Preface

This is a book about understanding work for purposes of collaborative systems design. It is especially concerned with ethnomethodologically-informed ethnography as a means of analysing work, and to articulate ways in which such ethnographic studies might be related to design. In a design context, ethnomethodologically-informed ethnography is often simply referred to as ethnography, a convenient abbreviation that will be employed here.*

Ethnography is an approach to social research that is of increasing interest to the designers of collaborative computing systems. Rejecting the use of theoretical frameworks and insisting instead on a rigorously descriptive mode of research, the approach is considered to provide a valuable means of analysing the social circumstances of systems usage, the latter being a factor that an increasing number of designers identify as crucial to successful systems development. The 'turn to the social' in systems design recognizes that computers are employed within situations of human interaction and collaboration and that the work systems need to support is, as such, essentially social in character. Placing unique emphasis upon the observation and description of interaction and collaboration within natural settings, in contrast to within laboratories, ethnography is an approach that brings a real world, real time social perspective on work to bear on systems design. The approach is particularly concerned to identify and convey the ways in which everyday activities of work (workaday activities) are assembled in the interactions and collaborations of parties to their accomplishment. The emphasis placed on the collaborative assembly of work in interaction leads ethnographers to speak of the 'social organization' of work or, more simply, of cooperative work – a distinct focus which underpins ethnography's appeal to and purchase in interactive systems design generally.

*It should be said at the outset to avoid confusion that this convenient abbreviation glosses over a wide variety of different and competing analytic frameworks or formats, a great many of which provide the analyst with an *a priori* ensemble of general theoretical concepts and categories for describing, analysing and representing work. For sound methodological reasons that will be articulated over the unfolding course of this text, such 'generic analytic formats' are rejected as inadequate. When and where the notion of ethnography is employed in this text, it should be read then and taken to refer to ethnomethodologically-informed ethnography and not to the members of that broad family of approaches that employ generic analytic formats to analyse ethnographic materials, unless it is explicitly stated to the contrary.

The purpose of this book is to introduce potential users of ethnography to the study of cooperative work and, for the more familiar, to articulate practical ways in which studies of work may be employed in the design process to analyse the social characteristics of the design space. Accordingly, the book is organized into four discrete yet interrelated chapters, addressing 1) the requirements problem, which provides the motivation and practical context for the inclusion of ethnography in the design process; 2) significant ethnographic practices for describing, analysing and representing cooperative work; 3) the practical relationship between ethnographic studies and design; and 4) the role of ethnography in the evaluation of systems supporting cooperative work. While addressing academic problems in each of these areas, this book is intended to be a pragmatic aid to parties involved in the design of collaborative systems and so the primary emphasis of the text is methodological in character. Methodological issues are elaborated through practical examples which illuminate how cooperative work may be described, analysed, and represented, how work studies may be structured to inform the formulation of design solutions, and how ethnography may be employed in the evaluation process. Examples are drawn from a development case which describes, in turn, the description, analysis and representation of cooperative work in a library setting, the initial formulation of a design solution supporting searching's work, and the elaboration of the initial design solution through end-user evaluation of the developed system.

At a substantive level, the book addresses the adequacy of Human–Computer Interaction (HCI) as a primary point of view for describing, analysing and representing work. It has long been recognized that in concentrating on the cognitive properties of users, the real world, real time work of competent practitioners located together in workaday situations is ignored to the detriment of design. Rather than try to repair the inherent deficiencies of cognitive theory, an alternative primary point of view for analysis is considered instead. Computer Supported Cooperative Work (CSCW) places analytic emphasis on the need to appreciate the collaborative and essentially social character of work in undertaking interactive systems design. Ethnographic approaches in general are considered to be a valuable means of describing and analysing cooperative work, though these approaches are not without their problems. Of particular concern is the 'problem of constructive analysis' that besets a great deal of ethnographic research and sees the real world, real time social organization of work glossed over and obscured through the descriptive, analytic and representational use of generic theoretical formats. Consequently, the development of an informal method of description, analysis and representation inspired by ethnomethodology is considered as an alternative to theoretical formats.

