

Depth Configurations. Proximity, Permeability and Territorial Boundaries in Urban Projects.

ABSTRACT.

*“Territorial depth is measured by the number of boundary crossings needed to move from the outer space to the innermost territory”
(N.J. Habraken, “The Structure of the Ordinary” MIT Press Cambridge 1998)*

Depth configurations and access control are the main parameters of academic research, which investigation domain is defined by an intermediate and alternating scale, starting from the domestic scale to the scale of the neighbourhood, till the dimension and complexity of urban development areas. This paper pronounces a theoretical and conceptual discourse about the organization and depth of collective spaces, tested by re-reading historical and contemporary projects. Theories and models of proximity, permeability and territorial boundaries are linked with the concept of depth configurations, together with their spatial, social, cultural and environmental conditions. Depth configurations that determine linear and multiple movements between public and private realms, between spaces with individual or collective use, are studied and compared to define possible guidelines for reading and designing urban space. Collective space and its related systems of relative distances are considered the file rouge of investigation.

*The academic research of this doctoral thesis was conducted using a particular model of investigation, related to the very nature of architecture and urban design. Here, a theoretical and conceptual framework is defined that is tested and illustrated simultaneously by a series of case studies of historical and contemporary projects. The doctoral thesis can be seen as “a thesis on theory, not a theoretical thesis”.
(Manuel de Solà-Morales, January 2010)*

KEYWORDS.

collective space, depth configuration, proximity, permeability, territorial limits, urban projects

Kris W. B. Scheerlinck

WENK Sint Lucas Architecture School Brussels / Gent (Belgium)

Paleizenstraat 65 1030 Schaarbeek

kris.scheerlinck@mac.com

N° Tel. +32 2 242 00 00

Bio

Kris W. B. Scheerlinck studied Architecture (WENK Sint Lucas Ghent) and Urban Design (UPC Barcelona) and obtained his doctoral degree in Architecture with Prof. de Solà-Morales and Prof. Ferrer as thesis directors (UPC/URL Barcelona). He runs studios and teaches in international Architecture and Urban Design Programs at various institutions and universities in New York, Barcelona, Gent and Brussels, where he continues academic research on depth configurations in urban projects.

<http://web.me.com/kris.scheerlinck>

<http://streetscapeterritories.wordpress.com>

Depth Configurations. Proximity, Permeability and Territorial Boundaries in Urban Projects.

The academic research of this doctoral thesis was conducted using a particular model of investigation, related to the very nature of the architectural and urban design project. Here, existing theories were sampled to construct a new theoretical and conceptual framework about urban space that was tested and illustrated simultaneously by a series of case studies of historical and contemporary projects. The thesis describes and analyses theories as well as built projects and uses them to illustrate a new way to approach and design urban projects on different scales. In this ongoing research project, the outcome is not a result of systematic analysis of site-specific cases but rather uses these to illustrate the relevance of the proposed conceptual framework. The dissertation can be seen as “a thesis on theory, not a theoretical thesis”ⁱ.

Depth

According to N.J. Habraken, the built environment is defined by territorial organization and is founded on the principle of inclusion within other territories. The author presents a diagram to relate this very principle of inclusion to transitions between private and public spaces. Imagining different ways to access those theoretical territories, N.J. Habraken defines the concept of territorial depth.

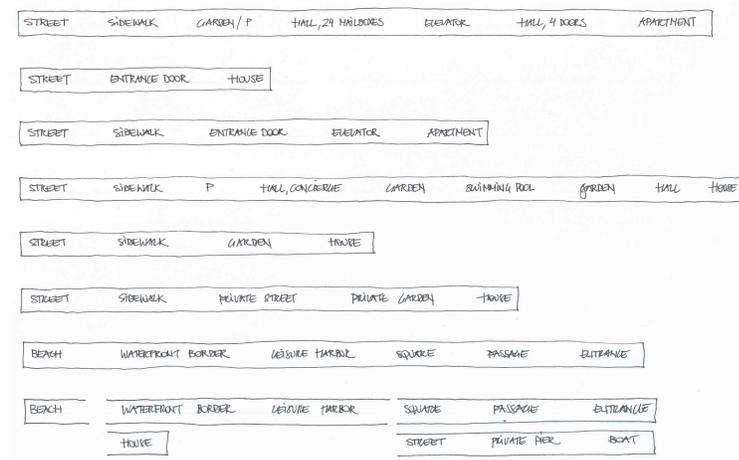


Figure 1: Depth sequences

“Territorial depth is measured by the number of boundary crossings (...) needed to move from the outer space to the innermost territory”ⁱⁱⁱ
 However, territorial depth is not a static parameter: within a certain time framework, after the intervention of various urban agents, depth can increase or decrease, according to the specific characteristics and dynamics of the built environment.

