KEYNOTE PAPER: WHAT CAN ARCHITECTURAL RESEARCH BRING TO ORGANIZATION THEORY?

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As organisation theory has developed from its foundations in administration and management to incorporate sociological concepts, it has become subject to some of sociology's concerns with method. In particular the separability of people from organisational structures comes into question. Here I review the place of architectural research which studies the effects of the design of the built environment on the behaviour of individuals and organisations. I suggest that as modern organisation theory conceives of the organisation as an emergent phenomenon, the role of the designer as a key actor needs to be incorporated alongside other management roles.

Sociology abounds in problems of method. Many of these result from questioning how it is possible to study systems in which the objects of attention are not only aware and conscious, but may be affected by the fact that they are being studied. This problem is exacerbated by the realisation that they may also be aware of the results of sociological research itself. In this sense sociology is said to be 'doubly hermeneutic' – it depends on at least two layers of interpretation, those by the subjects themselves and those by the researcher. This problem might be considered just to be a fact of the field; it raises questions about ones research tactics, and must always be taken into account (consider the Hawthorn effect), but it does not undermine the programme of sociological research itself. If anything the realisation of the reflexive nature of organisational and individual action serves to highlight the importance of well formulated social theory for those who must intervene in the social world. However, other current methodological debates in sociology call into question just how 'well formulated' social theory actually is.

In a nutshell the debate turns on whether society is formed through the interplay between different 'strata' – social structures such as rule systems or institutional entities for example at one level, and individual people as agents at another - or whether it is all really one thing since ultimately all societies are composed of individual people. In the latter view higher level structures can only arise out of individual actions and reactions, and so the separation of structure from agency in sociological method in fact mistakes the appearance of something for the existence of the thing itself and runs the risk of 'reifying' or treating as real, something which is not. Lurking not far beneath the surface is a fear of Cartesian dualism rearing its head in another guise. Here lies the attraction of two currently fashionable sets of theories, Pierre Bordieu's (1977) notion of the 'habitus' and Anthony Giddens theory of structuration (Giddens, 1984). In both of these structure and agency are held to be part of a single and inseparable whole, the one continually informing the other (although in quite different ways). In this way they avoid both reification and dualism. And yet, these approaches are not without their critics (see Robert Willmott, 1997, for a critique, but see the Introduction to the Second Edition of Giddens, 1993, for his view). They point to the emergent nature of societies as being the fundamental phenomenon to explain, and suggest that in order for systems to show emergence,

feedback mechanisms are necessary, this in turn requires 'strata' to feedback between. Without strata (or some other set of analytically separable entities) how would social emergence and change be accounted for? They say that by conflating structure and agency into a single inseparable thing, not only does it rule out the possibility of accounting for emergence, but it also undermines the possibility of carrying out meaningful social study. What is sociology about if it not to study the interplay of individual agents and emergent social structures such as organisations or institutional systems? Unless one grants such things a real status sociology itself becomes impossible.

Of course to those of a more pragmatic vein much of this sounds like arguing about the numbers of angels that can stand on the head of a pin. What has this got to do with the practicalities of managing organisations or building buildings? My answer is to reverse the question: what can the practice of management, and in particular that of design and construction, bring to the field of sociology and its current methodological debate? Here I think that there is an important contribution to make, and it comes perhaps surprisingly, from the field of architectural research and theory. Organisational change seems invariably to go hand in hand with reallocation of space and often the redesign of the organisations buildings. In fact one of the tools of management in achieving changes to organisational behaviour and culture lies in the exploitation of the spatial environment. It is this relation between social and organisational outcomes and the design of buildings that lies at the heart of architectural research. If a building is designed one way or another what difference does it make for the client and users? Now it has to be said that architectural theory lags behind architectural practice in this area. This is not surprising if one considers that people first started building complex buildings in at least 10,000 BC, whilst it was not until the renaissance that any significant architectural theory was set down. However, in the last few years this has been changing. With the development of computing it has become possible to represent and analyse the large and complex patterns of space that buildings make, and this has allowed systematic research into the relationship between form and function for the first time.

