Ethical and Methodological Issues in Data Sharing Between Two Research Projects

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Route Map

- In the next fifteen minutes I shall:
  - Set the context for our joint research project into the relationship between care home layouts and QoL;
  - Briefly introduce the 'space syntax' tool for analysing building layouts, that has been developed at UCL over the past 30 years;
  - Illustrate how space syntax is used to retrieve social information from plans, using hospital wards as an example;
  - Explain how the method was adapted to investigate a sample of care home layouts, gathered by Sheffield as part of an earlier project (reported at previous BSG conferences) on the relationship between architectural design and the QoL of residents / morale of staff;
  - Describe the principal findings from this study;
  - Sketch out some of the ethical and methodological issues that were raised by the sharing of data on the project.

Background to the Study

- EPSRC EQUAL funding allowed UCL to analyse the plans of an existing database of 38/36 care homes that had already been gathered by the University of Sheffield:
  - Sheffield's study had already shown that aspects of the design such as the location of the home, its orientation and positioning within the site, and the detailed design of internal circulation routes, residents' lounges and private rooms impacted on the QoL of residents and morale of staff;
  - Did the overall built form / building footprint (shape) and the general accessibility afforded by the internal layout of the building have any impact (as architects believe that they should) on the QoL of residents or staff morale?
  - Simple idea, to take Sheffield's existing data, add an analysis of the whole building, come up with some candidate measures and re-run Sheffield's multi-level regression analysis, to see if our measures were related in any way to the residents' QoL measures and staff morale scores for each building.

What is Space Syntax?

Why did we think this was worth doing:

- 'Space syntax' was originally developed as a tool to represent, describe and quantify key properties of the layout of buildings (and places) in ways that retrieve their embodied social functions directly from the plans;

- We can show what it is about the way a building or place is designed that makes it lively or quiet, easy to navigate or labyrinthine and how organisations can take advantage of spatial layout to support the programme of work that they do;

- The substrate for analysis – the plan - is the same as for architectural design. Design intuitions therefore translate naturally into analytic insights, and the findings from research can inform design proposals at the drawing board;

- At the start of the project, we were less sure about whether syntax could shed light on buildings with such a strong organisational programme / regime as care homes.

Hospital Wards

- Illustrate the method by reference to a recent study by SSL of hospital wards, as (unlike care homes) these are quite small in scale and have relatively simple layouts:
  - This study set out to investigate the internal spatial layout of different types of hospital ward, in terms of the way the beds were organised and grouped and related to the nurses' bases and the general pattern of circulation within the ward.
- SSL were particularly interested in understanding:
  - The effects of different types of layout on the pattern of accessibility and spatial integration of the patients' beds;
  - The effect of locating the nurses' base in a more or less strategic position from where they could see the patients' beds;
  - Whether the design of the ward had any relationship to observed patterns of movement and co-presence, including the amount and duration of interaction among patients, between patients and staff and within the various staff on the ward.

How Space Syntax Works

This is what happens on a typical space syntax study:

- Sample of 12 wards, 3 different ward layouts, the old-fashioned open Nightingale ward, wards subdivided into multi-bedded bays and wards made up of single rooms;

- Carried out a computer generated spatial analysis of the layout of each ward, coloured up so that red = most integrated, through the rainbow spectrum to blue = most segregated. Colours represent a purely mathematical, spatial measure of the relative accessibility of the different parts of each ward;

- Made on site observations, taking 10 minute snapshots of all the activity on each ward on an hourly basis from early morning to late at night, according to the type of user (doctor, nurse, patient, visitor etc.) and what people were actually doing. Observers also traced the routes taken by all the nurses on each ward over 4 x 5 minute sampling periods each hour.

