The Would, the Could, the Should and the Is: The role of the architect and client in the production of the spatial characteristics of the contemporary Greek-Cypriot House



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Abstract

This is an exposition of the attitude and consequent impact the architect and client have on the design of the spatial characteristics of the contemporary Greek-Cypriot house. According to the interviews, unlike the attitude assumed in designing his own house, the architect tends to critically assess but generally accept the program given by the client. Space syntax analysis of the plans reveals that architect and client houses belong to the same inequality genotype. Still, the former tend to reduce or eliminate the distinction between the formal and the informal sectors of the house while the latter either emphasize it or present an apparent blurring but in actuality keep the two quite distinct.

Keywords

architect-client r e l a t i o n s , contemporary Greek-Cypriot h o u s e , configurational analysis, formal and informal zones

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1. Introduction

It is quite common for Greek-Cypriot couples to commission a professional for the design of their house. The collaboration involves meetings between the two agents, during which the different aspects of the design are discussed and decided on. This work is part of a doctoral thesis (Hadjichristos, 2002) which assesses the role of the architect and client in the overall production of the contemporary Greek-Cypriot house, by examining the spatial configuration, the exterior formal composition and the interior furnishings and decoration. The part of the study presented here focuses on the impact these two agents have on the spatial characteristics of the design.

The basic data, obtained from fieldwork conducted in Cyprus between 1996 and 1997, are the architectural drawings, photographs of the interior and interviews with the homeowners, who are eight architects and sixteen clients (two from each of the architects). The photographs record the actual furniture arrangement in each house, while the interviews provide information on how the specific spatial design was arrived at, how it ended up being used and whether the inhabitants are satisfied with this aspect of their house.

2. The spatial characteristics of the two groups of houses

	Architect houses (mean)	Client houses (mean)
Size (square meters)	249	283
Interior spaces	24.75	27.6
Transition spaces	16	16
Bounded spaces	9.4	10.4
Bounded/interior	0.38	0.38
Transition/interior	0.493	0.401
Total # of rings	7.13	6.13
Interior rings	2.63	1.63
Depth from informal entry (shalldeeper)	I,K,E,L,S=D	K,I=L,E,D,S
Depth from formal entry point	E,L,S,D,I,K	E,S,D,L,I,K
Integration ranking	E,L,S,I,D,K,MB,FE,IE	E,S,D,I,L,K,MB,IE,FE
(segregated-integrated)	BDF for max,min,mean=0.782	BDF for max,min,mean=0.796
visibility	6/8+ve, 2/8-ve	10/16+ve, 6/16-ve
permeability	7/8+ve, 1/8-ve	13/16+ve, 3/16-ve
insulation	1/8 +ve, 7/8-ve	5/16+ve, 11/16-ve
sequencing	1/8+ve, 7/8-ve	4/16+ve, 12/16-ve
categoric differentiation	8/8+ve	16/16+ve
relative position	6/8+ve, 2/8-ve	14/16+ve, 2/16-ve

Figure 1: Results of spatial analysis

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L= living room, S= saloon, E= entry hall, K= kitchen, D= dining room, I= informal dining room, MB= master bedroom, FE and IE= formal and informal entry points to the site, BDF= Base Difference Factor

A quantitative analysis which examines the types of spaces, the ringiness of the design, the depth of spaces from the formal and informal entry points to the site, and the integration pattern of the spatial configuration (Hillier &Hanson, 1984), is complemented by an examination of qualities such as visibility, permeability, insulation, categoric differentiation and the relative position of functions (Hanson, 1998). Rather than using convex break-up, the interior is here broken up according to the furniture arrangement observed in each house. Thus a convex space containing two functions is broken up accordingly. The opposite is not observed regarding proper function spaces but it does happen with transition spaces; one function as it were is broken up into the convex spaces it is made of. The analysis reveals that, irrespective of the role each of the agents played in its formation and despite some slight differences, the two groups of houses belong to the same syntactic inequality genotype (Figure 1).

