SOCIAL AND SPATIAL PATTERNS OF CULTURAL HERITAGE

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ABSTRACT:

This paper is concerned with the ways in which traditional settlements are studied and analyzed in order to facilitate knowledge, interpretation and consequently presentation and preservation of cultural heritage. More specifically, the relation between space organisation and social/cultural behaviour is investigated, in order to establish the significance of man - made space for the understanding of cultural heritage. Research undertaken through a series of studies (Charalambous 1992, 2002, 2004) has revealed that we still do not have agreed definitions of cultural presence or data in relation to the physical space, to help us determine which elements most aid a sense of cultural presence. We do not have a clear mutual understanding of what is exactly the relation between cultural information and the built environment and how to analyse it, provide for it or communicate it. In order to understand what can be disseminated in terms of context, content and audience, we need to discuss and define what the author considers a major issue in cultural heritage: the relationship between built form and culture. The analysis of built form in such a way so that we understand the transmission of culture through it, is the focus of this paper. It is suggested that the relationship between built form and social organization (the embodiment that is, of tradition) of traditional settlements and urban sites could be further analyzed and subsequently interpreted, utilizing a new methodology; the latter combines both quantitative and qualitative methods of analysis, bringing together both humanistic and technical viewpoints through the incorporation of social concerns in spatial analysis.

1. Introduction

Visualisation has been defined as an attempt *"to form a mental image of something incapable of being viewed or not at that moment visible… (Collins Dictionary)...a tool or method for interpreting image data fed into a computer and for generating images from complex multi-dimensional data sets" (*McCormick et al, 1987).

Ancient structures have suffered severe damages throughout the centuries and it is therefore extremely difficult to visualise their original state. Virtual heritage projects, aim to "recreate" or "reconstruct" the past, what is not at this moment visible, through three-dimensional modelling and animation. Virtual reconstructions facilitated by emerging digital technologies are undoubtedly an important tool of cultural heritage presentation and preservation.

The most commonly used model of reconstruction of an archaeological site utilizes a number of specialists, with various backgrounds in different disciplines. A typical team, depending on the particular site studied, usually includes archaeologists, historians, architects, anthropologists, sociologists and multimedia experts. An experienced multimedia team is involved in the creation of the three dimensional representations, with the necessary know-how to virtually bring to life the archaeological site. Such a team usually consists of graphic designers, animators, video specialists, sound engineers and multimedia programmers of all kinds.

The aforementioned team will aim in creating an interpretation as close as possible, to the original physical structure of the monument. The outcome of such a research usually focuses on virtual reconstructions of the examined monument in such a way so that the visitor, through the use of a multimedia computer can experience the site by viewing three-dimensional representations and virtual reality walk-through.

A disadvantage of this model of virtual reconstruction, is that for years it has focused on delivering realistic structural representations, utilizing the evolution of the technologies involved in such a process, without taking into account humanistic concerns, such as the relationship between built form and culture.

Consequently, in detailing the processes employed in creating projects with narrative delivery of history, which employ graphical and audio effects to immerse its end users in decades of cultural heritage, we also need to consider the emergence of decidedly humanistic concerns. One can characterize these as "the ethics of virtual history". These include the challenge of making the right choices in preserving authenticity while engaging the targeted audience, balancing historical realism against rational necessity in creating choices and completeness within the limitations of digitally constructed environments.

Virtual heritage should not merely be the recreation of what used to be there; what used to be 'there' was more than a collection of physical objects. Virtual heritage environments should be concerned not just with recording and preserving, but mainly with the transmission of cultural information. There is already a large body of work on how artefacts and sites are best recorded and preserved. There is still work to be done on what is cultural information, how it can be interactively experienced, how it is best experienced and learnt (Champion 2005).

Recent research has suggested that virtual environments that aim to preserve, explain and inform on culturally significant places need to do more than replicate objects; they need to replicate the processes that made those artefacts culturally significant (Champion 2005). In other words, virtual heritage should be about visualizing a culture through its artefacts.

However, we still do not have agreed definitions of cultural presence or data to help us in determining which elements most aid a sense of cultural presence. The evaluation of cultural presence, cultural significance, cultural understanding, and cultural learning is therefore problematic. We do not have a clear mutual understanding of what exactly is cultural information and how to provide for it or communicate it digitally. In order to understand what can be disseminated in terms of context, content and audience, we need to discuss and define what the author considers a major issue in virtual heritage: the relationship between built form and culture. The

analysis of built form in such a way so that we understand the transmission of culture through it, is the focus of this paper.

