

# The question of social potential in space use

69

**Zoe Georgiadou**

Technological Educational Institution, Greece

## **Abstract**

This paper deals with the construction of a question on the theoretical basis of space syntax. The fieldwork concerns the interior space in buildings used for children in residential care, in Greece. It focuses on issues of social behaviour and co-presence, correlated with certain strategic choices of spatial design, and the organisational configuration of the fixtures and settings of the institutions.

The question is explored at two levels:

At the first level, it studies the relation between the practical use of interior space and the density of human presence, with empirical methods of non structured field observation, informal field observation and interviews; the checking and description of the layouts and building function; the mapping of human activities, both formal and informal; space occupancy; and the collection of background data concerning the physical ambience and atmosphere of the institutions.

At the second level the findings are associated with the basis of space syntax analysis, in order to articulate a hypothetical question that sustains them. The syntactic analysis techniques used are: the convex map representation; selected local and global connections; the concept of mean depth and justified depth map; the isovist analysis occurring in areas with high human density; and the view ability of integrated spaces from staff spaces.

The findings from this study suggest that space control is implicated in the potential drift of both qualitative and quantitative characteristics that determine everyday life in the institutional environments. Thus, although this criterion does not exist in the prevailing design guidance, it seems that it is an important variable that affects behavioural normalisation in institutional environments for children.

## **Keywords**

children's home,  
institutionalisation,  
control of space

69.1

zoegeo@teiath.gr

## 1. Introduction

Questions about the use of space may arise when designing an environment for children. Institutions for children in residential care have based their built environment on a general frame of organisational elements, ideas, and principles amongst which the concept of ‘normalisation’ of the physical surroundings has a positive value, as against ‘institutionalisation’ (Mazi-Papasotiriou 1983)<sup>1</sup>. The expression of these ideas in interior space constitutes an arena of strategic design choices from which the participation of the real users of the space (staff and children) is conspicuously lacking. Thus, design that is realised in the building may be endorsed or altered and re-arranged through daily activities, within the frame of an “architecture of inevitable relationships”(Markus 1993). The study of the correlation between qualitative human relations and the potential ability of the space configuration to sustain them was one of the aims of this research.

69.2

The point of departure is a sample<sup>2</sup> of five units for children in residential care in Greece, out of eight institutions, consisting a category “Pedopolis”, operating under the aegis of the National Welfare Organisation and the Ministry of Health<sup>3</sup>. These units share the same aims, regulations and organisational principles through two building types. Three of them, the older ones, derive from the custodial institution model, “total institutions” within extended monolithic premises (Figure 1). Two function in the newer version of the “village theme”, with a core of common areas and dispersed independent dormitories<sup>4</sup>(Figure 2). Both organisational types include extended surrounding grounds (Table 1).



**Figure 1: St. Barbara: Plan of the third floor with resident rooms and dayrooms, back elevation.** (Source: Record of plans in National Welfare Organization, author's photograph)



**Figure 2: St. Helen: General plan, dormitory building.** (Source: Record of plans in National Welfare Organization, author's photograph)

Name	Number of entries	Number of entries in use (7,30-15,00)	Number of entries in use after 15,00	Number of closed entries
St. Barbara	13	3	1	10-12
St. Andrew (main bldg)	7	4	1	3-6
St. Andrew (admini. bldg)	3	2	0	1
St. Olga (main bldg)	5	2	1	3-4
St. Olga (out- bldg)	6	6	0	6
St. George (common bldgs)	11	11	1	0-10
St. George (dormitories)	3	1	1	2
St. Helen (common bldgs)	17	15	3	2-14
St.Helen (dormitories)	3	2	2	1

**Table 1 General information about the institutions of the sample**

## 2. The empirical research

The empirical research is based on non-structured field observations, informal extended field observations, and interviews, both formal and informal. Further information about the human behaviour was gathered by behavioural mappings and trackings, known as “naturalistic field observation” (Adams & Schavaneveldt 1985, Iwin & Bushnell 1980)<sup>5</sup>.

The building data collection included the architectural plans and their verification. All functional changes, extensions of spaces, alterations, additions and differences in the early plans have been recorded.