Moving to design, the link between studies of cooperative work and design is explored. Particular emphasis is placed on the role of an

adapted patterns language as a lingua franca supporting communication between ethnographers and designers. The adapted patterns framework provides a means of structuring ethnographic studies to support cooperative analysis of the design space and provides concrete resources informing the co-construction of use-scenarios. Use-scenarios articulate the practical demands that may be placed on systems by users and serve to specify quality criteria which shape the production of design solutions. Design solutions may be further elaborated through the construction of prototypes made available to end-user experimentation. End-user experimentation does not mean that designers must construct laboratory-based scientific experiments to test the validity of their systems, but rather that the validity of the system should be assessed in direct relation to the actual cooperative work of end-users. The final chapter of the book explores techniques of cooperative design and situated evaluation as a means of assessing the validity of proposed design solutions and conducting further analysis of the design space in cooperation with the real experts in work's accomplishment – namely, the people who will actually use proposed systems in their cooperative work.

2

Making Cooperative Work Visible

The need to appreciate the fundamentally social or cooperative nature of work in undertaking collaborative systems design mitigates against a technology-driven approach as a primary point of view for analysis. Technology-driven approaches to analysis, such as object-oriented analysis for example, are inappropriate as they are not, in themselves, concerned with understanding the cooperative nature and characteristics of work but with modelling the information processes within the problem domain. As Madsen et al. (1993) put it, for example,

> The analysis phase is primarily concerned with understanding the problem domain, i.e. the referent system ... In this phase it is important that the developer is not restricted to (formal) mechanisms of a programming language like BETA. This also applies to any other formal language proposed for analysis including the many proposals for graphical notation. If the developer is restricted to the use of formal notation this may impose too narrow a view on the referent system. The developer should [therefore] make use of any means available when doing analysis, including informal description

Informal description contrasts with formal description, which reduces the referent system to a narrowly conceived technical realm. This, of course, does not mean that there is no place for technology-driven approaches in the analysis of the design space. Obviously there is, but as secondary points of view; as a means of abstracting from the real world and developing underlying models to support the cooperative work of intended users. In the first instance, however, technology-driven approaches provide little (if any) insight into cooperative work (Schmidt and Bannon 1992) as they are not designed to analyse that work but the information processes produced in the course of the work's production and coordination. With the emergence of CSCW the challenge to design is, then, one of finding an informal mode of description that supports analysis of the sociality of the design space and the moulding of technology to cooperative work.

The effort to locate a suitable candidate providing a social point of view on the referent system has attracted interest from across the human sciences, including Sociology, Anthropology, Psychology and the Organizational sciences, to name but a few. Organizational theory was a primary candidate in the field, although it rapidly transpired that it was unsuitable for the task. Joan Greenbaum (Knudsen et al. 1993) sums up the failings of the management perspective succinctly.

> I believe that the field of management science and its offspring organizational theory are like the emperor with no clothes. Everyone is looking at him, but no one is saying it. Organizational theory acts like the magic cloth that keeps us from looking at the essential issues within the workplace ... The field of organizational theory throws us off that course, as it defines Organizations and their behaviour as rational entities acting through managerial practices.

Although the subject matter may differ, the problems that emerged in the encounter with management science were the same as those found with cognitive theory and a multiplicity of other competing perspectives, namely methodological. Like cognitive theory, organizational theory assumes that the validity of its findings are guaranteed in the use of scientific methods. Accordingly, organizational theory emphasizes the need for rationally validated methods (generic analytic formats and mapping procedures) – i.e., methods where the 'validity' of the matter is established *prior* to their application to particular cases. Rationally validated methods determine how work is to be described and analysed in design. As Hughes (1993) puts it,

> They impose, by fiat, a version of reality insensitive to the ways in which the social world is a meaningful one and one constructed by those who live within it. In other words, [such] methods produce or construct the social reality they intend to investigate as a discovering science through the methods themselves; methods which do not so much discover facts about social life as construct a version of that life by its methods.