Cypriot houses differ from dwellings in many other parts of the world in that they accommodate several duplicated everyday living functions that relate on the one hand to the way the family lives at home and on the other to the way guests are received and entertained. In fact, a tradition has grown up of having, for example, an everyday kitchen that is used for ordinary meals that will inevitably appear messy and untidy from time to time, and also a kitchen that is kept clean and pristine at all times so that it is always ready for the reception of unexpected guests. This duplication of reception spaces permits the social norms of hospitality and decency to be observed at all times whilst also allowing the family to relax at home when they are not receiving guests. These duplicated spaces can therefore be termed formal and informal, respectively. The paper focuses on the way the formal is spatially differentiated from the informal since this, more than any other aspect, tends to differentiate the houses designed by the architects in the sample for their own families, from the houses they have designed for clients. The formal and informal functions referred to here are those which are usually found in the contemporary Greek-Cypriot house; the formal sitting room or saloon (S), the formal Dining room (D) and the Entry Hall (E) are the formal functions, while the living room (L), the family dining room (I) and the kitchen (K) are the informal ones.

Architect houses have slightly fewer bounded spaces, slightly more transition spaces and slightly more rings than client houses. As expected, the formal functions tend to be closer to the formal entry point while the informal spaces tend to be closer to the informal entry point, except in the case of the living room in the architect houses which tends to be closer to the formal rather than the informal entry. The integration rankings reveal that in both groups the informal functions tend to be more segregated than the formal ones, apart from the living room which, excluding the entry hall, is the most integrated function in the architect houses, beginning to suggest that architects tend to relax the distinction between formal and informal functions. The entry point is always the most integrated, while at the other end, the kitchen, master bedroom, and the two entry points to the site are the most segregated. This points to the presence of an inequality genotype (Hillier & Hanson, 1984). Still, the BDF for different combinations of the functions in the middle of the ranking (L,S,I,D) all approach 1.0, revealing that these functions are syntactically not strongly differentiated, exhibiting qualities of transpatial solidarity (Hillier & Hanson, 1984). That practically all the houses have a transition space as the most integrated space, reveals that the contemporary Cypriot house is not of the salle commune but of the transition type. Thus, rather than "creating spatial differences between functions, strong interior integration with everyday living in the centre, and a permissive rather than controlling relation to the outside world", it "more uniformly" segregates "interior functions through a central transition space which controls both interior relations and relations with the outside", representing a "conceptual model, in which individual function spaces are assigned a spatial identity more through separation and control than through the organization of complex interrelations" (Hillier et al, 1987: 384).

The qualitative analysis suggests that architect houses tend to allow more visibility and permeability and have less insulation between formal and informal spaces. Visibility here is taken to refer to the degree to which the informal spaces are visible from the formal spaces of the house. The analysis of the plans shows that in the majority of houses, the living room may be visible from the formal spaces while in most cases the kitchen and informal dining room are hidden. Another

aspect which gives a quite different identity to the majority of architect houses is the double height space which usually accommodates a proper function. Most client houses connect the levels visually only through the staircase. Permeability refers to the ability to move from the formal spaces to the informal ones. It is judged as positive if there are no closed doors hindering such movement, while the presence of openings which are only connecting the spaces visually, or doors which are supposed to remain mainly shut, is seen as negative. Insulation refers to the type of boundary between the formal and informal spaces. A plus value is given to a house where walls or other solid partitions are found between the formal and the informal spaces, while a negative value is given where the boundary is implied by softer architectural means such as the arrangement of movable furniture.

Sequencing refers to whether spaces are found in a ring or can be reached only through a transition space. Most of the houses in the architect group have a negative value for both sequencing as well as insulation, showing that most architect owned houses have open plans, using transition spaces as spines of circulation between the formal and the informal areas. This is not exactly the case with the client group which has about half the houses with both values negative. Categoric differentiation is a plus when specific functions are assigned to specific spaces and a minus when functions can be accommodated in a number of different spaces in the design. Practically all houses of both groups have a plus value regarding the categoric differentiation of functions. Relative position here refers to the relationship between the formal or informal spaces, and the back and front of the house. The overwhelming majority of the houses in both sub-groups the formal is found in the front part of the interior and the informal ones at the back as expected. Furthermore, the fact that both categoric differentiation as well as relative position have a plus value indicates that the plan of the contemporary Cypriot house is neither flexible nor innovative in the way functions are assigned to spaces.

Despite the similarities between the houses considered as groups, the specifics of each house do reveal that there are houses which tend to differentiate the formal from the informal in stronger ways than other houses. In fact, all things considered, six out of the eight architect houses and nine out of the sixteen client houses tend to blur the above mentioned distinction, while the rest of the houses in each group tend to emphasize it using one or more of the means examined above. The proportion of architect houses blurring it is clearly higher than the corresponding proportion in the client sub-group suggesting that architects do tend to weaken the distinction.