The human behaviour mapping was spread over a four-day observational period for each unit and was timed to coincide with 15 hours activity daily. The activities were recorded on the plans, in order to describe the frequency and location of certain types of behaviours. The pre-scheduled routine with activities such as morning reveille, meals, food preparation, departures, programmed obligations, etc, were carefully distinguished from informal activities such as natural communication, free movement, children’s games, etc, illustrating the informal characteristics of inmates and staff behaviour (Goffman 1961)<sup>6</sup>. These activities relate to three groups of people: children, residents, staff, and external visitors, both moving and interacting. The findings were represented on tables for the aggregate period of observations with the demarcations mentioned<sup>7</sup>.

The research focused on two issues. The first was related to the closing-up of a great number of entrances in total institutions. In the three cases of the sample that have a common building setting, the main entrances are placed on the ground floor and the services in the basement. All three buildings allow alternative routes in their interior space, from several points into the building, leading to antechambers or lounges (from main entrances), corridors, ancillary spaces, or activity rooms (from secondary or emergency exits).

Analytically, St. Olga has five entrances into the main building and six into the out-building; St. Barbara has thirteen entrances; St. Andrew seven into the main building and three into the administration building. The investigation detected that a number of entrances-exits are not in use, but the rest are in use during the day when administrative staff are present, and are locked after their departure. The closing-up of entrances-exits is not correlated with changes required for additional needs, apart from a lounge turned into a study room.

In the second category of “village institutions”, as they are referred to, there are two types of building groups: the independent dormitories, and the cluster of common services. St. George has eleven prescheduled entrances for the second cluster, and St. Helen seventeen entrances, all in use during the morning, until 15.00h. Both institutions reduce the number of entrances in use after 15.00h. having one and three entrances respectively, with only a few spaces where the access is allowed. Thus, the internal circulation concentrates upon the use of the shared payphone, or the preparation of dinner in the kitchens. The two-floor dormitories in each unit have three entrances from different levels, because of level changes on the ground. In the present situation, only one of them remains in daily use for St. George and two for St. Helen, all three of them placed on the ground floor. (Table 2 )

Name	Number of entries	Number of entries in use (7,30-15,00)	Number of entries in use after 15,00	Number of closed entries
St. Barbara	13	3	1	10-12
St. Andrew (main bldg.)	7	4	1	3-6
St. Andrew (admin. bldg.)	3	2	0	1
St. Olga (main bldg.)	5	2	1	3-4
St. Olga (out- bldg.)	6	6	0	6
St. George (common bldgs.)	11	11	1	0-10
St. George (dormitories)	3	1	1	2
St. Helen (common bldgs.)	17	15	3	2-14
St. Helen (dormitories.)	3	2	2	1

**Table 2. Number of exits-entries into the buildings**

The second issue that the research has pointed out focuses on the practical differentiation of the use of internal space. Thus, in total institutions as well as in the two-floor buildings of dormitories, several differences were detected, in terms of use of space, as well as boundaries between places for administrative staff and “care assistants”<sup>8</sup>.

When compared, the three “total institutions” have many similarities as well as certain differences in space occupancy and use. The ground floor appears to contain administrative uses (such as offices for the clerks or the professional staff) or dining area, the basement services or technical uses (such as kitchens, laundries, boilers, etc.) or dining area, and the top floor, which is either the first, the second or the third, depending on each premises, residents rooms, lounges, nurse and care assistants room.

69.5

The observations of movement demonstrated a high presence of children in expected points, concerning formal daily activities and programmes. The informal activities of children were located in the deeper residents rooms or lounges of the system, for St. Barbara and St. Olga. These institutions have the strictest rules for using the surroundings. In St. Andrew these activities are accommodated in the basement, or the surrounding area where access is occasionally allowed.

The formal movement of care assistants is spread along the corridors as movement and supervising activity, but it is also detected as free interaction in particular places, such as the nurse’s room in St. Olga, where almost all the care assistants are gathered every afternoon, or into the social worker’s office, where high density of free co-presence for both care assistants and children is observed every afternoon in St. Barbara.

An additional comment refers to the boundaries and inequalities between care assistants and other staff members. The findings suggest that in all “total institutions” there are spatial limitations, even for auxiliary activities such as laundries and kitchens, and access is unrestricted in only a few areas during the afternoon. In the “village institutions” this last point, is also confirmed in the common buildings. The limits in the built environment apply to both care assistants and children. The informal activities are necessarily spread in the surrounding areas because of the distribution of activities in many buildings.

The dormitories are generally similar in their interior spatial organisation. The residents lounge is the place where a high level of formal and informal activity has been noticed. Some residents' rooms are used as socialisation spaces, where the children meet to talk and play. The care assistant room is not usually used in all the dormitories.

