. But in order to deviate from normative rules they need historical understanding. This does not imply history in the narrow sense of the sequence of building forms, or that designers cannot innovate without knowledge of history. Architects' engagement with the past is different from that of historians, although it is influenced by the interpretations provided by historical studies. History provides architects with a range of forms and factors that have enabled or restricted possibilities. It enables to identify when innovations occur in time and reveal the parameters that restrict or release them. 'Abstract comparative thought' cannot operate outside the context of time. Likewise, the configurational analysis cannot discern when architecture occurs without historical understanding.

History is not confined to the study of artifacts and their social and cultural context. It also encompasses the theoretical examination of artifacts and their thought systems. This leads to the question of why architecture needs theory. For Hillier, architects use theories because they do not seek to reproduce a cultural genotype but to innovate. Architecture is characterized by 'genotypical invention' marking the passage from the 'culture bound to the universal'. The precondition for this invention is theoretical knowledge of possibility that is not contained in contemporary cultural knowing. Another reason for which architects employ theoretical ideas is because they need to structure their search in a 'solution space that might otherwise be both vast and unstructured'. Theoretical ideas refer to some prior conceptions of the world, and how they will respond to architects' manipulations. These conceptions are 'analytic-normative complexes', relying on some analytic content that can be tested against the capacity to sustain their generality (Hillier, 1996).

However, exercising abstract comparative knowledge of possibility and structuring knowledge based on an analytic-normative model are contradictory operations. This is because the structuring of exploration limits the range of configurational possibilities to only those that can fit a particular conception. For example the conception of the world as a continuum in which all categories merge together in de Stijl means that out of all possible configurations only those that merge the various spaces with each other are appropriate. At the core of all creative acts is a fundamental conflict: on the one hand, to maximize the exploration potential in a field of possibility, and on the other, to use a

conceptual framework that limits the variants and justifies the order of choices. In the innovative activity none of these two kinds of thought are to be found in existing cultural or conceptual knowledge. Architects therefore need to exercise comparative thought not only in the area of configurational possibility, but also in the field of possible conceptual models. It is only by exploring choices in both fields that the combinations of configurational variants can give rise to a conception of the world, and this conception can guide these combinations. Otherwise, adopting a theoretical framework as a preconceived principle reduces the range of variants at an early stage in the design process limiting the potential for innovation.

Comparative thought at the level of theoretical knowledge occurs in a field of ideas that are implicitly or explicitly influenced by historical and theoretical narratives, such as the conception of architecture as nature (humanism), social engineering (functionalism), language (post-modernism), and their indefinite number of permutations. We need therefore to define architecture in the conscious exploration of possibility in discursive and non-discursive areas of knowledge aiming at both configurational and conceptual innovation. Architecture and the judgment we make about it pass not only through spatial configuration, but also through the ways in which architecture conceptualizes, and has historically conceptualized, the world through theoretical knowledge.

Space syntax and architecture

Architects might claim that they do not use theory in design, but an intersection of the two permeates what they do in the need to experiment with a conception that will work when translated to a building (Hillier, 1996). In any case, configurational and theoretical knowledge can provide awareness of how certain conceptions can be illusionary representations of the world while also limiting possibilities for innovation. But the importance of the two kinds of knowledge is not only in defining architecture. It is also because theoretical ideas have the capacity to infiltrate life becoming social knowledge with time. The notions of territoriality and privacy for example are not only conceptions adopted by architects and imposed on culture. They have become ideas individuals and social groups think with reproduced through housing projects and gated communities at the distributed levels of society. Or as Foucault observes, the imposition of disciplinary control on culture originating in the 19th century has been transferred to the level of individual minds through the idea of 'normalizing judgment' (1977). Non-discursive and discursive knowledge therefore do not reside in separate worlds but intertwine. Architects step outside the normative rules of society to initiate innovation. But they also produce conceptual structures that are imposed on society, which if upheld for long through repetition turn to cultural genotypes.

A similar idea underlines Lefebvre's suggestion that 'conceived space' plays a part in 'perceived space' (spatial practice), which varies according to society, mode of spatial production and time. At certain periods the two kinds of space coincide as in the Renaissance towns, while at others, the dominant mode is based on conceptualizations produced by experts (1991). So, space does not only interface individuals and social groups, but also configurational with discursive knowledge.

Architects interact with other professionals and academia, while also being members of spatial practice. Individuals formulate links between situated practices through 'multiple overlapping memberships' (Hillier, 2001). But at the same time they form networks of discursive knowledge moving between these memberships. Although the two types of knowledge can be discretely defined, in the real world they are not distinct, but intertwine. It is not possible to disconnect configuration from theories used in design, or architecture from the city, and study them separately without splitting architecture into conscious and unconscious configurationality, theory and spatial practice. The abstractions used to conceptualize architecture, act upon the world of the concrete, and the traffic between conceptions of space and social life are essential factors for defining architecture as innovative activity and as analytic and theoretical study.