As a consequence, and as Greenbaum points out, the rationalist mentality embedded in methods of description so prevalent in the human sciences "keeps us from looking at the essential issues in the workplace", which is to say that rationalist methodologies gloss over and obscure the real world, real time character of work. Recognition of this fact soon emerged in the case of organizational theory's candidacy. Accordingly, it was recognized that what collaborative systems design required were not scientific credentials as it were, but approaches capable of securing adequate reference to the real world, real time character of Work and Organization (Knudsen et al. 1993).

In light of that need, designers have turned to the 'interpretative' traditions in anthropology and sociology – traditions that eschew natural

science modes of inquiry.[10] The requirement here was and is to devise methods

> that provide access to the world experienced by social actors themselves and methods appropriate to the phenomena being investigated. The catchword might be 'fidelity to the phenomenon', namely, the experiences and knowledge social actors exhibit in the course of their daily lives ... the prior requirement of this is the development of a descriptive apparatus rather than an explanatory one. (Hughes 1993)

The validity of any such apparatus depends not on *a priori* rationalizations but on the adequacy of the results it produces in its deployment. Within the context of design, and analysis of the design space in particular, any such apparatus will be required to handle a variety of work domains and pay careful attention to the subtleties of work in particular workplaces – subtleties that are too often obscured by the generic formats employed to explain the social character of Work and Organization and which predominate in the human sciences. Bound up with these issues – which are concerned with describing work-in-context – are requirements to identify cooperative work activities and their interdependencies. The implication here is that the cooperative work of intended users is not readily packaged (as it has not as yet been described anywhere) but needs to be brought out in the analysis of informal (i.e., non-technological) work descriptions. Placing an emphasis on description in the effort to understand social life from the perspective of those studied before stepping back to make a more detached assessment, ethnography presented itself as a potential candidate providing a social point of view on the referent system.

2.1 Ethnography: An Informal Mode of Description and Analysis

Ethnography emerged as a broad approach to social inquiry from anthropology in the early 1920s (Malinowski 1922) and by the end of the decade the approach was adopted for domestic employment by members of the Chicago School of Sociology (Prus 1996). The shift to domestic employment followed the initiation of a wide-ranging programme of research by Robert Park and Ernest Burgess into the social organization of urban life in Chicago. Gathering all kinds of data on a wide variety of topics, Park outlined the ethos of the research programme to his graduate students as follows.

[10]More precisely, such approaches eschew scientism, which sees the wanton misuse of scientific methods in pursuit of the misguided idea that all things may be adequately accounted for through the accomplishment of scientific practices.

> You have been told to go grubbing in the library, thereby accumulating a mass of notes and liberal coating of grime. You have been told to choose problems wherever you can find musty stacks of routine records based on trivial schedules prepared by tired bureaucrats and filled out by reluctant applicants for aid or fussy do-gooders or indifferent clerks. This is called 'getting your hands dirty in real research'. Those who counsel you are wise and honourable; the reasons they offer are of great value. But one more thing is needful; first-hand observation. Go and sit in the lounges of the luxury hotels and on the doorsteps of the flophouses; sit on the Gold Coast settees and the slum shakedowns; sit in the orchestra hall and in the Star and Garter burlesque. In short, gentlemen, go get the seat of your pants dirty in real research. (Cited in Prus 1996)

Park's injunction to 'go get your hands and the seat of your pants dirty' – i.e., to conduct research through first-hand observation – quickly proved itself to be a fruitful means of developing a rich portrait of the social organization of urban life (in sharp contrast to theorizing or playing around with statistical aggregations). The following sections address the work involved in getting your hands and the seats of your pants dirty, particularly the work involved in extracting some intelligible tale of cooperative work from the data that is gathered in the course of first-hand observation.