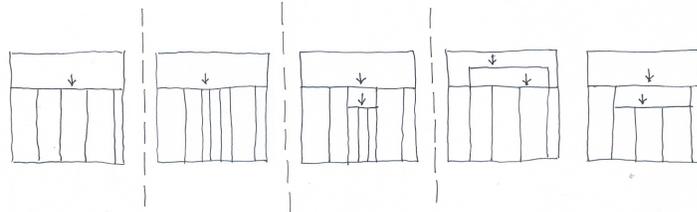


Figure 2: Increase in Territorial Depth. (diagram made after fig. 12.8: N.J. Habraken, “The Structure of the Ordinary” MIT Press Cambridge 1998, p215)

N.J. Habraken relates the possible increase in territorial depth to changing density. The diagrams describe different scenarios of increasing depth: the first one represents a system of simple included territories. Starting from this basic territorial division, different scenarios are explained.

Increasing density sometimes leads to nothing more than an intensification of available private space (second scheme to the left): territorial depth is not increased, unlike the process of densification. However, in some cases, densification does generate an increase in territorial depth (third scheme to the left). Besides intensification of use, meaning subdivision of territory, a zone of shared or collective space was created before entering the new individual territories. Here, territorial depth increases as you cross more boundaries when you “move from outer space to innermost territories”.

In the following scheme (second to the right) we see how included territories occupy public space to make it their own, while the last diagram explains how included territories sometimes sacrifice some of their own space to create shared space. These two scenarios do not contemplate densification of the urban system to increase depth.

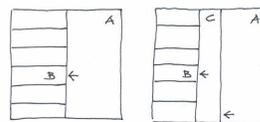


Figure 3: An example of increased territorial depth in Valparaiso, Chile. (diagrams made after photographs in situ, Valparaiso, Chile, 2002)

In other words, increasing depth is directly related to the creation of collective or shared spaces at different levels within the territorial hierarchy. Shared spaces can be common courtyards or vestibules, gardens, storage or parking spaces, common playgrounds, corridors or passages.

Territorial depth is strongly related to the property structure within the hierarchy, even not exclusively dependent on it.

The idea of increased territorial depth is visible and readable in many urban projects, at a small scale as well as at a bigger scale, within different cultural contexts. In some cases, projects are designed or laid out in an intentioned way to increase or decrease depth, while in some other cases depth is a consequence of external factors like pre-existing site conditions. A case where topography or the absence of rational planning regulations caused an increase of territorial depth, is in some neighborhoods in the city of Valparaiso, Chile, as shown in the image and diagrams above. The attached houses in this particular street were built before mobility needs obliged to cut through the neighborhoods and trace wider streets. Obviously, the position of each house is in a specific relation to topography. To have access to one of the houses situated in the middle, one has to walk up a flight of stairs and pass by the neighbor's windows and front doors to enter the house. We could say that the proportion of shared space within this sequence is getting higher by this configuration. The chance you meet a neighbor or a visitor on a smaller distance is relatively higher than when the houses would have been built on a flat surface, creating in that case a more direct relationship between private and public zones. This particular model of accessibility can be found in many streets in the city of Valparaiso: because of topographical conditions, shared space is a structural element within the urban fabric. It is important to mention that in this case no gates or fences appear to increase depth: they can be considered invisible territorial boundaries.

However, besides increasing depth, N.J. Habraken mentions bottom-up actions as a cause of a decreasing territorial depth, that is when lower level agents invade shared public space and re-appropriate that space in its entirety to enlarge their own territory (see second diagram in figure). As a result, access loses depth as the in-between space gets lost in this action. Nevertheless, this practice is not very common in urban settlements.

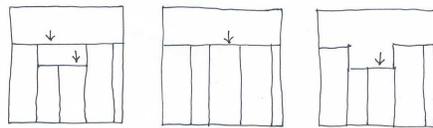


Figure 4: Decrease in Territorial Depth, principle schematic diagrams. (diagram made after fig. 12.10: N.J. Habraken, "The Structure of the Ordinary" MIT Press Cambridge 1998, p219)

The mentioned top-down equivalent, however, is applied more often with a decrease of depth as a result: "a greater territorial power appropriates public

space common to territories on the level now removedⁱⁱⁱ

This means that encompassing territory invades or annexes included territory, as can be seen in the third scheme. The author refers to the case of Tunis where gates in dead-end streets were systematically demolished or to the case of El Cairo where the French occupants, under Napoleon, took down the gates of all dead-end streets to control occupied territory more easily.