During the empirical research two additional methods were used to evaluate the social atmosphere. The first method was based on structured questionnaires about the social environment in restrictive settings (Moos 1973, 1974, 1975). The interviews succinctly illustrated the perceptions of the personnel to the social environment. The responses represent approximately 40% of the total population of care assistants and children in care. The results demonstrate the lack of balanced relationships, encouraging and supportive attitudes, and reveals frequent tensions and frictions between staff members and children in four of the five institutions of the sample.

The second method was based on a research by Morris (1969)<sup>9</sup>, during a study for the mentally retarded. The qualitative evaluation of the basic personal furnishings, environmental conditions, and comforts that are obvious in a domestic environment, is achieved by using two indicators "the environment index" and the "amenity index". The first includes elementary equipment such as: bed, bedside table, locker, study desk, seat and environmental aspects such as unpleasant smells, satisfactory heating, natural light and ventilation, as well the number of children sharing the room. The "amenity index" includes ornament, curtains, decorative touches, personal possessions (books, toys, plants, flowers, pictures, photographs, lamp), and also satisfactory cleanliness. The higher evaluation between the two indexes, with the few variations, was observed for the "environment index". The "amenity index" was very low, under 50% for all the premises of the sample, due to their poor, dreary, colourless, institutional environment. (Table 3).

Name	Environment index	Amenity index	Average
St. Andrew	51-58%	43%	48-53%
St. Barbara	69-81%	50%	63-71%
St. George	85-91%	48%	73-77%
St. Helen	74%	50%	66%
St. Olga	70%	50%	63%

**Table 3. Environment and amenity index in percentage**

### **3. The construction of the question**

The empirical research has illustrated quantitative and qualitative aspects of the interpersonal and built environment, in these institutions for children in residential care. The evidence that was lacking, was the correlation between the topics investigated, in order to form an interpreting hypothesis. The recording of human

activities, either scheduled or adventitious, provided a sufficient basis to clarify, quantify and interpret the patterns of space occupancy and through them the ability of the layouts to facilitate and support social co-presence. The remaining issue was to define the crucial criterion, the question where the fieldwork could be focused.

This question was studied using the theoretical basis of space syntax. The analysis techniques used are convex map representation, selected local and global connections, the concept of mean depth and the justified depth map, isovist analysis occurring in areas with high human density, the viewability of integrated spaces from staff areas and the concepts of reversed buildings, weak and strong program buildings (Hillier, Hanson 1984, Hanson 1998, Peponis 1991,1993,1999, Benedikt 1979).

### **3.1 Entries and depth.**

69.7

The convex map representation was the first analytical technique used to present the settings. Secondly, justified depth maps were provided using all the available entrances in three different daily periods, as suggested through the empirical research. Thus in all three “total institutions” of the sample, the alteration of the architectural design, which relates to in the limitation of the entrances in use, and the reduction of alternative circulation, reveals the following observations. All three maps of the original architectural plans are comprised of spaces that lie on “trees”, especially from the carer space, leading to the residents’ rooms. These tree like diagrammatic presentations have very few programmed internal rings in their deeper spaces. The more ringy circulation is restricted to the shallow parts of the system, relating to spaces for common or administrative use (Figure 3). In the situation found during the morning period (07:30-15:00) the reduction in the number of entrances increases the depth of the system and eliminates most of the rings, giving a strong tree like representation, with few distributed parts. (Figure 4). During the afternoon and the evening, the use of the fewest possible entrances, usually one (sometimes with staff permission as happens in St. Barbara) forms a rigid tree with lack of internal rings, where all the parts of the system are non- distributed (Figure 5). Consequently, the mean depth of the system and the relative depth of the residents’ spaces have been increased from 2.50 to 4.50 intervening spaces.

