

Institutional Space, Domestic Space, and Power Relations:

Revisiting territoriality with space syntax

Julia W. Robinson University of Minnesota

s2

In an investigation of a range of residential buildings from houses to institutions, it has proven useful to combine space syntax methods with the territorial gradient as a way of revealing important differences. Hillier and Hanson justifiably criticize many supporters of the theory of territoriality, and the concept of the territorial gradient for assuming its universality and for assuming that people will function collectively as they do individually (1988: 6-7). Nevertheless, in conjunction with considerations of numbers of people using spaces, the social role of the user, and the syntactical structure of interior spaces, the territorial gradient has proven to be a useful tool to reveal the spatial structure of institutional power relations of types of housing within a particular cultural context.

The work presented here is part of a larger study of institution and home motivated by de-institutionalization. This movement sought to remove people from the large “total institutions” described by Goffman (1961) that impeded normal patterns of living, and to place them instead in “normal” housing in ordinary community settings. Different from the approach often taken in space syntax analysis where a large number of similar particular historical examples are used to develop a detailed pattern of genotypes and phenotypes (Hillier and Hanson, 1984, Hillier, Hanson, & Graham, 1987, Hanson, 1998), here a limited number of contrasting housing examples were investigated to understand gross differences across a great range of housing

Exploring the validity of a polarity between institution and home found in earlier research in which student subjects evaluated images (Robinson et al 1984), twenty-nine housing examples from a Midwestern city in the United States were selected to represent a range of institutionality. (Robinson 1988, Thompson, et al 1990, Robinson et al 1992, Robinson 1997). The research documented the housing using photographs and drawings as well as a variety of physical measurements that included an inventory of architectural elements with over 1000 variables supplemented documentation of the housing with photographs and drawings. Cluster analysis of the variables showed that while the buildings assessed from photographs to be at the home pole were physically similar to each other creating a unified point, the more institutional buildings were not only different from the home pole, but were increasingly different from each other. Space syntax analysis is one of the methods subsequently used to compare the different arrangements of spaces in the types of housing.

Keywords:
Domestic space,
territorial gradient,
institutional types,
housing

**Julia Williams
Robinson,
Department of
Architecture, 254
Nicholson Hall,
University of
Minnesota, Minneapo-
lis, 55455
Tel: 612-624-5733
robin003@tc.umn.edu**

s2.1

The space syntax analysis is applied as follows. (1) Gamma analysis diagrams are drawn from the perspective of the building entrance since we were focusing on relations with visitors. (2) A single space is defined by its function (e.g. space name, by visible furniture) and the presence of actual or implied physical barriers (e.g. walls, partial walls, room shape). (3) The building is taken to be a discrete unit, exterior spaces are studied relative to the interior, and analogous exterior spaces are used to describe the interiors of large residential buildings. This creates some impurity in the analysis but permits portrayal of several significant distinctions between settings. In the study of territoriality space syntax methods were augmented by (4) including the numbers of people potentially using a space and (5) altering the social roles considered in analysis. The stranger-inhabitant duality used in several previous studies (including Hillier and Hanson 1988, Peatross 1994, Graham, 1997) was expanded to permit differentiation between two types of inhabitants –residents and workers- and strangers are called visitors.

Power and Spatial Structure in Buildings

A fundamental attribute of institutions as they are manifest in buildings seems to be that of structured power over the building occupants (e.g. Foucault 1979[1975], Markus, 1993, Peatross, 1994). We could even define institutionality as the degree to which an institution enforces its rules and systems upon its inhabitants, and expresses its separateness from and importance to the outside world by means of built form. While the degree to which the building can be said to “determine” behavior is an ongoing discussion that we will not engage in here, suffice it to say that buildings seem to play an important role in supporting, impeding and directing behavior (Hillier 1996:183-5) and thereby to empower some people and to dis-empower others. In our spatial analysis of institution and home we are primarily concerned with the manner in which the building empowers the resident as an individual and as a member of the social group inside the residence and the social world outside. In this view, domesticity, in contrast to institutionality, might be expressed as the degree to which a building empowers its occupants individually and collectively and expresses its relatedness to the outside world.

