

# BACKDROPS: THE STRUCTURAL DIMENSIONS OF ACTION AT A HOSPITAL

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## Abstract

*This paper undertakes the description and analysis of cooperative work settings on a hospital's surgical ward and renders a notion of 'backdrops'. The rendering of backdrops facilitates a description of what could be considered analytically prior to human action rather than a description of human action per se. That is, accounts of backdrops for human action could be considered accounts of what enables and constrains the actions of human actors.*

*The purpose of such an attempt at conceptual development is twofold, firstly, to contribute to a grasp on work settings through which it may be possible to develop computer support that fit the nature of particular work settings, and secondly to contribute to an understanding of the dynamics between technology and social relations.*

*On the design of information systems, it is suggested to begin to think of it as contributions to the design of technology saturated backdrops for human action. Perhaps accounts of work settings in terms of backdrops could have implications for the way we design information systems.*

*Keywords: Work settings, Sociomaterial, Cooperative Work, Backdrops.*

## 1 INTRODUCTION

Over the last decade or so, context and location have increasingly come into focus in the analysis of computer support for cooperative work because pervasive computing technology has demonstrated the viability of spreading computing power from static hardware into artifacts and places, both at the workplace and beyond. Two factors have contributed to this; the increasing flexibility and computing power of smaller scale devices, and the wireless networking capabilities and structured exchange of information (Andersen & Brynskov, 2006). In this world of location tracking, sensors and software agents, we need concepts to grasp the link between social relations and technological infrastructure.

This paper undertakes the rendering of a notion of ‘backdrops’ for human action, seen in relation to cooperative work settings on a small size hospitals surgical ward. The purpose of such an attempt at conceptual development is twofold, firstly, to contribute to a grasp on work settings through which it may be possible to develop computer support that fit the nature of particular work settings, and secondly to contribute to an understanding of the dynamics between technology and social relations. We could suggest that one way of doing this is to attempt to develop analytical concepts like ‘backdrops’. That is, the contribution of this paper is in an attempt to render an analytical concept which can help us describe the dynamics between technology and social relations, and further more, reflect on why, how, and when actors act in accordance with the setting they are in.

Barker (1968) and May & Kristensen (2003) address the problem field in regard to why, how, and when actors act in accordance with the setting they are in. In May & Kristensen (2003) there seem to be an analytical strategy of describing a delimited slice of time and space as a plurality of habitats, including informational habitats and conceptual habitats. May & Kristensen (2003), as far as I can see, run the risk of promoting the idea that information and conceptual schemas are stable phenomena rather than practices or processes. Barker (1968) found that people act in accordance with the setting they are in. Barker (1968) describes how he could “predict some aspects of children’s behavior more adequately from knowledge of the behavior characteristics of the drugstore, arithmetic class, and baseball games they inhabited than from knowledge of the behavior tendencies of the particular children” (Barker, 1968, p.4). However, we could note that according to Heft (2001), Barker limited himself to *describing* patterns of action associated with a particular setting; he did not attempt to explicitly *explain* their advent and reoccurrence.

## 2 BACKDROPS FOR HUMAN ACTION

In the following we shall suggest that backdrops for human action could be described as a mesh of social structure, affordances and material properties. That is, we shall suggest that it could perhaps be fruitful, in a design perspective, to explain patterns of action as taking place against a backdrop that influence their advent and reoccurrence. For analytical purposes we shall disassemble backdrops for human action into three structural dimensions (social, material and affordances) and in turn consider how they influence the advent and reoccurrence of human action in hospital settings. First we shall reflect on how the social dimension influence human action, secondly we shall consider how material properties are fundamental to human action, and thirdly we shall consider how material properties described in terms of affordances contribute to the basis of human action. Finally, we shall briefly consider how backdrops for human action could have their structural elements rearranged during the introduction of new technology.

According to Porpora (1998) social structures could be described as systems of human relations among social positions. Further more, he goes on to argue that systems of human relations are, in an explanatory sense, more fundamental than patterns of action. That is, Porpora emphasize relationships between social positions as a basis for explaining the advent and recurrence of patterns of action (Porpora 1998, p.206).