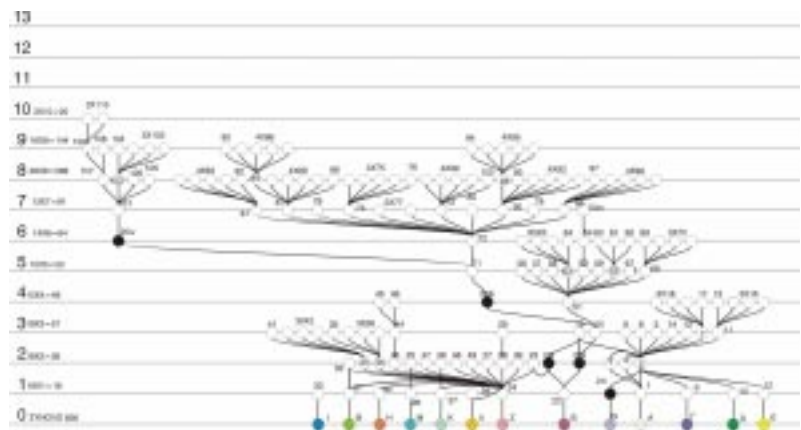
In the “village institutions” the common cores seem to have different justified maps, characterised by the numerous entrances-exits and circulation through the buildings and the surroundings. Almost all the scheduled alternatives remain in use in the situation that occurs during the morning period. After 15:00 the reduction of entries and spaces, gives a rigid tree-like diagram with few spaces available. The mean depth increases from 0.97 to 2.29 intervening spaces. The new categorical

children. In the dormitories the justified maps reveal the greatest increases of depth, noticed in all the institutions of the sample. The maps remain the same during day and evening, with 4.58 intervening spaces more, than in the former plans. (Figure 6)

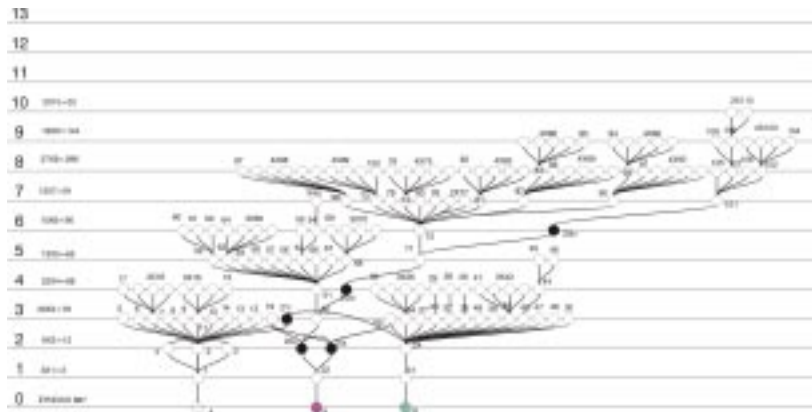
The analysis of the buildings suggested that the spaces most likely to turn deeper into the system, with one-way circulation, are the residents' rooms. In the following table the variations of depth concerning the residents' rooms are described. (Table 4).

69.8

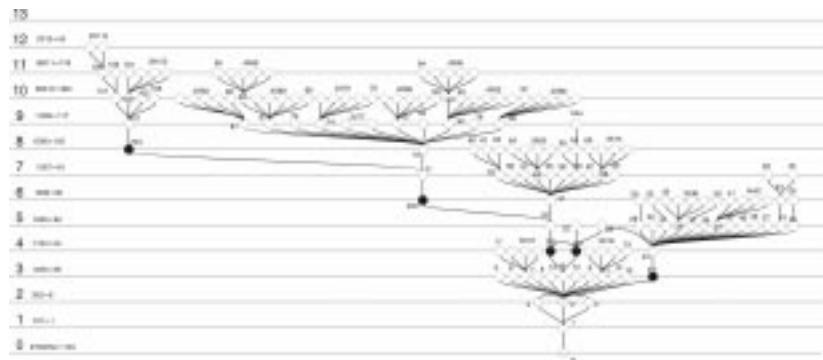
**Figure 3: St. Barbara: Former architectural design. Justified depth map, representing five floor levels**



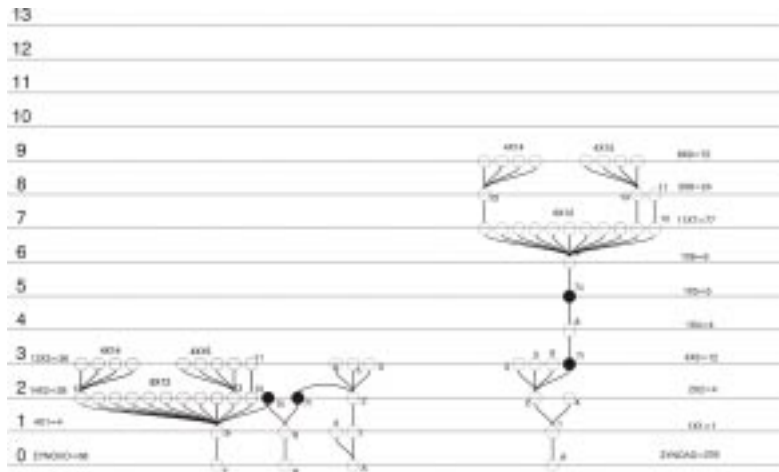
**Figure 4: St. Barbara: Function during the period 7,30 –15,00. Justified depth map, representing five floor levels**