2.1.1 Investigating Cooperative Work

Having obtained access to a worksite, which is not necessarily the easiest of tasks but one that confounds prescription beyond the exercise of courtesy and commonsense (Rouncefield et al. 1997), one of the biggest problems often encountered in undertaking ethnographic research is establishing a sense of where to start. As Malinowski (1922) somewhat amusingly described the experience of starting his classic study, "I had periods of despondency, when I buried myself in the reading of novels, as a man might take to drink in a fit of tropical depression and boredom." Figuring out where to start the study is more often than not experienced as something of a daunting prospect, until the researcher realizes that where to start is really not the issue as cooperation abounds and one can begin anywhere within the boundaries of the design space. Starting somewhere is what counts. The researcher who is concerned with ethnomethodological analysis should also bear in mind that they cannot hope to have a clear enough sense of the work of the site to guide the study and determine particular areas of relevance at the outset. This should not be considered at all problematic since the ethnographer's task is to *uncover* matters of relevance, unfettered by preconceptions of what might be important. Why unfettered by preconceptions? As the late Herbert Blumer (1969) pointed out, most social science research, even much that is passed off as ethnographic, is not designed to develop a

close and intimate familiarity with the area of life under study.[11] Immersion in the field is often prefigured and directed towards abstract problems rather than what thoroughgoing *exploration* and *inspection* of the daily work of the site might have to say about such problems. Here the analyst might ask whether or not prefigured problems exist as practical problems at the site. If so, in what ways are they problematic for the site's staff? What problems do the site's staff encounter in their work? How do staff manage and conduct their work together? And so on.

In place of the flexible exploration and inspection of the site's work – exploration and inspection *driven by that work* – ethnographic inquiry is all too often started with generic analytic formats which are employed to formulate a research agenda and protocols for its investigation. In other words, generic analytic formats are used to pose a research problem which may be explored through the application of a particular set of research methods (such as task analysis, for example). As Blumer pointed out, none of this provides for first-hand knowledge of the work of the site however:

> See how far one gets in submitting proposals for exploratory studies to fund-granting agencies with their professional boards of consultants, or as doctoral dissertations in our advanced graduate departments of sociology and psychology! Witness the barrage of questions that arise: Where is your research design? What is your model? What is your guiding hypothesis? How are you operationalising the hypothesis? What are your independent and dependent variables? What is your sample? What is your control group? And so on. Such questions presume in advance that the student has the firsthand knowledge that the exploratory study seeks to secure. Since he doesn't have it the protocolised research procedure becomes the substitute for getting it!

Consequently, just what is seen through research protocol, is not a reflection of cooperative work, but a function of the methods applied and the theorizing done by the researcher in applying them. As Blumer put it,

> The questions that are asked, the problems that are set, the leads that are followed, the kinds of data that are sought, the relations that are envisioned, and the kinds of interpretations that are striven toward – all these stem from the scheme of the research inquiry instead of from familiarity with the empirical area under study.

[11]Herbert Blumer is, in a great many respects, the unsung hero of ethnographic research, being a leading member of the influential Chicago School of Sociology that instantiated the use of ethnography in urban environments in the late 1920s, following the pioneering work of Malinowski and others in more exotic settings. Blumer, in other words, was very much responsible for putting ethnography to work in the study of our own workaday activities and his insights are as pertinent today as they were when originally formulated.

If cooperative work and the practices whereby it is organized are to be made visible and available to design reasoning, the researcher must set aside his or her preconceptions and instead be faithful to the phenomenon, exploring and inspecting Work and Organization as it is observably 'put together', constructed and assembled by the Organization's staff in their real time collaborations. How is the researcher to be faithful to the real world, real time nature of cooperative work? What does 'being faithful' to that phenomenon consists of in accomplishing exploration and inspection of a site's work?