Depth configurations

We could conclude that, according to N.J. Habraken's hierarchical approach, depth is related to models of space organization in ever-changing aggregated, included or overlapped territories: defining and controlling access provides territorial control. Territorial mechanisms are based on creating asymmetrical relationships: territorial control tends to establish vertical relationships that avoid equal or indifferent accessibility between different space users at all scales. Urban space with restricted or conditioned accessibility tends to be more stable than territories with no more than a potential access control. Within this territorial matrix, the desire for privacy and the need for security are protagonists. In other words, depth is the result of physical, visual and territorial spatial configurations.

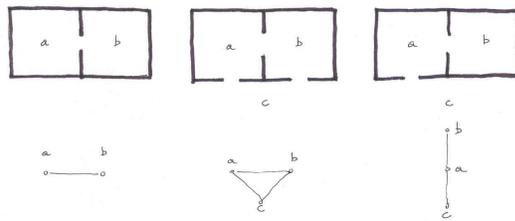


Figure 5: Depth configurations: the example of balanced, circular and linear depth as a result of configuration (diagram by B. Hillier, "Space is the Machine", Cambridge University Press, Cambridge, 1996, p 34)

However, Bill Hillier^{iv} presents a non-hierarchical understanding of space that allows the adoption of depth as a relative parameter and reads the built environment as a non-spatial system of (non)distributed elements. Here, no pre-orchestrated values are attached to the elements belonging to the depth configuration: space syntax theory is not based on rank and order. Hierarchical structures establish predefined values and inherent specific values to parts of the built environment: access through a main gate of an alley is more important than a secondary entrance at the level of the individual property. Shared monumental staircases in a residential building obtains more structural qualities than the individual alternative. Here, multiple orientation exists, but its constituting elements are not understood as equal: there is a rather vertical organization of space. In a non-

hierarchical model, the idea of a configuration as a set of spatial and social relationships between different elements becomes more important than hierarchy and its derived vertical strategies to control space. Flexible reading of the environment and its territorial meaning might indeed correspond to a rather horizontally oriented process, where inhabitants have equal multiple options of how to use space.

Nevertheless, hierarchical as well as non-hierarchical reading of space and depth both suggest the existence of configurational systems, with several determining urban parameters and simultaneously operating agents. Both theories coincide in the importance of depth and the permeability within spatial configurations.

Related to the idea of space as a configuration of access, a coherent framework should be defined: access defines permeability in private and public properties. We should focus though on the way we use space, to read and understand the qualities of depth configurations.

Collective space

Often, collective space is understood as a space, sandwiched between public and private spaces. Many urban projects deal with collective space as if it were a strict synonym for in-between space, for transition or overlap, for interstitial space, always containing a soft and gradual spatial effect. However, in order to study depth sequences as part of physical, visual and territorial configurations, we need to redefine the concept of collective space in a more precise way: contemporary urban phenomena invite profound rephrasing of the theory about private and public space. Traditional bipolar private-private distinctions might not explain contemporary ways of territorial functioning.

Manuel de Solà-Morales^y mentioned that in many Western cities, since the end of the 19th century, public space was systematically reinforced in urban projects: urban extension plans or big scale parks responded to coherent design mechanisms that saw public space as something more important than private space. However, during the 20th century, design tactics, as well as the nature of the environments' operating agents, have changed drastically. The dominance of car traffic, the appearance of production models based on consume and less on production, the increased use of telecommunication technologies, the speed of change and intervention and, above all, the change of scale of the latest urban projects have changed the way we design, build and experience our environment.

As a result of recent processes of spatial specialization and socio-functional segregation, together with increasing thematization and extreme systematization of the built environment, traditional dual mechanism of public versus private loses strength. New models of space use and production arise.