3. The attitude and impact of each agent

The information in the interviews regarding the specifics of each case, together with the results of the spatial analysis allow for an assessment of the attitude and consequent impact of each of the agents.



Figure 2: Houses of architect Psilos, client Petros and client Pantelis

1st Triad: Architect Psilos attempts to differentiate between formal and informal functions by curving the space around an element such as the fireplace, the display piece or the TV stand. In his house the kitchen and the informal dining room are indeed found behind a permanent piece of furniture, the display piece, but they are also separated from the rest of the spaces by glass doors. The architect initially attempted to place the kitchen in the front of the house but the idea was rejected by his wife. This curving of space is found, in its purest form in the house of client Pantelis who now feels the informal could be slightly separated from the formal by a piece of furniture to accommodate the TV and sound system. The house of client Petros also exhibits a curving of space but only between the entry hall and the living room, while the kitchen and the informal dining room are in one room and the saloon and the formal dining room are in another. It could thus be concluded that the architect wishes to distinguish between the formal and the informal by more subtle means rather than creating bounded spaces or rooms.

Architect Psilos seems to attempt, through design, a closer fit between space and use. Client Pantelis must have had the same attitude during design, but seems to wish for a stronger distinction between the formal and the informal after living in the house, despite the fact that his family's lifestyle rarely if ever includes any formal events. This has clearly been the attitude of client Petros during design since he asked for a strong separation between formal and informal functions, not because this matches his family's social life but apparently because this is the way he and his wife believe a house should be. The architect stopped supervising the construction because the clients decided on changes without his consent which consequently altered the aesthetic character of his design.



Figure 3: Houses of architect Athos, client Allos and client Akos

2nd Triad: Architect Athos is clearly more preoccupied with the volumes which compose his architectural designs rather than the accommodation of the needs of the user; he now admits that the design of his own house does not allow for parties of more than five people since the saloon, which is a separate volume protruding in the garden, can only seat this number. The insistence of the architect to use one of the rooms as an interior garden with a skylight in the house of client Akos, despite the fact that the house has an interior courtyard, and more importantly, despite the client's argument that he needs as many bedrooms as possible since his sons and their families come to visit frequently, reinforces the suggestion that satisfying the needs of the specific user in each case is not the main priority for architect Athos. Carried away by his expressed desire to deviate from the typical since he and his wife have lived abroad and thus feel they are different from the rest of the Cypriots, client Allos may have found the idea of having only one space to serve both as living room and as saloon interesting, but he now plans to add another room next to the kitchen to serve as an informal sitting room.



Figure 4: Houses of architect Sofos, client Sotos and client Stelios

3rd Triad: Architect Sofos argues that his wife was too young and did not really know what she wanted, so he was the one which took all the decisions. As with both his client houses, the formal is strongly separated from the informal. Client Sotos did not ask for any formal spaces but accepts them as resulting from the specific design chosen by the architect. Client Stelios rather proudly explains that it was he who insisted that the formal and the informal should be accommodated in two levels. He finds the second cooking space redundant but his wife strongly disagrees. Both

find the quite strong division of the house into formal and informal as a waste of space since the formal spaces are rarely used but the wife jokingly explained that people need all these spaces because everybody else needs them and because a space is needed to place the formal set of furniture, as if these are an integral element in every home.

As in the previous case, the architect is here strongly preoccupied with the formal or aesthetic result rather than the needs of the specific user, but unlike architect Athos, he takes the formal-informal relationship for granted. Client Sotos must have initially had a lot of confidence in the architect regarding all aspects of the design, but the relationship went sour, not because of disagreements regarding spatial issues but because of the architect's arrogant attitude regarding aesthetic considerations. Client Stelios and his wife may be able to detect the discrepancy between space and use but are still quite satisfied with the design.





4th Triad: Architect Marios explains that his policy is to satisfy the client, something which he seems to have managed in both cases presented. All three houses have an openness to them, with the living room in the architect's house and the house of client Midas separated from the rest of the social functions by being placed on a different level, while in the house of client Mbalos, the living room, saloon and formal dining room and entry hall are all found on the same level in one large space. The kitchen and informal dining room are found in a separate room in all houses. All three families are satisfied with the result, even though the formal spaces are only used when the number of people exceeds that which can be accommodated in the informal spaces, a quite infrequent occurrence. The spatial configuration in each case was the result of a joint decision-making from both parties who, having the same age, background and social position, tend to have quite similar views and requirements anyway.