This research holds that apart from the obvious 'reality' of the agent in social phenomena, there is another obvious and independent 'real' structure at play. This is the structure of the built environment, a factor which is almost completely missing from current sociological thought, but which I believe has a significant impact on the sociologists methodological debate. If there are two undeniably 'real' strata at play, then feedback and emergence are possible. By injecting the spatial structure of the built environment into the mix it seems possible in principle to cut the sociologists' Gordian knot in the 'structure agency' debate. I am going to argue that debates of this sort matter in that if we get the theory wrong we end up with serious failures when we intervene in the world.

This recasting of the problem allows us to integrate a number of strands of post-modern thinking formally into the broader church of organisation theory. Considering an organisation in terms of the way that it is experienced by its members has always been hard to integrate with formal organisational analysis. Conceiving of the agent as embodied and embedded, and of many of our behaviours as being learned and tacit rather than conscious and explicit, is at odds with thinking about formal organisational structures considered either as sets of related tasks, roles, responsibilities and reporting lines, or as sets of resources and rules on their use, since each of these is based ultimately on an assumption of the 'rational individual' optimising for utility.

Conversely, the concept of 'culture' although clearly crucial in the operations of organisations, has been very hard to pin down in any researchable way. Now both of these benefit through the inclusion of the environment within which agents are embedded as a formal and independent component of the system under study.

Let me give a simple example by way of explanation[1]. Figure 1. shows the plan of a small doctor's surgery. Although it is only a simple building, it captures some very basic aspects of medical practice considered in terms of social interfaces. The plan can be seen to be constructed of four rectangular and one circular rooms, the spaces between these rooms and the surrounding exterior space. Each of the rooms can be considered as both a formal 'block' from the outside and as an interior space containing a specific social function: two are doctor's consulting rooms, one a treatment room, one houses the reception and records, and the circular block contains toilets. The blocks are constructed of fair faced brickwork, a material familiar on building exteriors. The space defined by the placement of the formal blocks in relation to each other is more complex both in shape and in its function. The main area of this space is used as a patient waiting area, however, its shape is not easily described since we have no words for anything other than the simplest and most regular of spatial morphologies. The best that can be done is to describe the experience of moving through or inhabiting it.
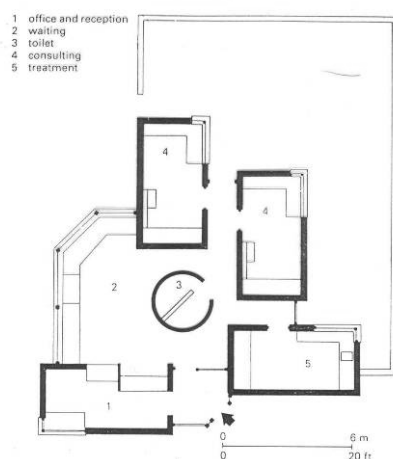

Figure 1: General practitioner's surgery in Buckinghamshire by Aldington, Craig and Collinge.

The entrance to this space is through a glazed lobby formed between two of the rectangular blocks: the treatment room and reception. These two are staggered in echelon, and the external and internal doors from the lobby define a diagonal route between the blocks directing the visitor towards the waiting area. The reception block has a window overlooking the front exterior area, a door opening onto the entrance lobby itself, and a reception counter opening onto the waiting area. The visitor is therefore directed past the reception counter towards the waiting area. The waiting area itself is contained by a glazed external wall with benched seating facing back towards the entrance and reception counter, by parts of the fair faced brick exterior of the formal blocks and by occluded but open space 'around corners'. The circular toilet block is carefully aligned so that it substantially blocks the view from the waiting area

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[1] This is an example that I have given before in a task modelling context – for a more complete treatment see Penn, A. (2005) *The system-user paradox: Do we need models or should we grow ecologies?*, Proceedings of *TAMODIA'05*, September 26–27, 2005, Gdansk, Poland, ACM 1-59593-220-8/00/0000

of the two stub corridors leading to the consulting and treatment rooms, hiding their doorways, and defining a circulation corridor giving access to all five blocks without passing through the waiting area. Although glimpses of movement along this route will be given to those in the waiting area, the doctors can move between the two consulting rooms completely unseen.