The concept of a powerful societal force that dominates human action from the top down is implicit in much of the scholarship on space (e.g. Foucault 1979, De Certeau, 1984), but using a slightly different set of assumptions, we postulate that power is a field that *can* be polarized, but isn’t necessarily so. Unlike magnetic fields, which offer only two poles, positive and negative, the field of political power has many possible poles. It is true that traditionally circumstances have tended to concentrate power at a particular pole or center in a dialectical relation to the powerless, but at least in theory circumstances can also disperse power evenly among many centers.

Therefore, the polarization of power reflected in the spatial organization of patterns that we normally use to create buildings is not inevitable. If we can conceive of ways to use environments to distribute power rather than concentrate it we may be able to design places that support different, more democratic forms of institutional organization. Here we use the normative pattern of the Midwestern US domestic environment as a model for distributed power.

The United States Dwelling Pattern as a Prototype

The ideal of the single family residence, or house, is such a strong part of American culture that it pervades American thinking (and, influenced by the electronic media, international thinking) about housing. Even though tremendous differences in living patterns exist between people based on such things as geographic location, household membership, ethnicity, economic status, class, occupation and age, for most people in the United States the free-standing house is the icon for “home” as well as standing for the idealized form of dwelling. Not only does the house visibly mark the boundaries between the household unit, and the world outside, but also typically long-term inhabitants have owned the house, so that it represents the desired attributes of control and independence combined with permanence and roots. The coincidence between the form of the house and its relation to neighborhood with the underlying ideal of the self and its relation to community reinforces both. The layers of space within the house and between the house and the street create a kind of gradient from the most intimate space of the individual to the public arena where the life of the urban community takes place (see Illustration 1).

s2.3

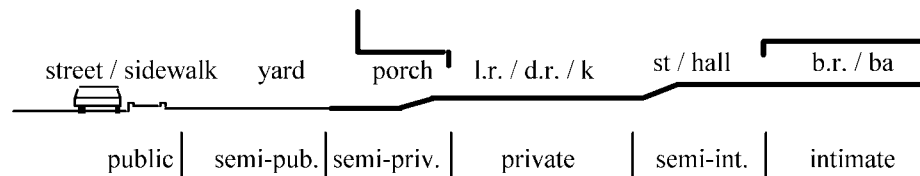


Illustration 1 The Territorial Gradient in the Single Dwelling (Diagram by Hank Liu)

When the number of houses is limited and the view of the street from the houses is clear, single family housing districts function effectively as self-regulating communities. Houses typically hold from 1 to 6 people (U.S. Bureau of the Census, 1992), and the typical block-long street with houses on both sides will hold anywhere from 10 to 30 houses, generating about 30-100 people. In these places, the areas between the houses becomes a semi-public neighborhood space where children may ride their bicycles on the sidewalk, or run freely from yard to yard. Under these same viewing circumstances, front porches create a kind of extended semi-private area open to the semi-public neighborhood territory.

At the interior of the dwelling, control of territory within the house occurs differently in the private areas and in the intimate areas. Whereas the shared private areas are controlled by the group in a general way, and temporarily by individuals, the intimate areas are controlled by individuals, some spaces temporarily (bathrooms), others exclusively (bedrooms). Household community control is exerted at some periods of the day when, in a given area, house-