**Figure 5: St. Barbara: Function after 15,00. Justified depth map, representing five floor levels**







**Figure 6: St. George: Typical dormitory building. On the left: former architectural design, justified depth map. On the right: Current situation, justified depth map**

Name	Depth of former plans	Depth of dormitories in the current situation	Differences of depth
St. Andrew	4.70	6.75	+2.05
St. Barbara	5.43	9.68	+4.25
St. George	2.26	6.83	+4.57
St. Helen	2.67	7.25	+4.58
St. Olga	3.99	6.13	+2.14

**Table 4. Variations of depth for the resident rooms.**

69.9

The first finding from this analysis refers to the differentiations of the interior configuration and manipulation of the circulation. The way that the built environment change suggests a succession of elastic and rigid limits, depending on which category of user, “inmates” or “visitors”<sup>10</sup> is using a certain space. The justified maps are similar in the three “total institutions” becoming shallower or deeper occasionally. The obvious reason for these changes is the ability of the staff to supervise the circulation paths and create a clear simplified spatial structure, which is mentioned in similar cases to this study (De Syllas 1989, Peatross 1994, Hanson 1998)<sup>11</sup>. The same researchers suggest that the “spatial form of the building may enable or restrict movement and co-presence among its residents altogether from the most integrated places in the layout”<sup>12</sup>. Thus the simplification of the system is a reasonable explanation in the case of the three “total institutions” of the sample. However, it does not cover the case of the small premises of the dormitories in the “village institutions”, where the design has favoured simple structures, distinguishable areas, and clear patterns of movements and circulation.

The interventions seem to be more drastic in those buildings with strong programmes, than the extended buildings which tend to have weak programmes. Strongly organised buildings are those in which behaviour is governed by strict rules by comparison with the opportunities for informal associations that a “weak”

program building could provide. The more a building is extended, the more “it becomes more and more difficult to maintain as a strong programme building...so the amount of un-programmed contact as the natural by-product of functionally defined movement is also likely to increase”(Hillier, Hanson, Peponis 1984)<sup>13</sup>. These issues seem to construct the first level of a hypothesis. Despite the absence of the issue of control among other spatial requirements, it seems that it forms a critical criterion for design and spatial configuration.

In the large more “institutional” buildings, with many floors, numerous entries-exits and rooms, a complex structure and complicated circulation, the efforts to manipulate human behaviour are expected. In smaller two-floor “homelike” dormitories with a clear structure, functional areas and internal circulation, the drastic interventions that are noticed point out the issue of embedded spatial control. This hypothesis is also corroborated by the findings about the social climate of the empirical research, which has revealed poor relationships and built environment, even in this apparent own literal organisational type. Despite the absence of the issue of control among other spatial requirements, it seems that it forms a critical criterion for design and spatial configuration.

### **3.2 Human presence**

In this frame the hypothesis cannot be apart from the Human density and opportunity for uncontrolled contact between the main input of the buildings needs to be taken account of for each category. Thus inequalities between the “inhabitants” and “visitors”, and underlying inequalities between the different categories of “inhabitants”, seem to be a lever for forming new patterns in space occupancy, functioning and controlling the built environment. This can form the second level of the hypothesis described above (Figure 7). The most powerful category of inhabitants, the administrative and professional staff, has free access to all the parts of the system. Even the technical staff IS close to access all of the auxiliary spaces, but the care assistants are the explicit category under control, with a low ability to use and circulate freely in all spaces.

But the issue of control is deeper than the application of authority. As Peatross (1994) notices “There is a distinction between rule and practice between what behaviour ought to be and what it is. Space can be made to map organisational aims and to reproduce in spatial structure specific intents”. It appears that the inequalities described, become more critical as more entries or rooms are isolated, and as more paths are curtailed, as much as the building entity is subdivided in areas.