2. Culture and Built Form

If the cultural geographer Yi-Fu Tuan is to be believed, culture is that which is not seen.

"Seeing what is not there lies at the foundation of all human culture".

Such a definition raises an interesting paradox for the visualisation of past cultures. How do we see what is not there? There are many issues in the presentation of culture: one is the definition of culture itself; the second issue is the understanding of how culture is transmitted.

According to Rapoport, without trying to define culture, one can say that it is about a group of people who share a set of values, beliefs, a worldview and a symbol system that are learned and transmitted. These create a system of rules and habits which reflect ideals and create a life-style, guiding behaviour, roles and manners as well as built forms (Rapoport 1969; 1986).

"It can be suggested that "culture" is both too abstract and too global to be useful. Social expressions of culture, such as groups, family structures, institutions, social networks, status relations, and many others, often have settings associated with them or are reflected in the built environment. While it is virtually impossible to link culture to built form ….it is feasible to relate built form to family structure, clans or societies, institutions, sex roles, or status hierarchies." (Rapoport 1969; 1986).

What distinguishes one environment from another is the nature of the rules embodied or encoded in it. These rules must themselves be identified with the formation and organization of space, time, meaning and communication. Then, we are more concerned with the relationship among the elements and underlying rules than with the elements themselves (Rapoport, 1990). In reality, whether it is at the settlement or at the building scale, the man-made environment is formed by similar elements, like the house, the street, the cul-de-sac, or the room, the hall, the courtyard: but differs from one culture to another by how these elements are organized and their meanings.

Kent also suggests that the use of space and architecture is a reflection of the socio-political organization of a society (Kent 1984; 1990). Culture is seen through her work, as composed of integrated parts, subsystems or components such as the socio-political organization. These parts together articulate with behaviour and specifically the use of space, in such a way that behaviour can be viewed as a reflection of culture. Concomitantly, cultural material (a more encompassing term than material culture) such as architecture, is a reflection of behaviour and ultimately of culture.

Kent also developed a model for studying the relationship between culture and space use based on two premises: a) social complexity determines space organization and the built environment, particularly with regards to partition; b) when society becomes more socio-politically complex, its culture, social behaviour, space use and material and architectural culture, become more segmented (Kent 1984, 1990). According to the author, societies based on fragmented and differentiated cultures tend to organized segmented areas; in other words, they tend to promote architectural and urban structures functionally discrete.

Hillier and Hanson suggest that the use of space and in particular domestic space, is "a 'sociogram' not of a family but of something much more: of a social system" (Hillier and Hanson 1984). In 1984, Hillier and Hanson published The Social Logic of Space, in which they outlined a syntactic theory for the organization of space in buildings and settlements. They argued that buildings, settlements and cities have particular spatial properties that translate into sociological rules which affect where activities are situated and how people relate to one another. Within this framework, the spatial configuration of a dwelling or a settlement is believed to present a fairly precise map of the economic, social, and ideological relations of its intended inhabitants (Hanson, 1998); in other words as Rapoport suggested, it presents the social manifestation of culture.

3. Space Syntax Methodology

Morphological studies presented through the Social Logic of Space and subsequent research during the last decades, try to clarify the configurational properties of space described in the previous section and their meaning, by mathematical and graphical analysis rather than intuitive explanations through Space Syntax methodology. In the last two decades, with its theoretical background, this approach has found its chance to be implemented in a wide field of research, training and practice.

Space Syntax is an analytical, quantitative and descriptive tool that describes built space and its occupancy, helping us understand how spatial patterns constitute means through which we recognize and construct society and culture. It addresses issues such as: how is built space to be understood as a social artifact, how it functions, how it supports or constrains behavior, how it reproduces social relationships and how it generates social effects.

Space Syntax research attempts to shed light on the aforementioned issues by treating built environments as systems of space, analysing them "configurationally" and trying to reveal their underlying patterns and structures (Hillier and Hanson, 1984). A set of non discursive techniques are utilised to discover how far it is possible to bring to light and subject to rigorous comparative analyses the configurational[*] aspects of space and form in traditional settlements, urban space and buildings, through which culture is transmitted.