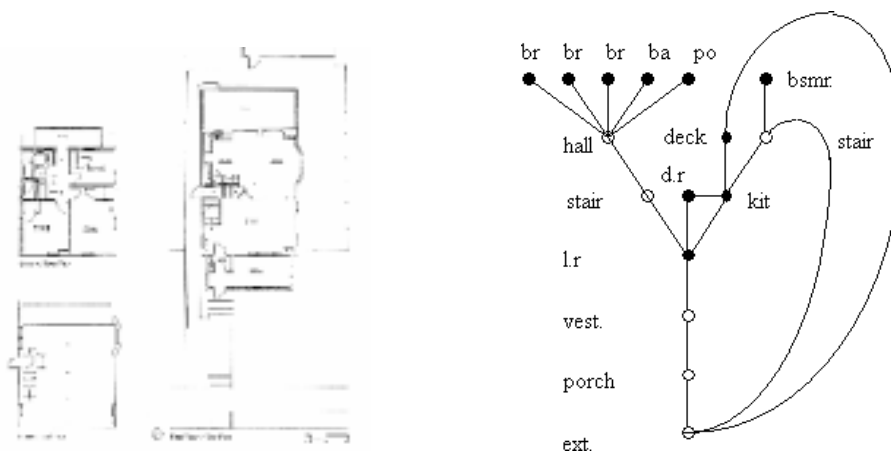
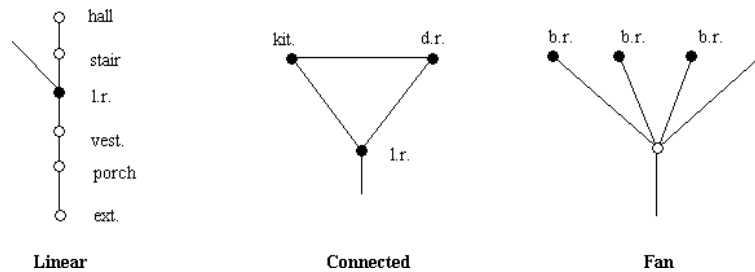


Illustration 2. A Typical Traditional American Single Dwelling Plan and Space Syntax Diagram

Illustration 3.
The Space Syntax
Diagram Dissected
 (Illustration by Hank
 Liu)



hold members do something together, like eating a meal or watching television, or do different things at the same time, like one person reading a book and another one sewing. Due to the relatively open spatial structure, many regularly occurring community activities tend to evolve gradually rather than having to be scheduled.

The structure of the house contributes to the demarcation of the household as a private community, and to the development of community cohesion and individual territory, and the pattern of informal relations between people, spaces and time. Applying space syntax methods to the single family house as discussed earlier, we find that three characteristic spatial arrangements that we call linear, connected, and fan-shaped, relate to specific parts of the territorial gradient and to 3 different social purposes (shown as dissected syntax diagrams in Illustration 3):

1. The spaces connected in a linear pattern relate to patterns of movement, such as the separation of the public outdoor areas from the dwelling.
2. The connected arrangements link the shared private living areas, typically living room, dining room and kitchen.
3. Fan-shaped arrangements link the intimate spaces, typically bedroom and bathroom.

In the Midwestern domestic building these distinctive arrangements seem to reflect three distinct spatial categories and territorial types, *public*—linking to the outside world, *private*—relating to community activities within the residence, and *intimate*—activities linked to the individual.

In the house, the territorial gradient is not only characterized by a hierarchy from public to intimate but also by three different types of spatial relations. The three different patterns reflect the intimacy gradient and their relation to the activities. The linear pattern of the entry represents the transition between outdoors and the semi-public areas inside the private territory. Its depth and control reflect the desire to separate the two domains and restrict entry. The connected community spaces are highly integrated and shallow with respect to each other and to the entry sequence enables informal interaction of household members. The segregation and shallowness of the fan shaped relation between semi-intimate and intimate areas with respect to each other reflects the competing desires for individual control and awareness of others. The depth of the intimate spaces with respect to the entry reflects the territorial gradient between public and intimate spaces in a house.

The Territorial Gradient

In the case of the single family house in the urban neighborhood that we have described, the territorial gradient seems to support the development of self-regulating community among residents who desire to have it. For example, as the number of people with which the resident interacts increases, the distance from the intimate territory increases. In institutional

buildings that house larger numbers of people and supervisory workers, the spatial sequences work somewhat differently. But a territorial gradient that would permit comparison of the free-standing dwelling to other forms of housing must take into account factors additional to spatial considerations (location, spatial linkage and sequence, dimension) such as numbers of people, activities and social role of participants. The following discussion forms the basis for the territorial gradient described in Illustration 4.