Exploration

There are no fixed set of procedures for accomplishing exploratory work, as how one comes to develop a familiarity with cooperative work will very much depend on the nature of the work under study. Consequently, just about any ethically acceptable array of techniques may be employed to explore the work of the site, insofar as they are appropriate to the study of that work. Like any member of ordinary society trying to discover the organization of work in a novel setting, the researcher might engage in direct observation of the work, being a co-located party to its accomplishment. They might be rather more remote, observing interactions on video or listen to talk on audiotapes. They might engage in informal talk or interviews with the site's staff, or listen to their conversations *in situ*; personal biographies may be elicited; group discussions conducted; letters, diaries, and records be consulted and discussed with parties to their production. To reiterate, just how the researcher comes to develop an intimate familiarity with the work of the site, will depend on the nature of the site's work. The daily work of some sites may practically exclude conducting informal interviews as the work unfolds, such as in doing interrogations in courtrooms or police stations. Other sites may exclude observation of participants' work via video, such as in psychiatric centres where 'being watched' may alarm inmates and trigger disturbing psychological episodes. Further still, what of counselling sessions or doctor–patient interaction? Just how the researcher goes about developing an intimate familiarity with the site's work is an open question to some extent, the limits of the extent being that they develop a thoroughgoing familiarity with what goes on without upsetting, offending, or jeopardizing the careers of parties to the work. Nonetheless, all that matters at this stage is that by some means acceptable to the parties to the work, the researcher develops ways of getting to know the work of the site.

Exploration work is highly flexible, then, and driven by the real world, real time character of worksite activities in contrast to the requirements of (pseudo)scientific protocol. While the misguided who harbour scientific pretensions may be scornful of such a general procedure, treating

first-hand observation as peripheral, as soft science, or journalism even, there is nothing soft about exploratory work. As Blumer put it,

> The flexibility of exploratory procedure does not mean that there is no direction to the inquiry; it means that the focus is originally broad but becomes progressively sharpened as the inquiry proceeds.

What should be borne in mind, then, is that the initial phase of an ethnographic study – exploration – is one of familiarizing oneself with the work of the site. So, at the outset, start anywhere, with any person that looks approachable and least likely to be bothered by the presence of a researcher, and collect as much material as possible of whatever sort is appropriate. In doing that, the researcher will find that at some point relatively soon, a concrete understanding of the work of the site and its organization will begin to emerge. They will then be able to decide where to focus their efforts to cover the elements of the worksite most relevant to the broader issues framing the research. It is important not to worry about issues of relevance at this stage – they will be resolved with time and closer *inspection*.

Inspection

The purpose of exploration is to gain first-hand knowledge of the work of the site and, thereby, to develop a concrete focus to the research – a focus that is emergent from and shaped by real world, real time cooperative work. Over the course of exploration, certain aspects of the work become more interesting than others. Certain activities and work practices start to capture the researcher's attention and become more pronounced. Certain analytic themes begin to emerge, such as the real world character of 'interviewing' in Blau's study, for example. These emergent categories of analysis start to direct the researcher's inquiries. They start to inspect them in fine detail.

> The procedure of inspection is to subject such analytic elements [as 'interviewing'] to meticulous examination by careful flexible scrutiny of the empirical instances covered by the analytical element.

In doing inspection, the researcher strives to understand emergent categories of analysis as they are put together by members at the worksite in the course of the activity's occurrence. So the researcher starts to gather materials from the activity in order to assemble *instances* of the activity actually being done and, thereby, to subject the activity to close examination and scrutiny.

Assembling instances of the particular activities that comprise the daily work of the site lies at the core of the inspection stage of ethno-

graphic research. The assembly of instances of particular worksite activities being done requires of the ethnographer that they visit and re-visit the work of the site to fill in emergent gaps in their knowledge of the work (video is an excellent tool to support inspection). Just what is happening there? Just how? These are ever-present questions in doing inspection and, indeed, those questions drive that work. The requirement to visit and re-visit the work of the site, to consult work as it is done in order to fill in the gaps in one's knowledge of it, stands in sharp contrast to the standard academic practice of filling in gaps through the use of generic analytic formats to interpret events that occur in the workplace (as will be elaborated in the following sections). It might be said that if the researcher finds themself in a situation of using generic analytic formats to interpret just what's happening and how – that is, of guessing, no matter how erudite the form – then they are going off track. That occasions of interpretation emerge is not a bad thing in itself, however, as it might also be said that the topic of one's guesswork provides direction to the inspection work. Insofar as guesswork is occasioned by *this* (interviewing in placing people in jobs, say) then *this* (interviewing work) is what the researcher needs to go back to and inspect in detail.