According to Hillier, space is a more inherently difficult topic, than physical form for two reasons: first, space is a vacancy rather than a thing so even its bodily nature is not obvious, and cannot be taken for granted in the way that we think we can take objects for granted. Secondly, related spaces cannot be seen all at once but require movement from one to another to experience the whole (Hillier, 1996).

Space syntax research sees cities as specialised forms of spatial engineering which permit a large number of people to live in dense concentrations. Seen as systems of organised space, settlements and cities seem to have deep structures or

[*]What does the term "configuration" tell us? According to Hanson (1998), spatial relations exist where there is any type of link between two spaces. Configuration exists when the relations that exist between two spaces are changed according to how we relate each to a third. Configurational descriptions, therefore, deal with the way in which a system of spaces is related together to form a pattern, rather than the more localized properties of any particular space.

genotypes, which vary with culture. Studies of cities all over the world revealed such differences in spatial organisation which seem to be expressions of what might be called "spatial culture" (Hillier and Hanson 1984; Hillier 1996; Space Syntax Conference Proceedings 1999, 2003, 2005). Furthermore, spatial properties which define cities as cultural types seem to be associated with the social systems of the relevant urban societies. For example, in cities in the Arab world, the spectrum between public and private spaces is often quite different from that in European cities. In historic European cities, local areas are for the most part easily accessible to strangers whereas in many Arab cities strangers tend to be guided to certain public areas in the town and access to local areas is much more forbidding.

To understand and experience the man-made environment, whether buildings or settlements, their spatial elements and their relational or configurational properties must therefore be clarified. The basic strategy of configurational analysis is to search for invariants in the spatial pattern and then to consider the relation of labels to spaces. To the extent that space is systematically and consistently patterned across a sample of houses or settlements, these embody in their configuration the social intentions of their makers. When differences are strongly and consistently replicated then we can infer that the structural relations which are articulated are culturally significant. Even within a single building, sharp differentiations in spatial configuration give clues to social interpretation and may reveal the dynamics that underpin everyday life which are independent of people's perceptions of the meaning of space.

Through the study of a number of settlements (currently existing or not) one may be able to observe as Rapoport also suggests, similar social and spatial "ingredients": the streets, the squares, public buildings and houses. However, mere visual inspection and comparison of broad geometric and locational aspects, cannot on their own help us to ascertain how the urban form of a society differs or is similar to urban forms of another society, or to suggest what the dimensions of variability within each society might be.

We could broadly suggest that although all cases are made of the same spatial "ingredients", it is the way these are configured that elucidates culture, ethnic and/or social identity. Closer investigation, utilising syntactic analysis based on Space Syntax methods in a large number of studies during the past decades, does shed light on these issues and demonstrates that spatial differences between societies are indeed associated with their cultural differences but also with their differences in terms of the form of their social solidarity.

In a "space syntax" study of traditional Cypriot settlements, Hadjinicolaou suggested that there were more differences than similarities (Hadjinicolaou, 1982). The Turkish Cypriot public space was shown to be composed of irregular parts which varied in size and shape. The purely Turkish Cypriot villages were also shown to be more "shallow" and easily accessible from the outside than the Greek Cypriot, where the entrances to the settlements were narrow and the approach to the interior more "complicated". Hadjinicolaou argued that these spatial differences derived from cultural differences between the two communities, especially the different forms of their "social solidarity". According to this study, the Turkish Cypriot community achieved coherence as a group by sharing a common ideology, a set of common beliefs similar among all members, whereas in the Greek Cypriot community the activities of its members were more personal, in which achieving coherence as a group was based on the differences between the individuals. The former presented a more "transpatial" form of social solidarity, closer to what Durkheim has called a "mechanical" type, while the latter formed a society for which space was more important in maintaining its coherence, presenting a form of social solidarity closer to what Durkheim has called "organic.