Following Porpora (1998), we could attempt to explore some of the social structures contributing to the advent and reoccurrence of patterns of action at a physicians x-ray conference. At the conference,

that takes place every morning, both intern- resident- and senior physicians are present and participate in the interpretation and discussion of the patients' x-ray images. However, the senior physicians alone draw the conclusion to any discussions, and the intern- and resident physicians virtually never questions the conclusions of the senior physicians, they hardly ever argue with their judgments. Further more, the senior physicians direct the rhythm of the setting – when to start the conference, when to change subject, when to break up the conference etc. That is, the senior physicians exhibit authority, and the intern- and resident physicians act as subordinates. What is the nature of the social structure that contributes to the generation of these patterns of action?

Part of the answer is obviously that in relation to intern- and resident physicians the senior physicians are more experienced and most likely more knowledgeable. This is properly part of the basis for the patterns of action observed above. However, perhaps it is also fair to point out that in addition to more experience and knowledge the leading senior physicians have certain prerogatives over the career of the intern- and resident physician by virtue of their relative positions of power in the organizational hierarchy. These prerogatives include the ability of the senior physicians to determine the nature of the training, and to some extent the workload of the subordinate physicians. In short the senior physicians could have a marked influence on the career of the intern- and resident physicians. In this sense it is, among others, the relational properties of experience, knowledge and power that shape the behavior patterns observed above. That is, we could suggest that relations between social positions could contribute towards an explanation of patterns of actions. Perhaps it could be fruitful to view patterns of action as partly based on social structure. Following Porpora (1998), social structure understood as systems of human relations between social positions influence patterns of action. In this sense social structure contributes to the formation of backdrops for human action.

Further more, in connection to the nature of the influence of social structure on human action, Archer (2003) emphasizes "it is essential to distinguish between the existence of structural properties and the exercise of their causal powers" (Archer 2003, p.7). According to Archer (2003), the causal powers of social structures are mediated through human action. Following Archer (2003), the causal efficiency of the social structure described above is mediated through human activity, including doing, thinking, deliberating, believing, intending, loving etc. That is, there is no causal necessity between social structure and the advent and reoccurrence of patterns of action. However, it is through their causal powers that social structures establish their reality (Bhaskar 1989).

In connection to the nature of material properties, Bhaskar (1998) argue that first of all material structures unlike social structures (and structures of affordances we shall suggest below) exist independently of the activities they govern. Secondly, they exist independently of the agent's conception of what they are doing. Thirdly, they are universal in the sense that they are space/time invariant (Bhaskar 1998, p.218).

Following Bhaskar (1998), perhaps we could attempt to consider some material properties of the artifacts found in the x-ray conference. The material structures of the x-ray conference consist of natural properties of the environment described interdependently of the actors in place. For example, because the surface of the light boxes is transparent it allows the light, produced by halogen tubes, to escape and illuminate the x-rays placed on the boxes. Obviously it was designed and assembled this way, in order to enable human actors the viewing of x-rays. However, the properties of the materials used cannot be freely 'made up' they are dependent on natural phenomena. In this sense design is partly a question of exploiting the properties of materials. Bhaskar argue, in a different context, that, stones can be picked up and thrown because they are solid; they are not solid because they can be picked up and thrown (Bhaskar 1998). Perhaps we could apply this logic, to the interior to the x-ray conference and the artifacts found there. X-rays placed on the light boxes can be viewed because they are partly transparent, they are not transparent because they can be viewed. In this manner the material properties of the artifacts underlie the advent and reoccurrence of patterns of action.

The notion of material structure described above could be read as an attempt to delimit a measure of autonomy to the natural processes of our non-social environment, while allowing the same natural processes a measure of influence on human action. In short, human action is influenced by the nature

of the material properties of the environment, and in this sense the material properties of the environment contribute to the formation of backdrops for human action.