- Correlate spatial measures of access/ integration with the directly observed patterns of use on each of the 12 wards.
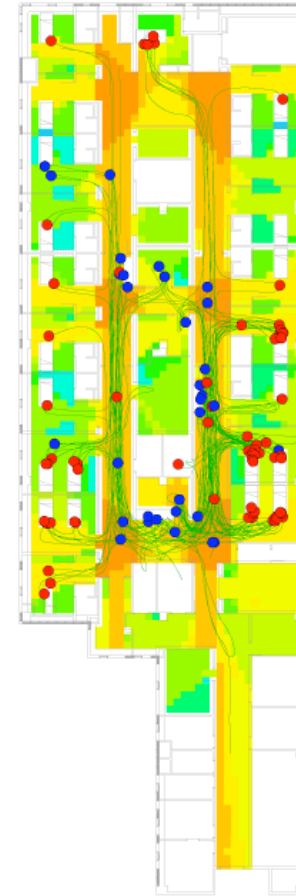
Snapshots of Hospital Wards
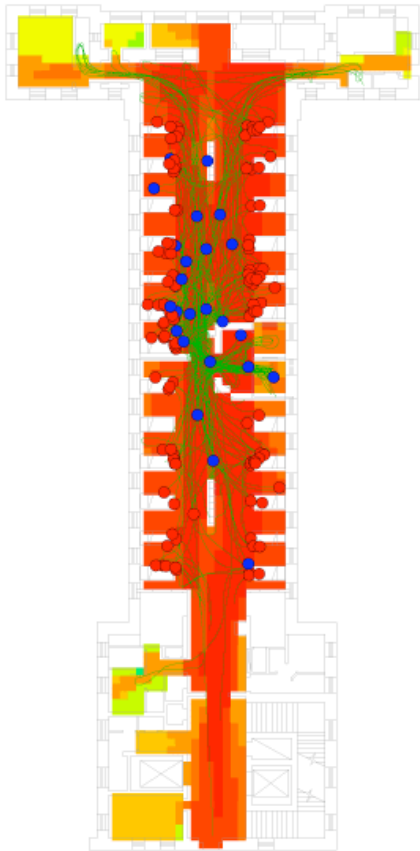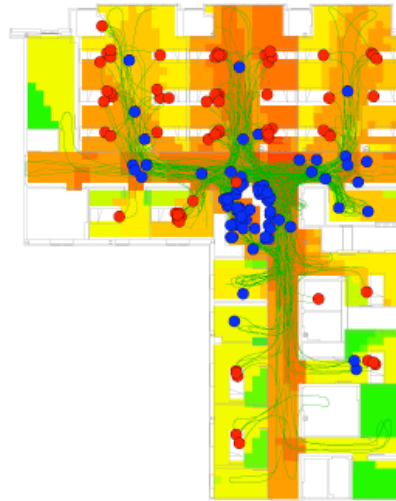
Nightingale   Multi-bed bays   Single rooms

Findings

- Interaction among patients was low, and did not seem to be affected by spatial factors such as the type of ward they were on, or their spatial proximity to one another. Spatial integration did not necessarily result in social interaction, suggesting that interaction is a complex mix of opportunity, patient's personality and their capacity to initiate conversation;
- Contrary to expectations, nurse-patient interaction was in an <u>inverse</u> relationship to integration. Patients in more integrated (red) areas actually interacted less with nurses than those in more segregated (green / blue) areas, especially if their beds were also located in more remote positions on the ward with respect to the nurses' base;
- What seems to have been happening is that in well integrated areas, supervision happened in an informal way which did not involve conversation, but in more segregated parts of the ward nurses had to make a specific journey to see patients, at the end of which, interaction was more likely to take place.
- Do these types of findings have any relevance for care homes?

Adapting Syntax for Care Homes

- There were several aspects that made this study unique:
  - Normally UCL couples building / plan analysis with empirical observations of the building in use. Unfortunately, this was not possible in the care homes study, due to problems in obtaining access after Sheffield's original project had ended;
  - Normally, we look at the relationship between the pattern of accessibility in the building - that is, which spaces are more integrated and are more segregated - in relation to the types of activity that each supports and how people use the various parts of the building for moving through and engaging in static activities. In this case we needed to come up with a set of single, holistic measures for each building to compare with Sheffield's building's scores for the various QoL and morale;
  - Both parties were working 'blind'- that is UCL did not know which homes had performed well on Sheffield's QoL scores and Sheffield did not know which of UCL's candidate measures were expected to give the best results. Fortuitous

Plan Typology

Global Form of the Buildings

|	Small	Medium	Large	Totals
Simple Linear	0	3	1	4
L-shape	3	1	4	8
T-shape	0	2	1	3
Cruciform	0	1	0	1
U-shape	0	1	1	2
Atrium/courtyard	1	2	1	4
Hybrid	0	3	4	7
Compact Villa	5	1	1	7
Totals	**9**	**14**	**13**	**36**

- The 36 care homes were of a wide variety of plan types. The footprint and overall patterns of circulation were very different from one another, which suggested that the buildings should be experienced differently - but would UCL be able to pick this up numerically and would any differences found be related to QoL?