Manuel de Solà-Morales questioned two aspects of the traditional definition of public space: that it should be publicly owned to have a collective

dimension, and that it should be freely accessible by everyone. The author argues: "It is a fact that the city is the very place where the private domain can be, and often is, a social domain- just as much as or indeed even more than the public domain.(...) Private buildings as public elements, radiating social meaning and value that extend beyond the actual buildings embody their urban character"^{vi}

In other words, the very nature of the property, that is who owns the piece of land or the building, becomes less important than the way we use space. de Solà-Morales suggested extending the notion of public space to encompass new spaces such as "parking lots, shopping malls, vacation centers and cinema complexes." He called these collective spaces and argued that architects should seek broader responsibility for their design. They should not concede their design to commercial logic and developer standards, but rather seek to transform them into challenging new fields of architectural investigation. de Solà-Morales described this task as "the urbanization of the collective territory." The author continues: "the civic, architectural, urban and morphological richness of a contemporary city resides in the collective spaces that are not strictly public or private, but both simultaneously. These are public spaces that are used for private activities, or private spaces that allow for collective use, and they include the whole spectrum in between..."^{vii}

The author suggests interconnecting private, enclosed spaces, to upgrade and turn them into parts of collective realm: to include the particular into the sphere of the influence of the public.

This new understanding of the private-public relationship changes as well the character of depth configurations and proximity: this no more depends on a simple public/private distinction but could be related to the amount, quality and nature of collective spaces, the spaces we collectively use. Depth understood as a successive crossing of territorial boundaries from public realm to private one, or vice versa, gets a different meaning if we apply it to the idea of collective spaces. The simple, clear and linear understanding of an urban sequence of approach shifts to a multiple, more ambiguous reading of depth in urban projects.

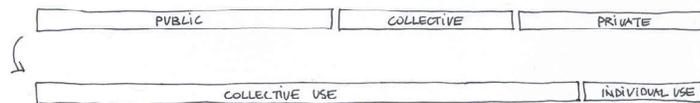


Figure 6: Reframing collective space

This framework of collective spaces provides an interesting tool to disentangle the collective structure of urban projects, on different scales. A new urban theory, based on the combination and actualization of the idea of depth, configuration, collective space and proximity, allows a new reading of urban projects, with focus on the collective strategies within.

Mapping systematically all spaces with a collective use, independent from present property distinctions, interior/exterior conditions or functional

specificity, allows an alternative reading of urban projects.

Coherent mapping: configurations of depth and proximity

A systematic study of various historic and contemporary housing typologies shows an interesting range of depth configurations at a domestic scale. For each selected housing typology, a systematic drawing was made of its containing aggregated, integrated or overlapped territories with a later indication of (higher or lower) levels of collectiveness (yellow color): only the most individually used territories are left blank (white) in the plans and corresponding diagrams. Territorial boundaries are indicated (red lines, indicating a change of accessibility or access restriction, e.g. between a corridor and an individual sleeping room), together with the detected overlap scenarios (olive green color) and sequential gaps (proximity: spacing mechanisms, waiting areas or buffer zones between different spaces, indicated in light green color) Within this series of domestic depth configurations, the more street-related area is indicated (hatch) and to make possible the comparison between the different projects, this area is always seen as the relative starting point of measured depth sequences. This particular methodology allows detecting different outcomes in relation to the amount, location and structure of collective space in the configurations.



Figure 7, 8 and 9: Examples of the study of the collective structure in urban projects at different scales (Alvar Aalto 1958, Berlin; Herzog & Demeuron 2004, Long Island; Barcelona Metropolitan Regio 2008, real estate projects)

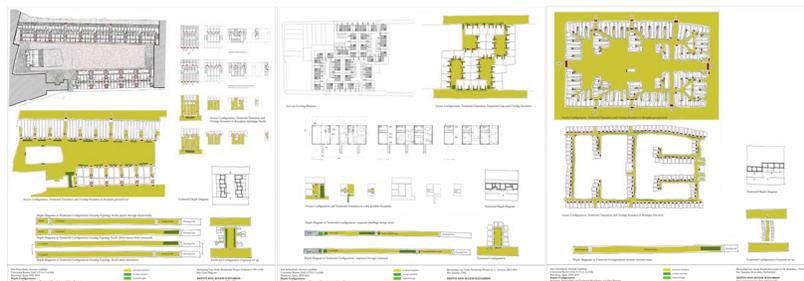


Figure 10, 11 and 12: Examples of the study of the collective structure in urban projects at different scales (W.J. Neutelings 1990, Gent ; A.Aravena 2003, Iquique ; M.Brinkman 1920, Rotterdam).

A similar analysis is done at the scale of the residential project, some with introverted or centripetal organization of space, other with more linear distributed collective spaces. For each project, an analysis was done to disentangle the territorial organization and the position and value of the collective spaces.