Figure 7: St. Olga: Informal human presence into the first floor

Concluding, the care assistants seem to invent increasing restrictions against moving between the internal space and surroundings, or between different floors, in order to control the “visitors”, since they, themselves have limited resources. This is the case in St. Barbara institution, which has the most extended settings among the total institutions of the sample, where the only free entrance is locked after 15:00 and the care assistants mostly sits near the entrance, watching everyone who tries to reach it.

69.11

### 3.3 Isovist fields

The result of the internal space analysis, and representation of formal and informal space occupancy during the fieldwork, isovist field analysis was added (Benedikt 1979, Benedikt and Burnham 1984)<sup>14</sup>. Movement was contained in all institutions deep in the residents’ facilities. Also high human densities and presence of the staff, were noticed in corridors, the most integrated parts of the settings. These two factors are used for the choices of isovist fields. Two kinds of visual field analysis have been used: individual isovists, from points that represent either the supervisory of corridors, or seem to offer the widest visual fields carrying out the higher dense of inmates presence. The set of isovist fields investigation were also drawn to demonstrate the surveillance potential for with the space configuration of a whole (Peponis 1998)<sup>15</sup>. Visual fields from areas where care assistants are unwillingly found, correlate with the viewability of the integrated parts with the un-restricted supervision of the entire space. In fact every care assistants’ room that does not cover this requirement is the unoccupied, and replaced with another room that offers this ability.(Figures 8, 9). For instance the recurrent use of nurse room in St. Olga as a place where care assistants gather every afternoon, or the unused care assistants’ room in St. Andrew (Figure 10), seem to have a logical explanation. The functional reformation of certain places thus detected, could be predictable, in the first level of internal design.

69.12



Figures 8, 9: St. Olga: Isovist field from the current and the prescheduled pedagogical room

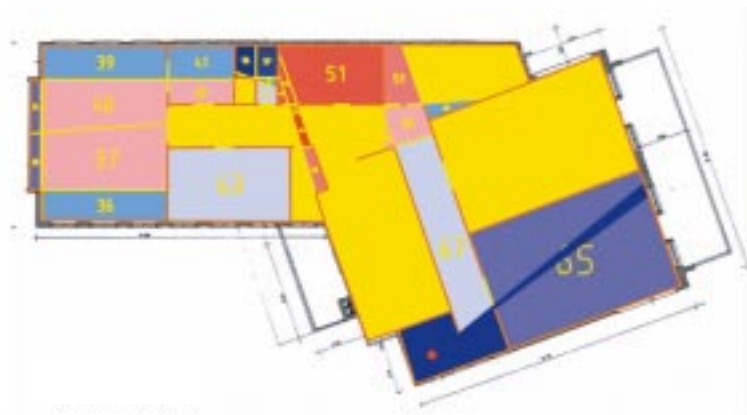


Figure 10: Isovist field from the unused currently pedagogical room

The comparison between several composed isovists and the findings of the empirical research both the differentiations in the architectural plans and the social climate, seem to connect the deficiency of space with more or less unsupportive supervision?. These buildings, which are not able to change to new patterns of space

occupancy, in spite of their layout or integration, are deficient in their ability to respond to the requirement for normalisation. The main contribution of the isovist analysis is the validation of the empirical options of vantage points by the care assistants, which have those characteristics that can facilitate an active, continued and relaxed supervision of as wide and integrated area, as possible. Thus this evaluation has answered the first level of the question about the issue of spatial control.

#### **4. Conclusions**

The question postulated, under the circumstances that the methodological tool of space syntax analysis has pointed out, seems to be centralised to the spatial dimensions of supervision and control on one hand, and to the material shell of everyday life and its significance on the other hand. The recognition of the organisational aims through spatial configuration, as well as the prescheduled and programmed, but also the revealing informal correlations, lead result in the articulation of new patterns of spatial relations. This new network of relations underlies the official architectural design and enforces certain aspects of everyday life.

In all the institutions of the sample in spite their organisational system or size, the reversed genotype was reinforced by the inhabitants, with modifications so that the deeper parts of the system turned to deepest, inaccessible and under control. Through the spatial analysis of the mean depth and justified maps of the buildings, it became obvious that in both organisational types, “total” and “village” institutions, the modifications embedded by the inhabitants, focus on the creation of a domain with the least number of connections and circulation paths possible. The participation of the surroundings seems to be a crucial restriction between total institutions and villages. In the “village theme” the use of surroundings cannot be as ordered, because of the organisational system and increases the opportunities for social stimulation. This does not affect the interior space in the subdivided buildings, which are easily manipulated.