Examples of Care Home Layouts

Cruciform

Courtyard

Hybrid
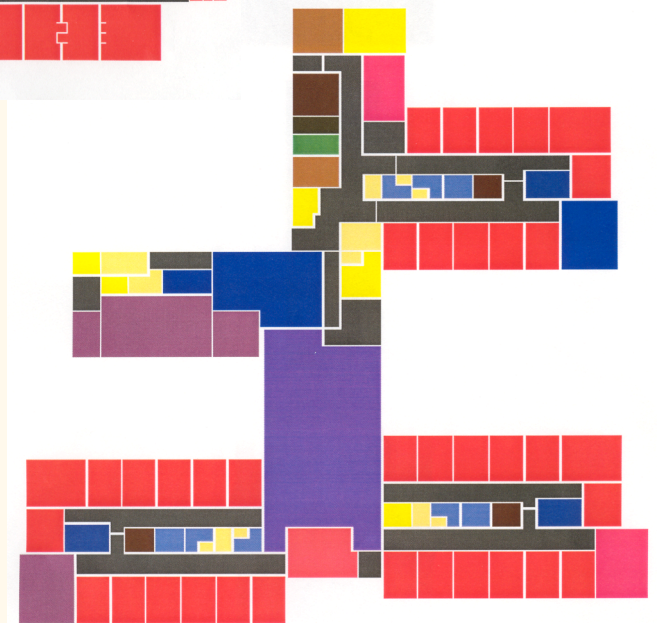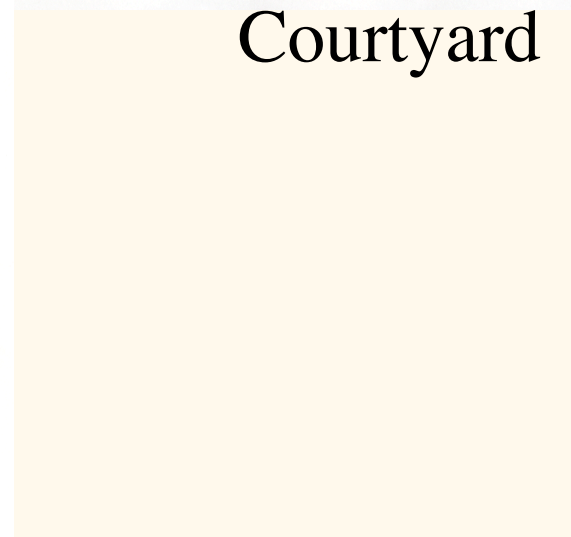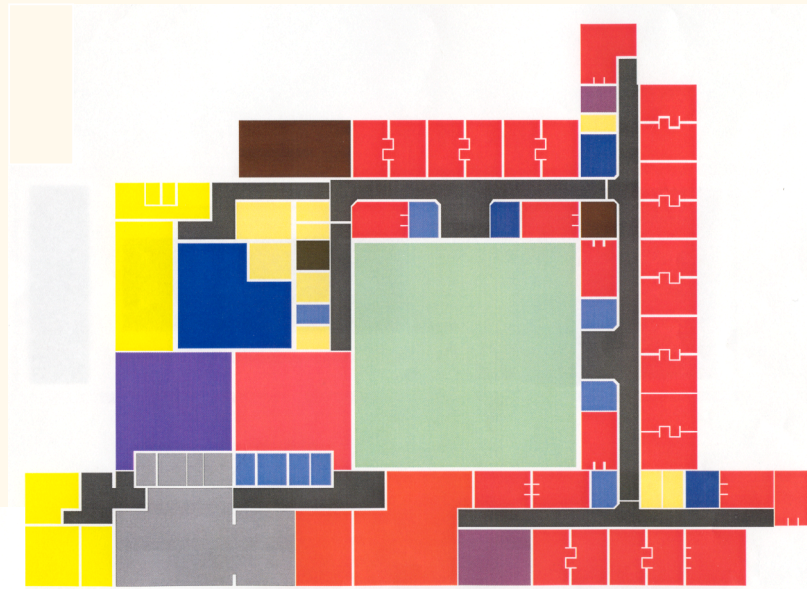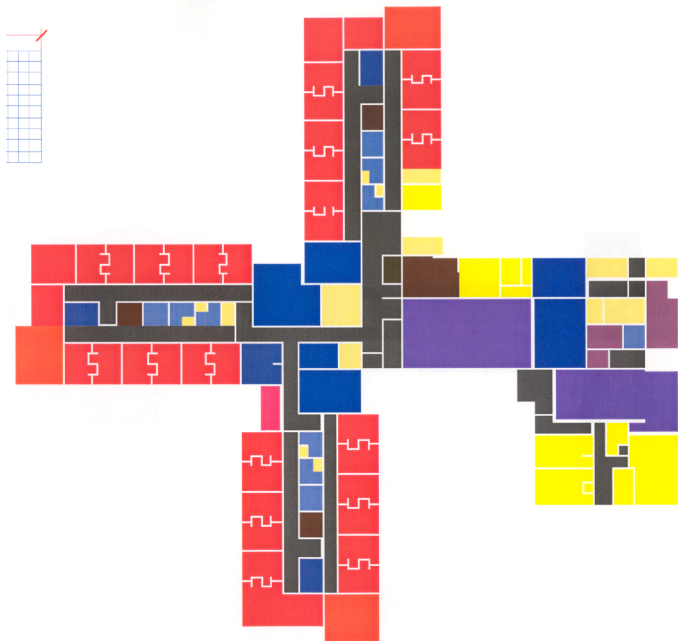
What we Discovered