Ultimately, inspection work provides for the careful scrutiny of the work of the site. Thus, instances of particular worksite activities actually being done constitute the primary *unit of analysis* (although, as we shall see, this is not always the case in ethnographic research more generally). As Blumer described matters,

> Inspection is the opposite of giving a 'nature' to the analytic element by operationalising the element (for example, defining intelligence in terms of the intelligence quotient). It seeks, instead, to identify the nature of the analytic element by an intense scrutiny of its instances in the empirical world.

Before one can inspect anything, however, one must have materials with which to assemble instances of work for inspection.

2.1.2 Assembling Data or Instances for Inspection

In the course of getting the research done, the ethnographer accrues materials from the worksite – materials that are assembled so as to provide instances of particular activities of work actually being done, which come to constitute data for analysis. Simply put, materials are not data for analysis until made so. Just how worksite materials are transformed into data, and the consequences that work has for the production of findings, is a matter of some considerable importance. Before considering the production of findings, it is important to consider what the gathering of worksite materials consists of as a practical job of work, insofar as the

materials gathered come to constitute the focus of analysis from which findings informing the formulation of design solutions are extracted.

In a design context, ethnographic work is often characterized by the frenetic gathering of worksite materials. Note-taking on what is done, heard and overheard at the worksite is relentless. Sketches, diagrams, and photographs of spaces, places, and the arrangement of material artefacts (tools, instruments, technologies, documents, etc.) therein abound. Photocopying of official documents proliferates. Audio or videotapes of the site's staff in action amass. This, and more, is the 'stuff' of the ethnographic record, the material from which an account of the work of the site, and its organization, is extracted, assembled and compiled. Although a hectic activity, gathering materials from the worksite is the least of the problems one encounters in doing ethnographic work, as there is *nothing to find that is hidden*. Rather, gathering worksite materials consists of looking out for and recording what is already in plain view. As Rouncefield et al. (1997) point out,

> in 'plain view' ... [means] that there is nothing to see which requires a special method, a particular instrument, or a special capacity to find. The objective of the fieldworker is to collect a record of what ordinarily in the ordinary course of their activities, the persons involved in the setting do.

What kind of materials should be collected in order to make the work of the site visible then? Well it could be said that whatever can be grabbed from the course of staff's material work that makes the *making* of their ordinary activities observable (remember, even the most routine of activities must be constructed anew each and every time). Thus, in collecting worksite materials the ethnographer's job is to listen to the talk, watch what happens, see what people do, when, and where, to write it down, tape it, copy what documents can be copied, and so on. The following is an illustrative list of the sorts of useful worksite materials that can be recorded and collected together.

- Activity or job descriptions.
- Rules and procedures (etc.) said to govern particular activities.
- Descriptions of activities actually being done.
- Recordings of the talk taking place between parties to the actual doing of activities.
- Informal interviews with participants elaborating particular activities and the skills, competences, troubles, and practical solutions involved in getting them done.
- Diagrams of the material arrangement of the space and place within which staff are located and related, and the arrangement of artefacts therein.

- Photographs of artefacts (documents, diagrams, forms, computers, etc.) used in the course of activities actually being done.
- Videos of artefacts in actual use (in contrast to in prescribed use).
- Descriptions of artefacts in actual use (how artefacts are actually used in getting the work done).
- Workflow diagrams delineating the sequential order of tasks involved in the actual doing of particular activities.
- Process maps delineating sequential connections between activities.

All these materials included, one of the most important pieces of equipment in the ethnographer's toolkit is, without doubt, the notebook (or diary) in which everything the ethnographer thinks is worth recording is initially put down. Naturally, the important question is what should be recorded in the notebook and otherwise attended to when exploring and inspecting worksite activities.