In a syntactic study of traditional local (houses) and global* (settlements) space organisation of 14 Cypriot settlements and 184 traditional houses, Charalambous suggested that the cultural investment in space, both locally and globally, varied to a considerable degree between as well as within each ethnic group (Charalambous, 1992). Based on extensive analysis, the author suggested that although the two ethnic groups in traditional settlements are made of the same spatial and social "ingredients", their spatial configuration brings about strong differences in ethnic identity. It has also been suggested that ethnic differentiation alone cannot explain the variety of forms presented within as well as between the two groups. Using both the form of the local spatial organisation at the domestic level and its relation to the global level, the analysis suggested that spatial differentiation was also associated with the occupational class and status of different social groups within the villages. A more complex picture emerges which has both differences within each ethnic grouping as well as tendencies which cut across ethnic divisions, but which relate together people of a similar status or social position.

A syntactic analysis of the historical core of Nicosia as seen in fig. 1, also revealed important spatial and social information (Charalambous, 2005). The north east quarter is a historic Turkish area, the south east a historic Greek area. The differences in the texture of the grid are marked, with the two areas having a quite different geometries and different emergent topologies: the Greek area has longer lines, more lines passing through each other, a different pattern of angle of incidence and as a result much more local and global integration (and a better relation between the two) than the Turkish area. Since these differences reflect typical differences found between systems in Europe and the Islamic world, it is reasonable to regard these as socio-cultural differences in the basic geometry of space.

As we can see through the axial map, the most integrated* spaces in Ottoman Nicosia (bold lines) are around the central

* The analytic tool used to describe the organisation of public space in this paper, is the "one-dimensional" or axial organisation: this refers to the global organisation of the system from the point of view of those who move in to and through the system; that is, in terms of its lines of access and sight. It can be described by drawing the fewest and longest straight lines which pass through all the convex spaces of the settlement. Because visitors in a settlement, or in part of a settlement, are likely to be moving through the space, the axial extension of the public space accesses strangers to the system, whereas inhabitants have more static relations to the various parts of the local system (Hillier 1996).

* Integrated areas or lines refer to spaces which following a computer spatial analysis exhibit high integration values. In simple terms high integration refers to areas which are easily accessible to a visitor of the city and well connected to the rest of the spaces.

area and cover the market system. The "integrated core"* of Nicosia covers mainly the public areas and does not penetrate into the residential areas. The majority of the public buildings associated with the main functions of the city (administrative and religious centres, services for the visitors etc.) are located in an area easily accessible by the visitors of the city. On the other hand, the religious centre of the Greeks is located in a globally segregated† area (light grey lines); that is, an area which is not easily accessible by a visitor when he/she enters the city. The segregated areas of the city are located mainly in the east half.

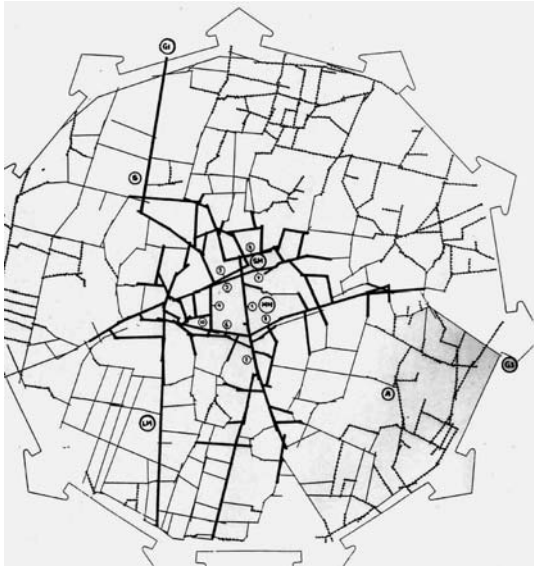

Figure 1. The City of Nicosia during the Ottoman period - Axial Map (based on map by Kitchener 1885)

A striking observation when we study the axial map of Nicosia today in fig. 2, is that the city within the walls becomes strongly isolated from the newly expanded city outside the historic core. The most "integrated" lines of the system are shown in bold and represent the most easily accessible areas by a visitor. The areas around these lines are no longer the old market areas of the walled city but a newly developed market starting outwards from the walls.

Administrative and government buildings also move outside the walled city and are located on strong and integrated axial lines along the same direction. The public buildings of the Greek Cypriot community are now located on integrated and easily accessible areas as opposed to the period during the Ottoman conquest. Residential areas of the Greek Cypriots move to the periphery of the new town of Nicosia and are in general segregated and not as easily accessible from the rest of the city.