5th Triad: Architect Evis claims he tries to point out to the client any problematic elements in the program, and mentions the tendency to have spaces which are not really used, comparing such a situation with someone who has a BMW always kept in the garage while using a Hugo for his everyday transportation needs.



Figure 6: Houses of architect Evis, client Evelthia and client Evlogos

His own house keeps the kitchen and informal dining room in a separate room but the living room, saloon and formal dining room are all found in the same space. Client Evelthia accuses him of focusing on how things look and for insisting on a modern design, ignoring such basics as the dimensions of spaces. She claims she consequently had to give him a sketch of exactly what she wanted, while some spaces had to be enlarged during construction. Her desire to have a house different from the other Cypriot houses since she has lived abroad, seems to refer to the aesthetic aspect since that was according to both parties the main domain of problems between them. The house she ended up with satisfies her in both respects, even though it is, spatially as well as aesthetically, quite typical of Cypriot houses. Client Evlogos described the design process between him and the architect as a dialogue; the architect would present him with drawings which he would study and come up with further suggestions. None of the clients use the formal spaces which, unlike client Evelthia and his own wife, client Evlogos finds redundant.



Figure 7: Houses of architect Notis, client Ntinos and client Nefeli

6th Triad: The wife of architect Notis expressed strong concerns about the openness of the design, worried about the possibility of having a problem with noise but he dismissed her warnings. He now acknowledges that everything can be heard from everywhere but he describes this as a form of "continuous communication" between the family members. Both clients are quite pleased with their house. The house of client Ntinos has only one sitting and one dining area, while the kitchen is totally exposed. The couple explain that they invested in a very powerful ventilation system for the kitchen which should not be separated spatially from the rest of the

living spaces since it is an area of potential social interaction. It should be mentioned though, that they have most of their meals at their parents' house which is located at the back of their own. Client Nefeli's house has, after her own request, a comparatively stronger separation between the formal and the informal. Still, the living room is still in the same bounded space with the formal spaces. Her husband describes how he sits in the living room alone when he needs to relax. She admits it is rarely used, as are the formal spaces but she feels quite satisfied. Yet, on asked whether she would find a second kitchen useful, Nefeli strongly criticizes this tendency, explaining that a house should be fully used, and makes fun of a friend of hers who has a pot of plastic flowers in the sink of the main kitchen since this is never used.

Architect Notis may appear very democratic but his attitude regarding his own house and the manner in which he rationalizes his own preferences reveal traces of architectural determinism. Being quite good with people, he manages to convince client Ntinos who ends up with a totally open house and to a lesser degree client Nefeli, whose house has a living room next to the formal spaces, all of which are rarely used.



Figure 8: Houses of architect Zeus, client Circe and client Panas

7th Triad- More clearly than in any of the other triads here, the spatial configuration in each house is what the owner wanted. The two client houses, with the whole ground floor being practically reduced to a visual effect, strongly reflect the working class lifestyle and social attitude of their owners, while the architect's house literally goes to the other extreme, with the master bedroom on the upper level, open and overlooking the only sitting area in the house.

The inability of an agent to reflect on his own attitude is well demonstrated in the case of Panas, who, while having duplicated the kitchen, informal dining room and living room on the lower level which was supposed to be for parking, described a relative's house as supposedly impressive but impractical since the family uses the garage rather than the main house for their everyday living. He admits that his house is big, demanding too much energy for cleaning but still feels satisfied with it. Client Circe on the other hand describes how much of a learning experience the design of her house was but also expresses how helpless she felt many times when faced with the complexity of the issues. As in the previous case, the informal spaces are duplicated on the lower level near the garage.

Both clients clearly believe that there is a proper way a house should internally be designed in order to be socially efficient while architect Zeus tries to deviate as much as possible from the expected, perhaps ignoring some basic considerations regarding privacy.