In regard to exploring the material properties of the environment considered directly in relation to human actors, we could turn to Gibson (1986). Gibson (1986) coined the concept of affordances in order to describe the complementary of the animal (including humans) and the environment: “the affordances of the environment is what it offers to the animal, what it provides or furnishes either for good or for ill” (Gibson 1986, p.127). That is, an affordance points two ways, to the environment and to the perceiver. We could suggest that the difference between material structures and affordances is from an analytical point of view a question of emphasis. Descriptions of affordances emphasize the relationship between human actors and the environment as mentioned above. In contrast, Bhaskar’s (1998) descriptions of material properties are rendered interdependently of the actors in place. Perhaps we could suggest, at our own peril, that material properties could be described as affordances when in relation to human actors.

Following Gibson (1986), we could return and attempt to explore some of the affordances contributing to the advent and reoccurrence of patterns of action at the physicians x-ray conference. We could note that the technological milieu of the conference affords the physicians reviewing of x-ray images. Two backlight boxes are placed against the far wall of the room. The format of the light boxes affords the simultaneous viewing of x-rays in a limited number. The nature of the images shown affords the physicians a range of interpretations. However, not all somatic phenomena on the images are visible to them at the resolution used. In this manner, the affordances described above contribute to the action patterns of the physicians, in the sense that they enable certain actions (reviewing the x-rays) and constrain others (the x-ray images does not reveal all somatic phenomena). Perhaps we could, in the above manner, go on to describe the remainder of the affordances of the x-ray conference room (stools affords sitting on and so on), however perhaps it would suffice to propose that the affordances of a backdrop influence the patterns of action associated with it (people will often choose to sit down if they can). Perhaps it could be fruitful to view patterns of action as partly based on the affordances of the environment. That is, patterns of human action could be explained not only with reference to human relations and the material properties of the environment, but also points towards the affordances of the environment, contributing to the formation of backdrops for human action.

The above rendering of backdrops for human action facilitates a description of what could be considered analytically prior to human action rather than a description of human action per se. Further more, backdrops designate a mesh of social structures, material properties and affordances that influence the advent and reoccurrence of patterns of human action in a bounded location.

Perhaps we could also briefly consider how backdrops of human action are structured in other hospital locations besides the x-ray conference. We could in passing note that locations characterized by safety critical activity, such as an operating theatre, exhibit a clearly rendered social structure, and the actors seem strongly compelled to adhere to his or her social role in a rigid manner, in order to ensure orderly and safe conduct. In contrast, in locations characterized by non-safety critical activity, such as a lunchroom, social structure is rather loosely established, and the actors are not in a similar manner compelled to act in accordance with a sharply rendered social role. That is, the various backdrops of human action exhibit variations in the nature of the rendering of the various structural elements, and these variations are coupled to the nature of the patterns of action unfolding. In this manner, the analysis of backdrops for human action could contribute towards an understanding of possible variations in patterns of action across work settings.

On the design of information systems, we could suggest to begin to think of it as contributions to the design of technology saturated backdrops for human action. Imagine a surgical ward introducing voice recognition software running on mobile personal digital assistants connected to a repository of patient’s journals. Such an addition to an information system could allow physicians to make entries directly into journals vocally, and in the process bypass the corps of secretaries that normally make entries into journals. Such a system could influence the social structure of the ward, changing the relationship between physicians and secretaries. That is, new technology contributes to the recreation of old social roles and the creation new ones. In this manner the design of information systems could

be considered having an influence on the constitution and reconstitution of backdrops for human action.

### 3 CONCLUSION

In an attempt to capture the structural dimension of action at a hospital we have rendered the notion of backdrops. The backdrops for human action described are accounted for in terms of a fit between, on the one hand, systems of human relations among social positions (social structure) and, on the other hand, the material properties of the environment understood, when in relation to human actors, as affordances. Further more, we have suggested that perhaps the notion of backdrops could have implications for the way we perceive the design of technological systems. In the sense that the influence of technology on social structure, and the influence of social structure on the application of technology, could be accounted for explicitly, and such accounts of backdrops for human action could in turn have implications for the way we design.

### 4 ACKNOWLEDGEMENTS

My warmest thanks to the physicians and nurses at the surgical ward. Further more, the comments and opinions of Kjeld Schmidt are gratefully acknowledged as well as the support and comments given by Mette Mathiassen.

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