- UCL came up with 10 candidate measures that looked at different aspects of each building's overall accessibility for Sheffield to interrogate using multi-level regression :

  – None of these correlated with any of Sheffield's original architectural design variables, which suggested that the UCL analysis was contributing a genuinely new dimension to the previous study;

  – The most important turned out to be the mean (average overall) integration of the public realm of the care home, that is the accessibility all the spaces that were available for use by everyone in the home (residents, staff, visitors etc.) including all the corridors, communal lounges and other shared amenities.

  – This is also the variable that is an important predictor of movement and liveliness in external public space and it is a quality architects consciously strive for in a whole range of buildings, including sheltered housing / care homes.

Integration of the Public Realm
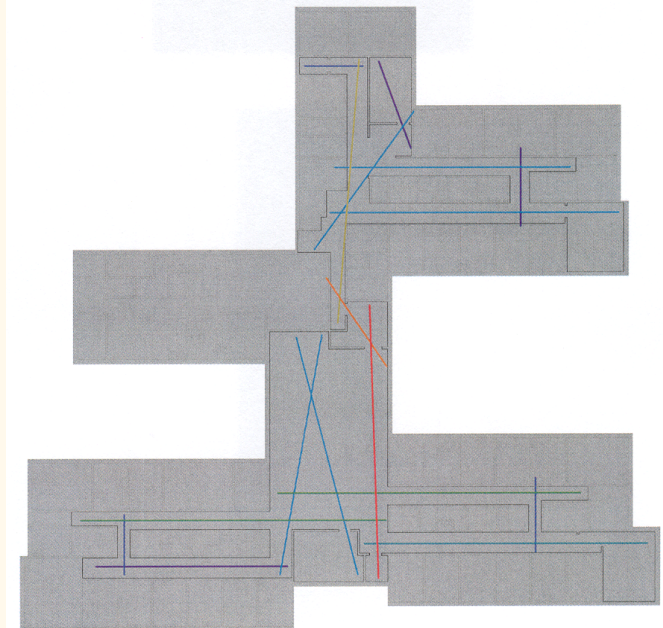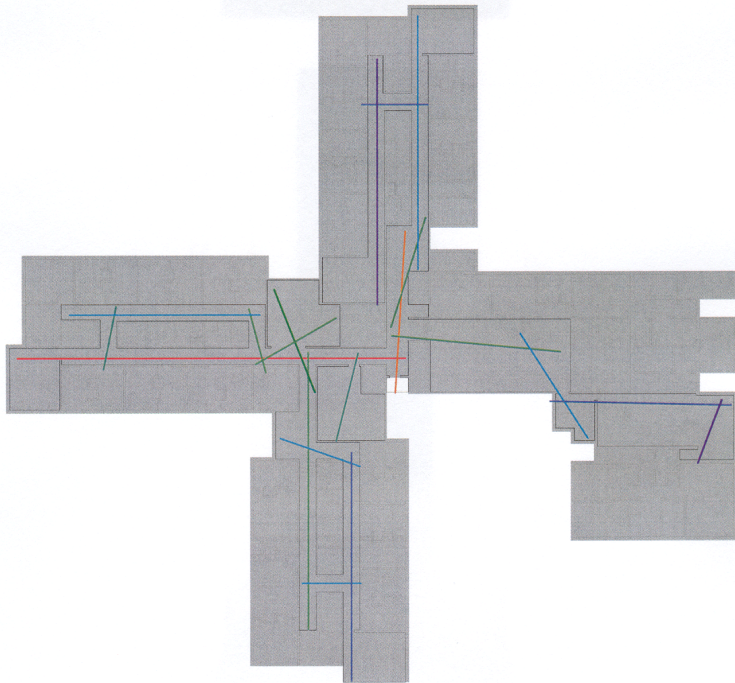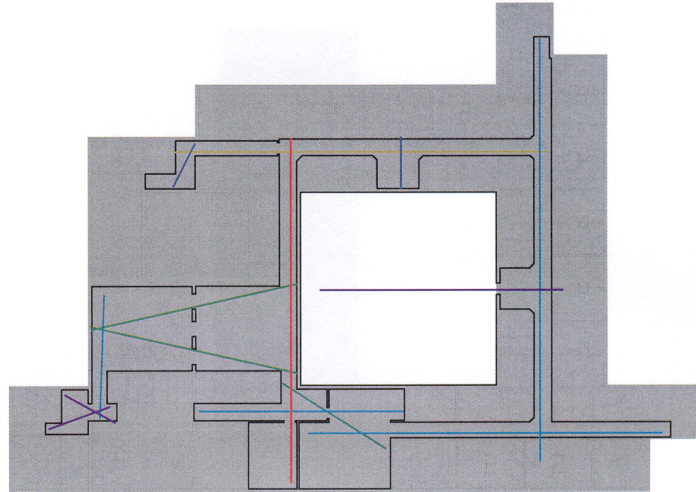
Residents