The description I have given here is of a series of the material, formal and spatial properties of the building, however, it is clear that whilst the material and formal properties are relatively easily conveyed through language, the spatial properties require both a description in terms of what it is like to 'be there' and continual reference to the illustration in order to be understood. This is not just chance. The point is that the construction of space is essentially relational, where any 'move' takes on meaning only in relation to all others. It is the relation between four similar rectangles and a circle that creates the complex contained space of the waiting and circulation area. However, it is the experience we get as we occupy and move through this space that informs us of the nature of the organisation. The status of the doctor's role is supported by the relative isolation of the consulting rooms and the way in which the doors to these are hidden. The controlling role of the receptionist is built into their location and its visual fields. The processing of the patient through the system is built into the relatively complex pattern of space they occupy – which itself is formally 'space left over' through the subtraction of the more formal and geometric staff spaces. The different nature of these locations can be measured by transforming the pattern of space into a graph or network. Figure 2. shows a set of graphs laid out 'up the page' in terms of steps of depth as one moves from space to space in the building from different 'root' spaces. This shows how from different points of view the same (fixed/concrete) building is objectively different in terms of spatial relations.
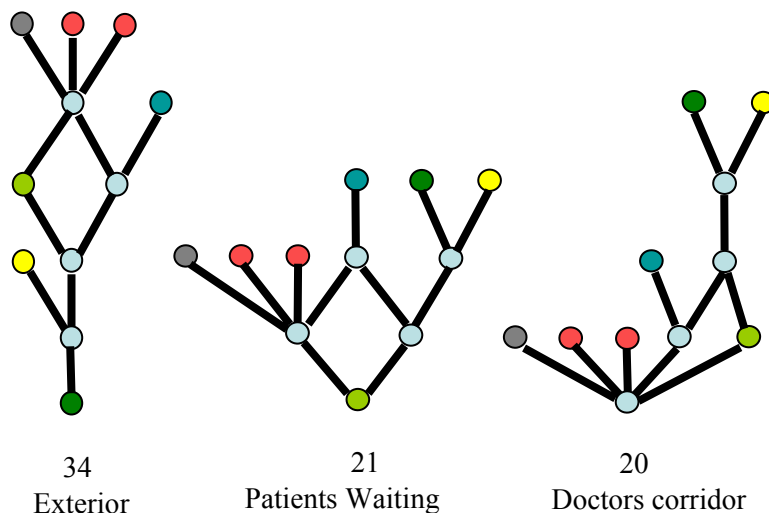

34	21	20
Exterior	Patients Waiting	Doctors corridor

Figure 2: Depth graphs from three different locations in the surgery and the total depth of the rest of the building from that point of view.

This is one way in which the 'social stuff' of organisations is captured in the structures we build, and perhaps one way that those who work in buildings or use them retrieve information about the structure of the organisation. Graphs of this sort are mathematical objects and so can be measured, and become open to comparison and study. This gives us a methodological framework to set alongside more conventional methods of sociology and organisation theory in trying to understand the nature of organisations and their evolution. However, if we are to argue that the built

environment is to act as a 'stratum' through which feedback will afford emergence we must, to use the sociologist's jargon, demonstrate that its has 'causal bite'. In other words we must show that it not only 'means something' to people, but that it 'matters'. Here I refer to research that shows how one independent effect of built form is to structure the patterns of movement of people around buildings, and in doing so to define patterns of co-presence of people in space (Penn *et al.* 1999). Using ethnographic observation methods the effects of spatial design on user behaviour and occupancy can be clearly illustrated. By using methods derived from social network analysis it is also possible to see how these patterns of co-presence then turn into patterns of 'who finds who useful in their work'. Here is some causal bite – what we have found is that the structure of space in buildings accounts for a significant component in the degree to which the human resources of the organisation value each other. I would suggest that here lie the bones of an account of some of those intangibles which often get labelled as 'organisational culture'.