8th Triad: The architect's attitude regarding his house, and his insistence to place the garage in the front in the house of client Mary, reveals that he believes that a configuration will sooner or later modify the user's needs. Architect Minos rejected his wife's request to have an informal living room separated from the formal spaces of the house, comparing such an arrangement with museum spaces which are looked at but not actually used. He does not regret his decision even though his wife is still unhappy about the design, arguing that "she should compromise a little and adjust to the existing spaces", rationalizing more his attitude by saying that she will appreciate what he did when the children have left the house and there is no more a need for an informal living room. Client Mary is perhaps the only one in the group who indeed uses the formal spaces in the house. She explains that she needs a separate room for the formal dining room in order to be able to close that space after dinner and have the chance to clean up after the guests have left. Client Machos and his wife are not happy with the fact that the formal spaces, which are clearly separated from the informal ones, are never used and wonder why the same arrangement works well in the case of their parents' house.

4. Conclusions

The results of the spatial analysis, together with the information in the interviews allow for the following general conclusions:

The fact that the houses in the two groups are, regarding the syntax of their spatial configuration, more similar than different, irrespective of who had the stronger impact in its design, suggests that neither the client nor the architect are actually reflective enough on a level which allows them to strongly influence the deep syntactic structure of the design.

The architects in the group tend to feel that they should offer their advice on the program but they more or less accept the specifics of this aspect of the design given to them by the client. Similarly, most clients may welcome the architect's input but feel that they should be the ones to decide on how functions are spatially related. A comparison between the architect's attitude regarding the aesthetic aspect of the house and that assumed regarding the spatial configuration clearly suggests that the former is considered as a much more important element of his work than the latter. The problems arising between differences in aesthetic preferences between architects and clients is well documented. The same cannot be said regarding the spatial characteristics of the house. Thomas Markus argues that historically, architects were encouraged to use their creative energies on form, thus reducing their ability to disturb the existing power structures by questioning the brief or the spatial configurations suggested by the resulting design (Markus 1993: 317).

The attitude architects assume, especially regarding the spatial configuration of their own house, suggests that the majority of the architects in the group wish to create a closer fit between the house and the family's needs as they perceive them to be, frequently ignoring their wives' protests. Indicative of the attitude the architect assumes is revealed by the term used by architect Marios, one of the most democratic of the group, to refer to his wife's contribution; when asked whether his wife was involved in the design of their house, he answered that he had little "interference" from her.

The need to differentiate the formal from the informal takes an extreme form in five of the client houses with the duplication of some or all of the informal spaces somewhere at the back or lower level of the building. Cooking, family dining and everyday living is in these cases taking place in this second set of spaces, leaving the actual house intact and always clean and tidy in case some formal visitor shows up, something that is not really an element of Cypriot social life. This is clearly a result of the conflict between the aspired versus the actual lifestyle of the family. The desire to have a modern open plan ground floor does not agree with the need of the wife to cook for her family and yet have the kitchen sparkling clean at all times. The fact that three of the five houses with this feature, allow for their first kitchen and informal dining room to be closed off from the rest of the house, makes the need to duplicate these spaces even more difficult to interpret purely in terms of user needs.

On being asked to comment on the existence of a second set of informal spaces in many Cypriot houses, even the owners of houses with this feature criticize this tendency but the way they do so clearly reveals that they do not really include themselves in this category of people; the subjects may not only be in a position to detect the discrepancy between use and space but also be sarcastic or joke about it, yet they do not seem to realize that they do exactly what they criticize.

The different attitudes regarding the spatial aspect of the design could be seen as falling into two main types, with a third one representing the middle ground between them:

1) The Would type; a cause and effect, deterministic relationship is taken to exist between the built environment and social praxis. Architects 4/8: Athos, Notis, Zeus, Minos. Clients 1/16: Ntinos. These houses tend to reduce the distinction between formal and informal functions. Architect Athos acknowledges the problems in his design but still feels the house should cater for the everyday rather than the more rare social needs of the family. Architect Notis and Minos ignore their wives' complaints, still hoping that the spatial will eventually dictate the way the family perceives and uses the house. Architect Zeus and his architect wife are so far pleased with the design but it should be pointed out that their son is still quite young, so his social life does not conflict with theirs yet. Client Ntinos may be quite satisfied with the totally open plan, perhaps partly due to the fact that they have no children, while his parents-in-law live at the back and do all the cooking.