There is evidence from archaeology and anthropology that community group size is related to its type of governmental structure. For example, authority figures do not seem to be required to maintain social order in groups of several hundred people or fewer, but once over 500 they appear to be obligatory; and at a population size of about 1000-1500 police functions begin to be necessary (Naroll 1956: 687-715, Trigger ND: 97). Hunting and gathering groups seem to maintain a size between 20 and 40, at which point they subdivide, with the number 25 sometimes being called the “magic number” for such groups (Hassan 1981:53, Lenski and Lenski 1974:104). Additional evidence supports the influence of size on such activities as crime prevention in residential buildings, (Newman 1972: 69, 72) and quality of dormitory life (Baum and Valins 1977). Although the scale of the group and of the space it occupies are not the only determinants, there does seem to be an important relation between group size and the ability of a group to function with informal governance.

Applying population numbers to territoriality in housing can be linked to human experience. The fewer people that one meets on a regular basis, and the more frequent the meeting, the greater the likelihood that one will recognize the person, which makes informal control possible. Thus in a group over about 25, it is likely that most of members of the group will be known superficially, while in an intimate or private group it is likely that all people will be known relatively well. By combining the observations about governance and population scale with that of territoriality, we can develop a concept of community self-regulation that is related to housing design. Three general realms of socio-spatial concern can be defined: *public*, where anyone has a right to be, *private*, which is under the jurisdiction of ownership or other more limited control, and *intimate*, which is the area of the individual. Research and observation suggests that these realms relate to the numbers of people that any one person can know or recognize. This obviously varies from person to person and from context to context. For the United States context, if applied with concern for the particulars of a given case, the approximate numbers given here may be useful.

When the public, private and intimate realms are related to architectural domains that occur in the single household or apartment dwelling, we identify seven such domains. Each is associated with proposed typical population scales to form the spatial gradient from intimate to public, that we hypothesize to be a territorial gradient (see Illustration 4). In American society, when the inhabitant or resident controls the space of an apartment, there is a differentiation between:

1. The public civic domain, like a main street where the numbers can augment to 500 people or more (the domain of strangers, open to public access, where anyone can go),
2. The public neighborhood domain, the set of side streets and main streets that make up a defined subsection of the larger urban, suburban or rural unit a group from 100 to 500 people (the domain of shared interest, where anyone can go who appears to have reason)

3. The semi-public or collective domain, the street, block, comprising from approximately 5-30 people (where anyone can go who appears to have a reason, but where neighbors may feel they can confront someone who appears to be unsanctioned or acting inappropriately)
4. The semi-private domain, the lawn, porch or entry (area adjacent to the private area which is controlled by the occupant, and where anyone who goes needs a potential sanction from an occupant),
5. The private, domain, the living room, kitchen or dining room) occupied by from 1-6 residents plus invited guests (the communal part of the private area, where an occupant has already sanctioned a visitor's presence
6. The semi-intimate domain, the hall related to the bedrooms and bathrooms (area shared by the household group where a visitor must have permission to be)
7. The intimate domain, the bedroom or bathroom (the exclusive domain of the individual, where a visitor must be invited to enter).