* The integration core of a city includes the most integrated areas at a local level. Segregated areas or lines refer to spaces which following a computer spatial analysis exhibit low integration values. In simple terms low integration refers to areas which are not easily accessible to a visitor of the city and are segregated from the rest of the spaces in the city.

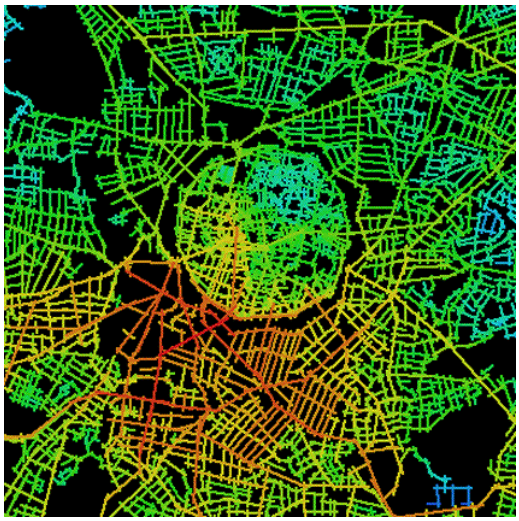

Figure 2. The City of Nicosia today - Axial Map

Similarly, syntactic studies of samples of traditional and vernacular houses have been continuing over the years and an extensive database has now accumulated on the morphology of houses worldwide. Using a quantitative and statistical approach, studies of traditional environments search for regularities in a body of house plans that already exist in the historical record, in order to identify the way the houses are configured and to pinpoint the spatial characteristics of the locations of different household activities. This line of research is closely related to the studies of vernacular and regional house types which have been conducted over the years, but it brings a new analytic dimension to their more conventional forms of historical scholarship.

Orhun's work for example, draws on a previously published first-hand survey and typological account of the traditional turkish house by an architectural historian, Eldem. Many of the houses which Eldem studied, have been demolished; it was no longer possible for Orhun to use direct observation or interviews with the occupants to explore their everyday living arrangements. Traditional dwellings and ways of life everywhere are under great pressure to adopt a modern, largely western lifestyle and it is probably inevitable that the 'genetic pool' of domestic-space types will be seriously depleted by the start of the new millennium (Hanson, 1998). It is therefore vital that those detailed field studies, which are recording this vanishing heritage, proceed in parallel with comparative and cross-cultural approaches, which enhance our understandings of the richness and diversity of people's homes.

Orhun studied thoroughly sixteen examples, selected to cover the range of typical Turkish plan-types, through a detailed configurational analysis. It has emerged that the relationship of the house to the exterior is an important spatial variable, which enabled two configurationally distinct house-types to be identified: an 'introverted' type centered on the 'sofa' and a more 'extroverted' house oriented towards the paved yard. These two types suggests the author, support two different living patterns among inhabitants and distinct ways of receiving guests into the home. Even more important, the findings seem to relate to relative insularity or openness of different sectors in Turkish society to outside influences, and to this extent, the house may be an important index of the progressive or conservative attitudes of its inhabitants.

A heterogeneous collection of forty-seven seventeenth-century yeoman farmhouses from the Banbury region of Oxfordshire is analyzed, to see if any consistencies can be detected in the room arrangements, or in the way in which uses are assigned to different parts of the domestic interior. Configurational analysis of the plans uncovers three distinct forms of domestic space arrangement, the 'thought-passage plan', the 'single-entry plan' and the 'multiple-entry plan', which predominant sequentially up to around 1640, between about 1640 and 1660, and from about 1660 onwards. These seem to be related to the types of family structure, which were prevalent during the period, the 'open lineage family', the 'restricted patriarchal nuclear family'. A fourth type based on a sequence, which occurred mainly during the closing decades of the seventeenth century ant throughout the eighteenth century, seems to have been associated with impoverished house-holds in a region where the differences between rich and poor were becoming increasingly differentiated with the passage of time.

5. Conclusion

Based on a large number of similar studies as the ones described above, it seems logical that spatial configuration becomes an important means of determining how culture is conveyed through architecture. This paper therefore strongly believes that a reconsideration of the current methods of traditional settlements' analysis is required by incorporating Space Syntax methods of analysis in the process. The implications of current methods of traditional settlements' analysis are questioned and a new methodology which combines both quantitative and qualitative methods of analysis based on Space Syntax methods, is suggested. The paper argues that the proposed analysis and presentation of traditional sociospatial organisation will reveal new historical information which takes into consideration both humanistic and technical issues.