> It is necessary, not only to note down those occurrences and details which are prescribed by tradition and custom to be the essential course of the act, but also the ethnographer ought to record carefully and precisely, one after the other, the actions of the actors ... With his attention constantly to this aspect of tribal life, with the constant endeavour to fix it, to express it in terms of actual fact, a good deal of reliable and expressive material finds its way into his notes. (Malinowski 1922)

While audio and video recordings are particularly useful pieces of equipment, indeed essential, the humble notebook cannot be dispensed with. The notebook is of such value because it is here that the ethnographer first records matters of potential relevance in attending to and describing the actions of actors in the actual doing of particular worksite activities, thus locating materials in the lived work of the site. No matter how good support technologies become, they cannot attend to or describe the actions of actors any more than they can identify matters of potential relevance to design in doing so. Those actions are dependent on the judgement and expertise of the ethnographer, on their sensitivity to the haecceities or lived details of interaction and collaboration. While audio and video recordings are an excellent way of preserving action for analysis and may be used to instruct others in the organization of cooperative work, the humble notebook is of importance as it is employed to develop a concrete sense of the cooperative work of a site and the practised ways in which that work is organized by parties to its accomplishment.

Typically, in the initial stages of fieldwork, the notes will appear as little more than random jottings about possibly interesting situations the ethnographer has witnessed, snippets of conversation, sketches of what persons X and Y did together, situational vignettes, and so on. As the research progresses, and the researcher gains a more informed sense of

what is going on at the site, such notes may become longer, more detailed, more structured and coherent. Cooperative topics or themes (such as 'interviewing' in Blau's study) begin to emerge as the researcher becomes more and more familiar with the setting, and the research becomes more directed in the sense that the ethnographer begins to get a better idea of what is important to the research, what more there is to find out about particular activities and events, and what more needs to be explored and inspected. Nonetheless, there is no intrinsic value to the worksite materials gathered. Those materials become valuable insofar as they can subsequently be *made relevant* to design through analysis and in terms of what they show of, and thus allow the researcher to say about, the work of a setting and its social organization.

2.1.3 Analysing Cooperative Work

As noted above, worksite material does not become data until it is made so. The purpose of this section is to explicate broad ethnographic methods or work practices for the production of data and findings. The practicalities of gathering material concerning the worksite and its constituent activities consists of the production of textual descriptions and sketched outlines of the ecology of the workplace (its physical layout), the artefacts used, the activities which take place there, and the relationship between activities (i.e., how they connect together). Where permission is given, the ordinary flow of conversation and workplace chat is recorded and transcribed at a later date, forming an important part of the ethnographic record. Fieldnotes and audio recordings are accompanied, where appropriate, by the use of video and still photography, which, in combination with textual description, set out to portray a concrete sense of the real world, real time organization of the work, rather than some idealized version of events (Rouncefield et al. 1994).

To anyone but the researcher, the composite fieldwork descriptions (the sketches, texts, transcripts, photographs, etc.) that comprise the ethnographic record, have a tendency to appear idiosyncratic, messy and confusing at first glance. Some kind of order needs to be brought to bear whereby some intelligible tale of cooperative work and its organization can be extracted from the raw material and findings can be made publicly available. The production of data and extraction of findings from the record is called analysis, which is often conducted through the use of a classification scheme for interpreting the data. Classification schemes are provided by the categories that make up generic analytic formats. These categories are used to 'code' the data, a method of analysis that has a long history in anthropology and social research more generally (Wolcott 1999). The method consists of reading the narrative that an analytic format is constructed of as instructions that allow the narrative's analytic

categories to be applied to the ethnographic record. The TAEMS 'task structure' narrative (Decker 1996; Lesser et al. unpub. manu.) provides a relatively simple example.

> A TAEMS task structure is essentially an annotated task decomposition tree. The highest level nodes in the tree, called task groups, represent goals that an agent may try to achieve. Below a task group there will be a sequence of tasks and methods which describe how that task group may be performed. Tasks represent sub-goals, which can be further decomposed in the same manner. Methods, on the other hand, are terminal, and represent the primitive actions an agent can perform ... The structure above will work out to be a tree structure containing goals and sub-goals that can be achieved, along with the primitive methods needed to achieve them. Annotations on a task describe how its subtasks may be combined to satisfy it. (Lesser et al. unpub. manu.)