s2.6

Domain (urban analogue)	Terri. Access	Dist	Use	Occupancy	Responsible Entity	Social Control	Environmental Control
1.Public-Urban (city, sub,town)	Everyone	500'+	500+	Temporary	Municipality	Hired staff/ police, Formal rules/ laws	Accessibility Visibility Implied boundaries
2. Public-Neigh (neighborhood)	motivated	1-500'	100-500	Intermittent	Neigh Org	Hired staff/ police Formal rules/ laws	Accessibility Visibility Implied boundaries
3. Semi-Public (street/block)	motivated	1-300'	30-100	Intermittent	Street/block neighbors	Recognition Cultural conventions	Accessibility Visibility Implied boundaries
4. Semi-Private (lawn, porch)	sanctioned	1-100'	5-30	Intermittent	Adjacent neighbors	Recognition Cultural conventions	Accessibility Visibility Implied boundaries
5. Private (lr, dr, kit, etc.)	Invited by group	1-40'	1-12	Permanent	Household	Household conventions	Enclosure, Locked door
6. Semi-Intimate (hall to br& ba)	Invited by group	1-25'	1-6	Intermittent	Household	Household conventions	Visibility, Implied separation
7.Intimate (br & ba)	Invited by individual	1-15'	1-2	Permanent	Individual	Household conventions Personal dominance	Enclosure Door (Lock- toilet/ bathroom)

Illustration 4 The Territorial Gradient: Domains of Control and Inhabitation

The Territorial Gradient Applied to Various Types of Housing

In the American architectural literature the territorial gradient has become an accepted design pattern that is presently popular with those practicing the New Urbanism. Those who have studied the space syntax of urban environments have sometimes questioned its validity as a pattern from which to develop urban form, suggesting that its defensive posture doesn't reflect the importance of the free movement of strangers to creating a healthy, secure public environment. However, from the perspective of the individual resident, the layers of territorial gradient permits monitoring the access of the stranger to the private abode, and its link to limited numbers of people enhances the ability of the individual to identify with the different layers of neighborhood group. The territorial gradient defines layers of spatial territories relative to the pattern found in the Midwestern US house.).¹ In comparison to

¹The concepts and terms selected here draw directly upon the work of Alexander et al (1977), Altman (1981), Altman and Chemers (1980), Chermayeff and Alexander. (1963), Davis and Altman (1976), Newman (1972), El Sharkawy (1983), and Sprague (1991). The new names given here include my own terms of "intimate" and "semi-intimate" (reconceptualizing Sommer's and El Sharkawy's personal space, subdividing it into two different kinds of space), derived from existing uses of space, and a reinterpretation of public domains to include 3 rather than just two so that the distinctions can be made between space shared with the adjacent neighbors (a semi-private relation) the near neighbors (the semi-public group that share a street, for example), the larger neighborhood or region within the geographic unit, and the geographic unit itself, city, suburb, county, etc. This greater differentiation reflects the complexity that was noticed in our comparison of large scale buildings to the typical U. S. residential pattern.

other housing types, this permits identifying not just the depth to the carrier space, but the richness or paucity of territorial control and potential for creating group interaction between the deepest spaces and the exterior.

When we locate the interior spaces of institutional buildings on the territorial gradient (see Illustration 5) we discover a variety of violations of the gradient created by institutional efficiencies, made in the name of economy.

Intimate space is probably most commonly violated. The bedroom, when it becomes a ward or barracks clearly denies the potential for intimacy. Also, shared bathing and toilet facilities, where there is more than one toilet, sink, bath or sink infringes upon normal intimate boundaries. The lack of auditory privacy in these communal hygiene territories is very disturbing (usually such places are all hard surfaces so the least sound is advertised far and wide), and when, as in prisons, there is not even a modesty barrier, it is punitive.

Semi-intimate space is a common site of infringement. What would normally be semi-intimate space, the corridor linking bedroom to bedroom and bath, is often, as we have seen, a place of public activity, opening onto the communal living room, and in some buildings is a place where one can be forced to confront strangers.

Private territory, where the small group gathers to create a sustainable intimate community is rarely provided in institutional buildings. Economies of scale increase the people sharing the community space to such a large number that the limits of intimacy are intolerably surpassed. Even when private such spaces are provided, their segregation (placement in discrete rooms distant from the shared circulation path with doors for auditory and visual separation) generally prohibits informal naturally occurring interaction, and to function depends upon scheduled activity.