One may wonder whether architecture is simply reduced to pure mathematical statements or numerical formulas. We should note at this point that mathematical formulas or numbers alone cannot define or describe spatial models. However, it is clear through substantial research that there are some tendencies and rules in the organization of spaces created by cultural properties. The paper suggests that space syntax can be used as a powerful tool in identifying these underlying rules. A substantial knowledge base is then additionally required in order to interpret the built environment under study and to attribute social meaning to syntactic data. Space syntax methods need to be supported with background knowledge comprising the social, cultural and physical characteristics of the environment under study.

The potential growth of knowledge relevant to a variety of disciplines seems enormous. The understanding of such relationships and the development of reliable, predictive models will aid us in our understanding not only of past uses of space and built environments, but of those of the present and future as well.

References:

Champion, Eric (2005). *Information Environment*; Speech at University of Queensland

Charalambous N. (1992). *Contested Identities: Spatial Forms of Ethnic Co – Existence in the Eastern Mediterranean: the Case of Cyprus.* Unpublished MSc Thesis, University College London.

Charalambous N. and Peristianis N. (2002) "*Cypriot Boundaries*" in Traditional Dwellings and Settlements Working Paper Series, Vol. 159; IASTE, Berkeley, University of California.

Charalambous N. (2004) "*Spatial patterns of ethnic identity in a post global world*" in Traditional Dwellings and Settlements Working Paper Series, Vol. 173, IASTE, Berkeley, University of California

Charalambous N. (2005). "*Nicosia: a multiethnic city?"* in the proceedings of the 49th World Congress of the International Federation for Housing and Planning October 2005: Urban Futures Continuities and Discontinuities

Durkheim, E (1964) The Division of Labour in Society; New York: the Free Press.

Eldem S.H. (1994) Turk Evi; Instabul: TAC Vakfi Guzel Sanatlar Matbaasi.

Hadjinicolaou, E. (1981). *Ethnicity and space*: *Syntactic Analysis of Thirteen Cypriot Villages*, Unpublished MSc thesis, University College London

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

Hanson, J. And Hillier, B. (1982). *Two Contemporary Space Codes Compared, Architecture and Behavior 2*

Hanson, J. And Hillier, B. (1979). *Tradition and Change in the English House: a Comparative Approach to the analysis of small house plants*, London: Unit for Architectural Studies, University College London

Hillier, B. and Hanson, J. (1984). *The Social Logic of Space*, Cambridge University Press.

Hillier, B. et al (1984). *Ideas are in things*. London: Unit for Architectural Studies, University College London.

Hillier,B 1996 Space is the Machine, Cambridge University Press

Jiri Zara, Pavel Slavik, (2003), *Cultural Heritage Presentation in Virtual Environment: Czech Experience.* Proceeding of the Fourteenth International workshop on Database and expert Systems Applications. Prague. IEEE Computer Society Press, 2003, p.92-96. ISBN 0-7695-1993-8

Kent, Susan (1984), *Analyzing activity areas: An ethnological study of the use of space*; University of New Mexico Press

Kent, Susan (1990), *Domestic Architecture and the use of space: An Interdisciplinary Cross-Cultural Study* (New Directions in Archaeology), Cambridge: Cambridge University Press

McCormick, Defant T.A., Brown M.D., (1987). "Visualisation in Scientific Computing" in Computer Graphics 21 (6) pp 1-14.

Norman, Sally (1998) *Cultural and the new media technologies*, Intergovernmental Cultural Conference, Stockholm

Orhun, D, Hillier, B and Hanson J(1995) "Spatial Types in Traditional Turkish Houses" in Environment and Planning B: Planning and Design 22, pp 475-98

Rapoport, Amos (1969), *House, Form and Culture*, Prentice Hall

Rapoport, Amos (1986ª). Culture and built form – a reconsideration. In *Architecture in cultural change (essays in built form and culture research)*, edited by D. G. Saile, pp. 157-175. Lawrence: University of Kansas.

Space Syntax International Symposia Conference Proceedings (1999, 2003, 2005)