- Clear, direct and <u>positive</u> relationship between UCL's mean integration measure and three of Sheffield's critical performance variables:
  - the proportion of residents' time active;
  - the frequency of residents' enjoyable activity; and
  - the residents' choice and control over the environment.

- What seems to be happening here is that the overall accessibility of the building, measured by its mean integration, influences whether or not residents find it easy to move about from place to place in the building and to interacting with others, especially the unplanned interaction of 'bumping into' others whilst en-route to a destination, and also the proportion of time 'watching the world go by'. More accessibility = more opportunity to engage in these socialising behaviours.

Staff

- Weaker and <u>negative</u> relation between staff job satisfaction and integration. This is surprising as integration = more efficient trips when moving about the building.
- The result might be related in some way to the negative association between integration and interaction found on the hospital wards study:
  - Maybe staff in the more integrated care homes felt that they were more open to surveillance by residents? Maybe they actually were more open to surveillance?
  - Maybe, like the nurses on more integrated wards, they too had fewer conversations with residents because there were fewer reasons to seek out residents living in more secluded parts of the home?

Unknown Quantities

- These are questions that remain unresolved because UCL did not carry out an observation study of how the various spaces in each of the care homes were being used.

- This illustrates that the two approaches developed by Sheffield and UCL are complementary, and each could benefit by learning from the other.

- SSL's study needed QoL / staff morale data to interpret its findings with respect to integration and interaction. Did more interaction raise or lower patients' QoL / nurses' morale? One would like to think it did, but we can't take this for granted.

- The joint UCL / Sheffield study could have benefitted from an observation study, to determine how the layout of the different plan types created or inhibited the interaction that we know must have differed from setting to setting, as this is to a certain extent reflected in the different QoL / morale scores recorded by the homes. Again we can infer relations but not demonstrate the linkages.

Ethical Dilemmas

- Rather obvious issue of data sharing:
  - We will never know what added value might have been gained had UCL been able to interrogate Sheffield's raw data. Confidentiality v. economy of research effort. Research projects of this kind are very expensive and are unlikely ever to be repeated. Ethical constraints are at odds with the need to build from one project to another. Pressure for this set to increase. Should there be more sophisticated mechanisms to allow for sensitive data to be shared?

- Whose interests should a building serve?
  - Here we have uncovered a situation where a key property of the building layout that appears advantageous to one group (residents) is not experienced so positively by another (staff). Facilities managers in both hospitals and care homes are interested in maximising accessibility for financial reasons (shorter trip distances) and because they are risk averse (surveillance). What about the views of end users? In the event of different perceptions,