Semi-private territory, defining the edge between the unit and semi-public territory is nonexistent in most institutional settings. The definition of institutional residents as members of a group rather than as individuals or as small communities of individuals militates against the kind of personalization or identity of group with unit that normally takes place in the semi-private territory. Mail, for instance, may not be delivered to an individual box, which would otherwise link the subgroup or individual to a particular place within the larger context. The doorbell, which notifies the inhabitant of a visitor, is rarely part of an institutional structure.

The distinction between **semi-public territory and public territory** which is manifest in the private dwelling is sometimes apparent in institutional buildings and sometimes negated. When there is a control point beyond which not everyone may pass, and when the numbers of people who pass such a control point are smaller than approximately 30, a semi-public territory may be said to exist. The existence of semi-public territory requires that a neighbor can be differentiated from a neighbor. Many institutional buildings have such a large number of people using them that semi-public territory cannot be said to exist. In these instances, the building becomes fully public except for the private and intimate spaces whose character is compromised by having to come directly off of the public territory.

The investigation of the structure of the different kinds of housing shows two attributes of inhabiting linked to organization of spaces: the ability of the household and its neighbors to create social ties, and related to this, the ability of the individual to control access to the building spaces. The development of social ties is supported by providing loosely

s2.7

REALM	PUBLIC			PRIVATE		INTIMATE	
DOMAIN	Public Urban	Public Neighbrhd	Semi-public Neighbrhd	Semi-Priv Neighbrhd	Private Household	Intimate Household	Personal Intimate
Proposed GroupSize	500-1000	100-500	25-100	6-25	3-6	2-3	1-2
Barracks (40)	st	wlk, lr, d	en	br, ba			
Prison cell (1000)	st, en, str	hl, lr, d	hl				br, ba
Motel (500)	st	wlk					br, ba
Hospital (600)	st, wlk, lby	hl	hl				br, ba
Nursing Home (300)	st wlk	lby, el-str	hl-lr			br	ba
Dormitory-hall (100)	st, wlk	lby, el-str, d	hl, lr, ba	lr		br	
Dormitory-suite (100)	st, wlk st, wlk	lby, el-str, d	hl	lr		ba	br
Group Home (16)		st, wlk	en	lr-k-d, hl, ba		br	
Mid-highrise (680)		lby, el-str	hl		l-k-d	hl	br, ba
Rooming house (30)		st, wlk	en, el-str	hl	ba		br
Walk-Up Apt (24)		st, wlk	lby, str	hl	l-k-d	hl	br, ba
Row Hse (3)		st	wlk		l-k-d	hl	br, ba
Freestndg House (3)			st, wlk		l-k-d	hl	br, ba

s2.8

Illustration 5
Domains of Control
for Different Types of
Housing²
Key: st=street,
wlk=walkway,
lby=lobby, el-
str=elevator-stair,
hl=hall, en=entry,
lr=living room/lounge,
l-k-d= living-dining-
kitchen, br=bedroom,
ba=bath

structured, highly visible spaces with clear territorial boundaries and an identifiable level on the intimacy gradient. The institutional buildings can be seen to violate the territorial gradient in one form or another.

Institutionality and Empowerment in Various Housing Types

Several of the patterns of institutionality of different buildings are visible in this comparative analysis. The disruption of the privacy gradient reveals how constructing buildings for large numbers of people and to enable supervision may disrupt the ability of residents to control their own territory and to develop the group structure necessary for informal resident control of the building. The patterns of the different building types relative to the territorial gradient shows differences between categories of residence that can be defined as punitive, fully institutional, partially institutional, and domestic with institutional characteristics.

Buildings in which people sleep and bath in involuntary groups larger than 6, can be said to violate societal norms since no intimate or private space can be said to exist. Such exclusively public buildings can be called punitive, and require constant rigorous supervision by staff.