CONCLUSIONS

The doctor's surgery illustrated in Figure 1, small though it is, is a highly crafted object. It gives a rather elegant exposition of what I consider to be the difference between 'architecture' and 'building', if we take architecture to be a reflective practice (Schön, 1983; 1987) in which multiple layers of meaning are integrated with an economy of means. Whilst vernacular building uses all the same media and techniques to achieve social effect, it does so through a long history of learned practice and tradition. Architecture's role however, is to innovate through conscious intent and knowledge of the domain. Now here the nature of architectural design as a practice must be considered, for although I would agree with Donald Schön that design as an individual activity is to a large extent reflective and tacit, most of design practice is anything but individual; it is the subject of highly contested social negotiation at many levels. Here the role of design is to mediate between the multiple and often conflicting constraints imposed by different actors and agencies and the opportunities afforded by site, space, material and technology to resolve these.

It is here that design as practice is central to innovation, but it is also here that risks lie. If the explicit knowledge that informs design is objectively wrong – if we use poor theories – then we end up with building failures. Consider for example the effects of the theory of the territorial nature of human settlement on the form of postwar social housing. Since the theory that informed design was wrong social failure ensued and the only solution has been radical surgery or demolition. Of course from a theorist's point of view this just gives useful evidence for my argument that spatial structure can have objective social outcomes, however from a practitioner's perspective it gives pause for thought, while for users it can wreck lives. What does this imply for the way that modern organisations should work? Here I draw on Giddens' proposition that what differentiates modern society from those of the past is its reflexive nature; social institutions and individuals are aware of the social world and act in that knowledge. The architects of the 1960s had their hearts in the right places, and worked with the best theories of the time. They consciously and reflexively took account of the nature of society as they understood it and aimed to make it better. It was this reflexive process that was at the root of their modernism, but it was the poverty of the social theories themselves that led to failure, and in particular the poverty of those theories with regard to the role of the spatial stratum of society.

The problem here is that there is no going back – all that can now be done is to work with organisations that are reflexive and aware, in the knowledge of the risks this carries. It means that we must manage those risks, and this means internalising and building knowledge within organisations about the spatial stratum of society. This is the kind of knowledge that Bill Hillier calls "specifically architectural" (Hillier, 1993). Here I propose that we must bring those with knowledge of design and the way it affects social outcomes directly into organisational management structures. The design and management of space sits alongside finance and human resources at the heart of decision making in the modern organisation. In other words, buildings and knowledge about buildings are core to organisational success in the modern era, since the spatial environment is a key tool in managing the emergent properties of organisations such as organisational culture and effectiveness.

What does this mean for construction management as a discipline? If as I have argued 'well formulated' social theory requires an active spatial stratum, this has radical implications not only for theoreticians (sociologists, organisation theorists and the like), but also for those professions that act for clients in the production of the built environment: for the 'implementers' that is. No longer can this function be seen as only about the efficient use of resources in the provision of property assets (although it is also about that). It must now be seen as an active part of the operational management of the organisation itself since the structure of space is itself an intrinsic layer in the structure of the organisation: by building and adapting their environments organisations 'learn' and capture at least part of the social knowledge by which they are defined. This type of learning (if that is what it is) must now be managed and this management is of course a specialist area of expertise in its own right.

We are perhaps seeing this shift in the formation of new professional roles such as the facilities manager, but we are also seeing this in the form of new operational management roles for construction organisations such as those created by PFI. Here, I predict that we will see a shift of emphasis. Design and the management of design by construction firms have tended to focus, quite understandably, on efficient constructability; however, as these firms become increasingly responsible for the management of the 'spatial stratum' of other organisations, a new kind of knowledge will be called for. This is knowledge of the effects of the design of the built environment on the way that organisations function, and the way that property and technology can be managed and tuned to allow clients to respond to increasingly rapid change in their operating environment. Here, I suggest, is one front on which innovation in construction management will take place in coming years.

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