The various case studies, from domestic territorial scenarios till the study of urban configurations, show that depth does not only depend on the amount of territorial boundaries crossed, or on the amount of collective spaces within a sequence, but on the way of configuring shared spaces within a project: it is the integration value of the shared space that defines the quality of the depth configuration. Territorial overlap and multiple orientation seem to be important urban design strategies. Increasing the amount of collective spaces does not necessarily increase the value of depth: this depends on the configuration of proximity and permeability of the project at different levels, together with the nature of applied tactics of space codification. Territorial suggestions affect depth differently than explicitly defined sets of boundaries.

A singular project illustrated the previously non-hierarchical territorial approach and allows a multiple reading of a depth configuration. J. P. Storgard, J. Orum-Nielsen, H. Marcussen and A. Orum-Nielsen's winning design for the new residential neighborhood of Galgebakken, Hebsterne (Denmark), 1969-1974, shows a particular interest for using streetscapes as territorial clusters. Collective space is not only distributed through courtyards but through the changing thickness of the new neighborhood's streets. It is D. Mackay^{viii} pointing out the special relation between community and spontaneous activity within the built area. The general set-up of the project is characterized by a relatively compact configuration of low height and all design strategies aim at increased social contact, first among residents and second, with visitors to the area.



Figure 13, 14: J. P. Storgard, J. Orum-Nielsen, H. Marcussen & A. Orum-Nielsen's

residential neighbourhood in Galgebakken, Hebsterderne (Denmark), 1969-1974: access configuration of general set-up, access configuration of urban block

The depth configuration shows at all scales a great variation in possible sequences, linked, overlapped or crossing each other to add complexity to the configuration. We call this a project an example of a configuration based on an open territorial transition with flexible boundaries. Variation within the territorial configuration, based on overlap scenarios, sequential gaps and a simple access configuration helps to add urban complexity to the neighborhoods' system of horizontal interfaces as a collective structure.

However, looking at more recent urban projects, a decreasing level of complexity is detected in many urban projects, with less subtle territorial codification, almost not allowing any user's interpretation. Many urban projects do not present longer or shorter depth configurations but in many occasions obtained a much more simple configuration, compensated by explicitly defined territories. Most recent urban projects show less multiple-choice strategies and are more functionally based. In many projects, the integrated value depends increasingly on corridor elements and pre-planned territorial transitions, avoiding overlap scenarios.

As a last series of analyzed urban projects, some streetscapes in Barcelona and New York were used as case studies for studying various collective strategies, some of them as an informal or even accidental mechanism, others as part of a more formalized and intentioned design. Different tactics of delimiting territories introduced the existence of territorial layers within the different streetscapes, where the visual integration of these depth configurations was studied and compared to evaluate social control and the available flexibility of use.

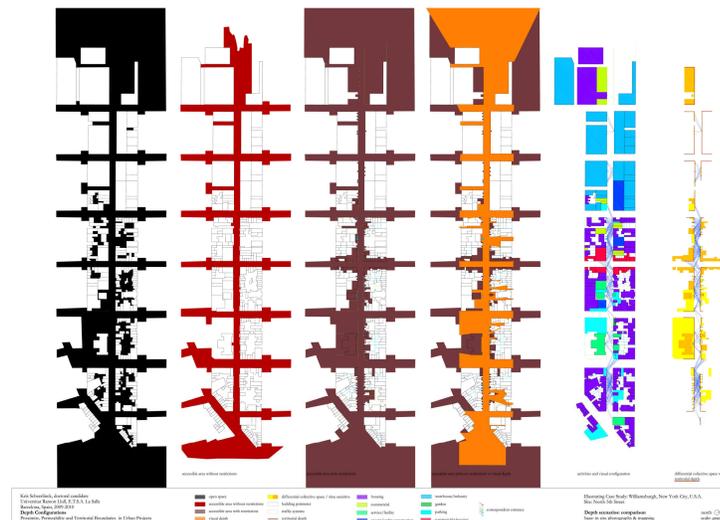


Figure 15: Example of comparative scheme of Open Space, Public Property, Collective Space, Visibility Diagram, Functional Diagram with Visual Integration

and (Differential) Collective Space in North 5th Streetscape, Williamsburgh, New York City (USA)



Figure 16, 17 and 18: Examples of depth mapping and detail of collective space map (included access restrictions, indication of time dependent filter tactics)



Figure 19: Depth Configurations, Differential Collective Space and its Visual Integration in North 5th Street, Williamsburgh, New York City (USA)

Mapping the collective structure of many urban projects at different scales allows a more critical understanding of depth configurations and their socio-cultural conditions: different models of proximity interfere in the lay-out, reading or experience of depth.