Those buildings that lack private space and directly juxtapose public and intimate realms can be described as fully institutional (typically hospitals, motels and hotels, nursing homes). Although these permit some degree of personal control, depending upon the building design, they offer no chance to create the kinds of small group cohesion that supports territorial control, and therefore security within the building again requires constant staff supervision.

Buildings that have some private space, but also have gaps in the privacy gradient seem to be of two kinds: those where the gradient is missing between the intimate realm and the semi-private realm, which we will call partial institutions, and those with a gap between the household realm and the public realm which are not institutions but housing that exhibits some institutional characteristics.

² Since this chart is dependent upon rather gross assumptions about population, the figures used as assumed population included. The size of the building selected to represent a building type will affect how it would be placed on this chart. Some other assumptions are that bedrooms shared by non-related adults are assumed to be semi-intimate, and that bathrooms (in the American context including toilets) that do not have multiple fixtures are assumed to be since the space is controlled by one person at a time.

Partial institutions do not intentionally inhibit socialization, although through their design and placement of spaces for interaction they may do so unintentionally (often these areas are segregated and distant from informal gathering points). Generally they have too many people using certain spaces, such as hallways and living rooms to be controlled informally, so that while the entire building may not require supervision, these spaces require staff presence in the building.

The last category, domestic housing with institutional characteristics is best exemplified by the apartment building with a corridor. It is not truly institutional, since there is a complete intimacy gradient within the dwelling unit. However, outside the dwelling this kind of building exhibits aspects of loss of control by the resident because of the large amount, length and invisibility of the semi-private corridor territory which makes it difficult for the resident to control. Some forms of apartment building and other domestic buildings with institutional characteristics may be amenable to informal control, but other forms require workers for adequate security and thus have more institutional characteristics. Society has come to understand that institutional settings are not appropriate for long-term inhabitation, but exactly what is destructive about them continues to be revealed. A comparison of various housing forms with the spatial structure of the freestanding house has permitted identifying some of the mechanisms that support institutionality. The typical American residence is spatially structured to support resident autonomy within a small social group, and to provide to the individual a large measure of control over time, space, activity and social interaction. Conversely, in other housing settings spatial structure permits the varying kinds and degrees of control over the resident that can be described as degrees of institutionality in buildings. The territorial gradient has shown how space interacts with other factors to create these degrees of institutionality in different types of residential structures. It is hoped that through improved understanding of the spatial and other mechanisms that reproduce the top-down form of power defined as institutionality, it will be possible to avoid reproducing these problematic buildings and instead to develop spatial and social structures that empower the resident as does the free-standing house.

s2.9

Citations

- Alexander, Christopher, Sara Ishikawa, and Murray Silverstein. 1977. *A Pattern Language*. New York: Oxford University Press.
- Altman, Irwin. 1981. *The Environment and Social Behavior: Privacy, Personal Space, Territory, Crowding*. New York: Wadsworth.
- Altman, Irwin and Martin M. Chemers. 1980. *Culture and Environment*. Cambridge UK: Cambridge University Press.
- Baum, Andrew and Stuart Valins. 1977. *Architecture and Social Behavior*. Hillsdale, NJ: Lawrence Erlbaum Associates
- Chermayeff, Serge, and Christopher Alexander. 1963. *Community and Privacy: Toward a New Architecture of Humanism*. New York: Doubleday.
- Davis, G. and I. Altman. 1976, "Territories in the work-place: Theory into design guidelines," *Man-Environment Systems* 6:1 pp46-53.
- De Certeau, Michel. 1984. (Translator Steven F. Rendall) *The Practice of Everyday Life*, Berkeley and Los Angeles, CA: University of California Press.
- El Sharkawy, Hussein M. . 1979. *Territoriality: A Model for Architectural Design*. University of Pennsylvania Ph.D. Thesis. Ann Arbor, MI: University Microfilms International.
- Foucault, Michel. [Trans. Alan Sheridan]. 1979[1975] *Discipline and Punish*, New York, Vintage Books.
- Goffman, E. 1961. *Asylums: Essays on the Social Situation of Mental Patients and Other Inmates* Chicago: Aldine. (Garden City, NY: Anchor Books, 1961)
- Graham, Mark. 1997. "Public and Private in the Roman House: The Spatial Order of the *Casa del Fauno*," in *Domestic Space in the Roman World: Pompeii and Beyond*. Ray Laurence and Andrew Wallace-Hadrill (eds.), Portsmouth, RI: Oxbow Books.
- Hanson, Julianne. 1998. *Decoding Homes and Houses*. Cambridge, UK: Cambridge University Press.
- Hassan, Fekri A. 1981. *Demographic Archaeology*. New York: Academic Press.
- Hillier, Bill, 1996. *Space is the Machine*. Cambridge, UK, Cambridge University Press.
- Hillier, Bill, and Julianne Hanson. 1984. *The Social Logic of Space*. Cambridge, UK: Cambridge University Press.
- Hillier, B, J Hanson, H. Graham. 1987. *Ideas are in things: An application of the space syntax method to discovering house genotypes*. *Environment and Planning B: Planning and Design*, 14, pp 363-385.