The access to the deepest residents’ rooms become one-way circulation, without alternative rings. This was more effective in home-like dormitories with strong programmes. Conclusively, though controlling intentions appear in all settings, it seems that the practical modifying abilities define a limit that is inversely proportional to the size and the programme of the facilities.

The formal behaviour mapping illustrated similar activities in each organisational type studied, with variations correlated to human informal co-presence and density. The visual field analysis in these specific areas, where free socialisation

was detected, revealed the relation between this fact and the ability of continuous considerate supervision of the integrated parts of the system. The same analysis exposed the empirical choice of vantage points in order to achieve the widest visual fields correlated with densely occupied human areas, and through them the predictability of certain conduct. The degree of effectiveness and supportiveness of the settings towards these issues, is found to be affected by the potential for spatial flexibility in providing new solutions. It seems that in settings where internal configuration produces easily supervised areas, positive opportunities for less rigorous control and autonomy are offered. On the contrary, configurations that subdivide internal space into differentiated areas, affects negatively this procedure, restricts independent movement and through this reduces the opportunities for socialisation. On the other hand, the inequalities traced between staff categories is a finding but it is not entirely clear how it would or could affect spatial design.

69.14

The furniture & fittings in all the institutions of the sample, even in the newer ones is aged and neglected. In addition in the last thirty years the entire system of residential care in Greece demands commonly accepted innovations, for which these sample buildings are not yet adapted. In the absence of these adaptations space is used to support, successfully or not, questionable principles. In spite of this, the usefulness of the analytical method lies between the systematic definition of spatial dimensions in social practice and the spatial predictability of behaviour in restricted settings. This shows that, although the debate between distinct scientific areas about social behaviour has a strong base, the questions about how space configuration affects a goal like normalising behaviours, remains unanswered. Even if the request to “Close the residential care institutions” is put into practice, the value of design decisions will still remain to sustain the ideas of inhabitation.

#### Notes

<sup>1</sup> Mazi- Papatiriu, S., 1983, *Architecture and institutional practise: The relation between social and spatial configuration of institutions for disabled people*, PhD Thesis, Faculty of Architecture, Aristotle University of Thessaloniki

<sup>2</sup> The sample was selected out of the total number of existing institutions with the following criteria: Institutions should be run under the aegis of the same organisation, in order to have the same organizational rules, financial sources and principles. Also should keep records of the former architectural plans, for the buildings. Should allow access, both in records and to the human environment. Finally should illustrate the two organisational systems in use.

<sup>3</sup> The lack of studies in the context of architectural design of institutional facilities for children in Greece led to field research. The descriptive portrayal of the building type was based on a fieldwork that has covered 50 premises representing 65% of the total population of buildings. The fieldwork took place during the period 1991-95 as part of a project funded by the Technological Educational Institution of Athens (TEI-A). This fieldwork has provided the basis for identifying a variety of problems and issues, which can form the subject of further research. Georgiadou, Z., 1999, “Space in institutions for children in Residential care in Greece”, *Mentor*, Volume 1, Athens, Pedagogical institute, pp.163-194

<sup>4</sup>The field research pointed out that only 13% of the institutions function in the village system, which was established first in U.S.A. during the 19th century. This system was transferred to many European countries, with several varieties. It was based on the deconstruction of the total institution by revealing a new model of inside social structure. This was believed to be the tool to obtain normal environments. The rest 87% function in the “total institution” model, described.

<sup>5</sup> Adams, G., Schavaneveldt, J., 1985, *Understanding research methods*, N. York, Longman, p. 238  
Iwin, D. M. and Bushnell, M. M., 1980, *Observational strategies for child study*, Holt, Rinehart & Winston

<sup>6</sup> The human behaviour in space use, and specifically in “total institutions” cannot be completely predictable and structured. Goffman pointed out, that an informal life is developed within the margins of custodial environments. Goffman, E., 1961, *Asylums, Essays on the social situation of mental patients and other inmates*, Pelican, London

<sup>7</sup> In the research activity and movement were recorded with two tints of the same colour (dark and light) for each group of people, which cannot be presented in black and white iconography. Thus, green was used for external visitors, red for children and blue for the members of staff generally.