Collective strategies

The previous analysis, based on the combination of theories on depth models, configurations and proximity, allows the formulation of a series of guidelines to read or design collective strategies at different scales. The quality of the depth configuration, its level of permeability, the correct

understanding of proximity and its intelligent (de)codification depends on:

- the level of complexity of the configuration, not necessarily on the length of the depth sequences
- the presence of overlap scenarios and its location within the configuration
- the use of territorial overlap as a systematic device within a project
- the presence of sequential gaps within the depth configuration to offer time to decode and interpret territorial limits and allowing certain flexibility of use
- the amount and way of use of open territorial transitions, avoiding pre-defined itineraries
- the selection and position of the collective spaces within the configuration: integration or aggregation. the integration value of the collective spaces within the project
- the use of dual or multiple orientation with the configuration, as opposed to single orientation
- the presence of simultaneous patterns and multiple ways to read and interpret the boundaries
- the independence of scale to define collective strategies
- the dependency of time to develop collective strategies
- the visual integration of depth configurations
- the independence from functional equivalence within the project to define transactional limits

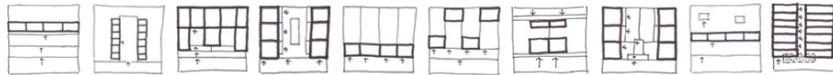


Figure 20: Diagrams of Depth Configurations

Collective spaces are no synonyms for areas forced between clearly private and public spaces: they are time-dependent stretchable horizontal interfaces, often including private or public properties. Collective space is no synonym for intermediate space, it can contain it.

Depth configurations are not based on the traditional private/public distinctions but depend on the amount, the nature and the structural qualities of collective space, together with several spacing mechanisms. The urban project's quality rather depends on the multiplicity of the depth configuration: multiple reading of the space's permeability enriches the urban experience on an individual and a collective level.

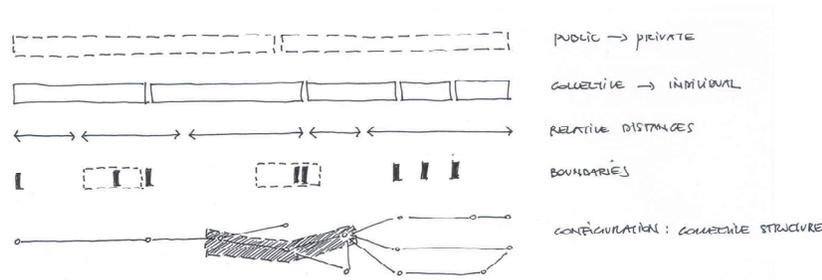


Figure 21: Reading Depth Configurations

The concept of depth configurations does not define a simple morphological discourse about linear quantitative sequences of crossing boundaries: the designing or reading of depth is placed within a more complex configuration of proximity, permeability, integration values and delimiting boundaries on a physical, visual and territorial level. The way and intensity of sharing space is determining for depth value.

The used methodology of research, constructing a coherent conceptual framework, tested by illustrated case studies, allows the formulation of possible guidelines to read, design or evaluate urban projects on different scales and provides a critical attitude towards the used tools in the field of architecture and urban design.

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- i Manuel de Solà-Morales, *défense doctoral thesis*, URL, Barcelona 2010
 - ii N.J. Habraken, "The Structure of the Ordinary" MIT Press Cambridge 1998, p.137
 - iii N.J. Habraken, "The Structure of the Ordinary" MIT Press Cambridge 1998, p.218
 - iv B. Hillier, "Space is the Machine", University Press, Cambridge, 1996, p 33
 - v M. de Solà-Morales, "Public and Collective Space: The Urbanisation of the Private Domain as a New Challenge", in *La Vanguardia*, May 12th, Barcelona 1992, reprinted in "A Matter of Things", Nai Publishers, Rotterdam 2008
 - vi M. de Solà-Morales, "Public and Collective Space: The Urbanization of the Private Domain as a New Challenge," in *Oase*, n° 33, 1992, p3-8
 - vii M. de Solà-Morales, "Public and Collective Space: The Urbanization of the Private Domain as a New Challenge," in *La Vanguardia*, May 12th, Barcelona 1992, reprinted in "A Matter of Things", Nai Publishers, Rotterdam 2008
 - viii D. Mackay, "Viviendas Plurifamiliares: De la Agregación a la Integración", Gustavo Gili, Barcelona 1980, p134-137