- King, Anthony D. (ed.). 1980. *Buildings and Society: Essays on the Social Development of the Built Environment*. London: Routledge and Kegan Paul
- Lenski, Gerhard, and Jean Lenski. 1974. *Human Societies: An Introduction to Macrosociology*. New York: McGraw-Hill.
- Naroll, R. 1956. "A preliminary index of social development" *American Anthropologist*, 58.
- Newman, Oscar. 1972. *Defensible Space*. New York: Macmillan.
- Peatross, Frieda Dell. 1994. *The Spatial Dimensions of Control in Restricted Settings*. Georgia Institute of Technology Ph.D. Thesis, Ann Arbor, MI: UMI Dissertation Services
- Robinson, Julia. W., Klensin, J., Bermudez, J. & Johannes, M. 1992 "Probing Terminology for Cultural Categories: Institution and Home," in Mazis, A. Karaletsou, C. and Tsoukala, K. (eds.) *Socio-Environmental Metamorphoses: Proceedings of the LAPS 12 Conference*, Thessaloniki, Greece: Aristotle University, 180-89.
- Robinson, Julia. W. 1988 "Institution and Home: Linking Physical Characteristics to Perceived Qualities of Housing," in van Hoogdalem et al (eds.) *IAPS 10/1988 Looking Back to the Future/ Se Retourner Vers L'Avenir. Volume 2: Symposia and Papers*. Delft, The Netherlands: Department of Architecture, Technical University.
- Robinson, Julia W., 1997. "A Tale of Two Descriptions: The Architectural Inventory Measure and Syntactical Analysis of Plans" In C. Depris and D. Pichu (eds.) *Housing Surveys: Advances in Theory and Methods*, Centre de Recherche en Aménagement et Développement, Université Laval, Québec, 157-174.
- Robinson, J., T. Thompson, P. Emmons, M. Graff, & E. Franklin 1984. *Towards an Architectural Definition of Normalization: Design Principles for Housing Severely and Profoundly Mentally Retarded Adults* (Research report). Minneapolis, MN: School of Architecture & Landscape Architecture & Center for Urban & Regional Affairs, University of Minnesota
- Thompson, T., J. Robinson, M. Graff and R. Ingenmey. 1990. "Home-like architectural features of residential environments." *American Journal on Mental Retardation*. 95 (3): 328-341.
- Sack, Robert David, 1986. *Human Territoriality: Its theory and History*, Cambridge, UK: Cambridge University Press.
- Sprague, Joan F. 1991. *More than Housing: Lifeboats for Women & Children*. Boston: Butterworth Architecture.
- Trigger, B. ND. "The archaeology of government," *World Archaeology*, 6:1, pp. 95-106
- U.S. Bureau of the Census .1992. *Statistical Abstract of the United States: 1992 (112th edition)*, Washington, D. C