<sup>8</sup> The term refers to the staff working directly with children. This category includes members of the staff, usually high school graduates, without professional education. The other categories of the staff are: professional (social workers, psychologists), administrative, technical, auxiliary, part time educational. The field research showed that only 10-24% of the total population of staff is working directly with children, and most of the institutions do not employ professional staff, **except the category of pedopolis.**

<sup>9</sup> Morris, P., 1969, *Put away, a sociological study of institutions for the mentally retarded*, London, Routledge, pp. 76-99

<sup>10</sup> In terms of the spatial logic of space

<sup>11</sup> Peatross, D., 1994, *The Spatial Dimensions of Control in Restrictive Settings*, Ph.D. Thesis, Georgia Institute of Technology.

De Syllas, J., 1989, *Aesthetic Order and Spatial Disorder in Children's Home*, M.Sc Thesis, University of London

Hanson, J., 1998, *Decoding Homes and Houses*, Cambridge University Press, London

<sup>12</sup> Hanson, J., *ibid.* p. 283

<sup>13</sup> Hillier, B., Hanson, J. and Peponis, J., 1984, “What do you me by building function?” in Powell, J., Cooper, H. and Lera, M. (eds.), *Designing for building utilisation*, London, Spoon, pp. 61-72

<sup>14</sup> Benedikt, M. L., 1979, “To take hold of space: Isovist and Isovist fields”, *Environment and Planning B*, 6, pp. 47-65

Gibson, J. J., 1966, *The senses considered as perceptual systems*, Boston Mass, Houghton

Benedikt, M. L. and Burnham, C. A., 1984, “Perceiving architectural space: from optic arrays to isovists”, in W. H. Warren and R. E. Shaw (eds.), *Persistence and change*, Hillsdale L.J. Lawrence Erlbaum

<sup>15</sup> Isovist analysis was facilitated by “Spatialist”<sup>16</sup>, a computer program developed by Peponis and his colleagues at the Georgia Institute of Technology (1998). Spatialist (Version 1,0) Peponis, J., Wineman, J., Rashid, M., Batna, S., Kim, S. H.

## References

Adams, G. and Schavaneveldt, J., 1985, *Understanding research methods*, N. York, Longman

Benedikt, M. L., 1979, “To Take Hold of Space: Isovists and Isovist Fields”, in *Environment and Planning B*, Volume 6, pp. 47-65

Benedikt, M. L. and Burnham, C. A., 1984, “Perceiving architectural space: from optic arrays to isovists”, in W. H. Warren and R. E. Shaw (eds.), *Persistence and change*, Hillsdale L. J. Lawrence Erlbaum

De Syllas, J., 1994, *Living in the Community: a Study of the Domestic Life of People with Learning Difficulties Living in Social Authority Hostels*, NHS Estates

De Syllas, J., 1989, *Aesthetic Order and Spatial Disorder in a Children's Home*, M. Sc. Thesis, University of London

Georgiadou, Z., 1999, “Space in institutions for children in Residential care in Greece”, in *Mentor*, Volume 1, Athens, Pedagogical institute, pp.163-194

Goffman, E., 1961, *Asylums. Essays on The Social Situation of Mental Patients and Other Inmates*, Penguin, Pellican Books, 7th Ed., 1978

- Hillier, B. and Hanson J., 1984, *The Social Logic of Space*, London, Cambridge University Press
- Hillier, B., Hanson, J. and Peponis, J., 1984, "What do you mean by building function?", in J. Powell, H. Cooper and M. Lera M. (eds.), *Designing for building utilization*, London, Spoon, pp.61-72
- Iwin, D. M, Bushnell, M. M., 1980, *Observational strategies for child study*, Holt, Rinehart & Winston
- Markus, T. A., 1993, *Buildings and Power, Freedom and Control in the Origin of Modern Building Types*, N. York, Routledge
- Mazi- Papatotiriou, S., 1983, *Architecture and institutional practise: The relation between social and spatial configuration of institutions for disable people*, PhD Thesis, Faculty of Architecture, Aristotle University of Thessaloniki
- Morris, P., 1969, *Put away: a sociological study of institutions for the mentally retarded*, London, Routledge
- Moos, R., 1974, *Evaluating Treatment Environment: A social ecological approach*, N. York Wiley
- Moos, R., 1975, *Evaluating Correctional and community settings*, N. York, Wiley
- Peatross, F., 1997, "The Spatial Dimensions of Control in Restrictive Settings", in *Proceedings of the First International Symposium on Space Syntax*, 2, 14.1-14.16
- Peponis, J., 1997, *Chorographies, the architectural construction of meaning*, Alexandria Press, Athens, p. 186

69.16