So, what kind of work should space syntax do for architecture? Space syntax helps architects to meet social ends and grasp the difference between theories and life in buildings and cities. But in order to help architecture to meet means, it needs to interface analytic knowledge of configuration with theoretical knowledge used in design within the changing context of time. The importance of defining architecture and the city as networks intersecting discursive and non-discursive knowledge through time is crucial in enabling architects to affect social change. Architects and scholars of architecture do not take the strategic decisions that underline the production of the built environment. They respond to a client's need for a program, or provide critical evaluations. However, they can influence the client's conception of a program and transform the factors that shape spatial and social experience. Space syntax should continue advancing analytic knowledge of configuration to ensure that the social transformations architects attempt have a positive effect. But it should also understand both dimensions of knowledge within which architecture operates in its pursuit of innovation and change.

References

- Evans, R. (1995), *The Projective Cast - Architecture and its Three Geometries*, MIT Press, Cambridge (MA).
- Frankl, P. (1968), *Principles of Architectural History*, MIT Press, Cambridge (MA).
- Foucault, M. (1977), *Discipline and Punish*, Vintage, New York.
- Hillier, B., Turner, A., Yang, T., and Park, H. (2007), "Metric and Topo-geometric Properties of Urban Street Networks: Some Convergencies, Divergencies and New Results," in A.S. Kubat, Ö. Ertekin, Y.I. Güney, and E. Eyübo_lou, eds., *Proceedings, 6th International Space Syntax symposium, Istanbul, Vol. I*, pp. 001-1 - 21, ITU Faculty of Architecture, Istanbul.
- Hillier, B. (2005), "The Art of Place and the Science of Space," *World Architecture*, Vol. 11 No 185, pp. 96-102.
- Hillier, B. and Netto, V. (2001), "Society through the Prism of Space - Outline of a theory of society and space," in J. Peponis, J. Wineman, and S. Bafna, eds., *Proceedings, 3rd International Space Syntax Symposium*, pp. 13-1 - 13-27, A. Alfred Taubman College of Architecture and Urban Planning, Michigan.
- Hillier, B. (1996), *Space is the Machine*, Cambridge University Press, Cambridge (MA).
- Krauss, R. (1986), "Grids," in *The Originality of the Avant-Garde and Other Modernist Myths*, MIT Press, Cambridge (MA).
- Lefebvre, H. (1991), *The Production of Space*, trans. D. Nicholson-Smith, Blackwell, Oxford.
- Peponis, J. and Bellal, T. (2005), "In Falling Water," in A. van Nes, ed., *Proceedings to the 5th International Space Syntax Symposium, Vol. I*, pp.65-81, Techne Press, Delft.
- Peponis, J. Wineman, J., Rashid, J., Hong, K., and Bafna S. (1997), "On the Description of Shape and Spatial Configuration Inside Buildings: convex partitions and their local properties," *Environment and Planning B: Planning and Design*, Vol. 24 No 5, pp. 761-81.
- Psarra, S. (2009), *Architecture and Narrative - the formation of space and cultural meaning*, Routledge, London.

- Psarra, S. (2003), "Top-down and Bottom-up Characterizations of Shape and Space," in J. Hanson, ed., Proceedings to the 4th International Space Syntax Symposium, Vol. I, pp.31.1-18, Space Syntax Laboratory, London.
- Psarra, S. and Grajewski, T. (2001), "Describing Shape and Shape Complexity Using Local Properties," in J. Peponis, J. Wineman, and S. Bafna, eds., Proceedings, 3rd International Space Syntax Symposium, 28.1-16, A. Alfred Taubman College of Architecture and Urban Planning, Michigan.
- Psarra, S. (1997), "Space and Form in the Architecture of Le Corbusier and Mario Botta," in M.D. Major, ed., Space Syntax: First International Symposium, pp.32.1-29, Space Syntax Laboratory, London.
- Rowe, C. (1984), *The Mathematics of the Ideal Villa and Other Essays*, MIT Press, Cambridge (MA).
- Turner, A. (2006), *Depthmap v6* (Computer Program), UCL.
- Tschumi, B. (1999), *Architecture and Disjunction*, MIT Press, Cambridge (MA).
- Vidler, A. (1992), *The Architectural Uncanny*, MIT Press, Cambridge (MA).
- Wittkower, R. (1971), *Architectural Principles in the Age of Humanism*, A. Tiranti, London.
- Wölfflin, H. (1966), *Renaissance and Baroque*, Cornell University Press, Ithaca (NY).

Contact Details:

Dr. Sophia Psarra sparra@umich.edu

Associate Professor of Architecture,
A Alfred Taubman College of Architecture and Urban Planning
University of Michigan
2000 Bonisteel Boulevard
Ann Arbor, MI 48109-2069
USA