2) The Could type; a weaker version of the Would type, since choices regarding domestic space are seen as potential originators of social change. Architects 3/8: Psilos, Marios, Evis. Clients 4/16: Pantelis, Allos, Sotos, Mbalos. All three architects seem to accept that a family's needs include more than the bare practical but also exhibit a desire to manipulate the spatial, by slightly reducing the distinction between the formal and the informal. Clients Pantelis and Allos may have believed that they could bring a closer fit between spatial configuration and social life through the design but tend to desire a stronger separation between the formal and the informal after they have lived in the house for some time. Sotos went the other way, being persuaded by his architect to have a set of formal spaces he did not ask for.

3) The Should type; decisions are grounded on what is perceived as the appropriate, ethical or even natural. Architects 1/8: Sofos. Clients 11/16: Petros, Akos, Stelios, Midas, Evelthia, Evlogos, Nefeli, Panas, Circe, Machos, Mary. Apart from the house of client Akos which presents an exception (a renovation of a vernacular structure), all the houses of the agents in this category create a strong distinction between the formal and the informal. From these, only the lifestyle of client Mary fits this spatial arrangement, yet only client Machos and to a lesser degree client Evlogos express concern about the discrepancy.

If the Is represents the real situation, then this is the combined effect of the resulting spatial configuration, the actual lifestyle of the users as well as their feelings regarding the result. The spatial configuration matches the actual lifestyle of the user who is also satisfied with it only in one case (client Mary). From those who have formal spaces which are not really used, creating a discrepancy between space and use, all are satisfied except client Machos and client Evlogos. In the houses which reduce the distinction between the formal and the informal, there is in all cases a closer fit between use and space, yet the wife is in some cases dissatisfied, preferring a stronger separation.

The results thus suggest that a closer fit between the spatial characteristics of the house and the actual use of the spaces does not necessarily result in a higher degree of owner satisfaction. On the contrary, what is suggested is that a purely logical, one-to-one correspondence seems to ignore the complexity of what are perhaps misleadingly referred to as needs, a term which is thought to exclude the unnecessary. Still, the attitude of most of the architects in the group seems to contain traces of architectural determinism.

The above observation reveals a weakness in the architect's expertise regarding the design of domestic space. Keeping in mind the subconscious component in any human activity, design can be described as a comparatively deliberate enterprise, requiring the assessment of an initial situation, the definition of specific goals and the selection of the means to achieve them. Can the architect be considered as the expert who should carry out all three tasks? Always referring to the social and not the aesthetic, what makes him more knowledgeable than the client in the assessment of the initial situation and the definition of targets? The architect may be experienced in designing houses, but the clients are also, to say the least, familiar with domestic space. Clearly, the client needs the architect mainly to translate what he wants into architecture, and not to decide for him how to live. What the client may lack is the ability to reflect on his situation, consequently weakening any conscious attempt to modify it. The architect may then be the person to explain how architectural design

could influence the user's life and then present him with alternatives. As research suggests though, architects rarely get any feedback regarding their design assumptions, since post-occupancy evaluations are not common, while in most cases they do not visit the houses they design some time after these have been inhabited. His education may be providing him with the skills to manipulate form and space in order to achieve certain aesthetic qualities but he does not seem to be equally trained to deal with the spatial as the architectural parameter which links the design with social use; as the findings indicate, the architect cannot be considered knowledgeable in the manipulation of the deep syntactic spatial configuration of his designs, let alone predict how this aspect will influence the social.

That the architectural is linked with the social can hardly be disputed, but the specific nature of the link does not seem to occupy an important, if any place in architectural education. If this is not corrected, then the architect cannot be considered as the agent who should be dealing with the design of space for social use, unless the product is supposed to be experienced strictly in an aesthetic sense. Research in semiology though, suggests that even the aesthetic cannot be totally divorced from the social aspects of taste, weakening the architect's position as an expert, pointing to the need of examining closer the nature of architectural knowledge and potentially redefining architectural design itself.

References

Hanson, J., 1998, *Decoding Homes and Houses*, Cambridge, Cambridge University Press
Hillier, B., Hanson, J. and Graham, H., 1987, "Ideas are in things: an application of the space syntax method to discovering house genotypes", *Environment and Planning B : Planning and Design*, 14, 363 - 385
Hillier, B. and Hanson, J., 1984, *The Social Logic of Space*, Cambridge, Cambridge University Press

Markus, T., 1993, *Buildings & power: freedom and control in the origin of modern building types*, London; New York, Routledge