The codification of workaday activities (e.g. as 'task groups', 'tasks', 'primitive methods', etc.) allows the analyst to identify the social organization of work (e.g. the 'task structure' organizing the work). The work of identification consists of treating fieldwork descriptions as signs that indicate a *type* of socially organized activity (such as a 'task'). Treated as signs, fieldwork descriptions are amenable to coding, where abstract analytic categories are attached to descriptions of real world activities. Once abstract analytic categories – such as 'task groups' and 'tasks' – have been attached to these activities it becomes possible to identify the organization of work (e.g. the 'task structure'). The social organization of workaday activities is not so much made visible through codification, as *rendered* apparent through the use of fieldwork descriptions as signs which function to index some presumed organization of work. It might otherwise be said that fieldwork descriptions are used as 'documentary evidences' that index or point to an underlying organization of activities articulated through the application of prefigured or *a priori* classification categories. Garfinkel (1967) instructs us that the use of this method of analysis consists of

> treating an actual appearance as 'the document of', as 'pointing to', as 'standing on behalf of' a presupposed underlying pattern [such as a task structure composed of task groups, tasks, and primitive methods, etc.]. Not only is the underlying pattern derived from its individual documentary evidences, but the individual documentary evidences, in their turn, are interpreted on the basis of 'what is known' about the underlying pattern. Each is used to elaborate the other.

Findings from the codification exercise are made publicly available through the further use of the analytic format to represent the social organization of work. Disengaged, impartial, matter of fact, generic analytic formats work through a particular method of instruction or pedagogy that uses the analytic categories that make up the format's narrative to describe workaday

activities as orderly enterprises (as activities organized in terms of 'task groups', 'tasks', 'primitive methods', and the rest). Generic analytic formats are employed, both in the act of codification and in representing findings to others, to describe the real world order of work and so configure the social organization of workaday activities in terms of underlying, analytically available, structures of action (such as 'task structures') which the format's narrative articulates. Thus, generic analytic formats are employed to make the social organization of work observable through *associating* the components that make up the analytic structure of action (e.g. 'task groups', 'tasks', 'primitive methods', etc.) *with* real world referents (ethnographic descriptions of interviewing in the employment agency, say).

> Once this way of analysing and talking about the social order is entertained, it can be used to grab onto little bits of the observable society, reinterpreted as illustrations of the master narrative. (Livingston unpub. manu.)

This is the pedagogy of 'normative' modes of ethnographic analysis (i.e., ethnographic approaches that employ generic analytic formats to describe, analyse and represent the organization of work). Through the use of the method, texts are constructed which instruct the reader how to see the social organization of workaday activities. Such texts make the organization of work 'instructably observable' by grabbing onto little bits of the observable society and using those bits to elaborate a theoretically constructed account of their organization. These accounts are overarching, furnishing generic descriptions of workaday activities as activities-organized-by-an-underlying-structure-of-action. They may be referred to as constructive analytic accounts.

2.1.4 The Problem of Constructive Analysis

It might be thought that the purportedly scientific character of constructive analysis warrants persistence with the approach. A curious feature of the generic analytic formats offered by the social sciences and employed by many ethnographers to account for the social organization of workaday activities casts serious doubt on such claims, however. As the late Harvey Sacks (1963) pointed out, unlike the generic forms of account offered by the natural sciences or mathematics, individual and concrete cases cannot be recovered from the generic accounts of the social sciences. This is because the identification of such things as 'tasks' and 'task groups', for example, is not the outcome of recognizing natural objects in the world, such as stones or trees, but the outcome of a complex course of categorization work. This means that generic analytic formats are always contestable when applied to particular cases under the auspices of the 'et cetera problem' (Sacks 1963).

The et cetera problem recognizes that any generic form of account may be indefinitely extended, although for practical purposes it must be brought to a close. 'Et cetera' does just that for practical purposes of writing (or talking) up an explanation of action and its organization. It is just that point of closure that comes into dispute, however, in assessing the adequacy of the description offered. More may be added may it not? Or the adequacy of the account itself may be challenged. Consequently, a refined analytic format accounting for the social organization of workaday activities is offered, or an alternative one is formulated, each of which is brought to a close in just the same way and in the same way comes into dispute. Such is the perennial nature of normative social science. Nothing ever gets settled once and for all as talk proceeds at an abstract and general level under the unremitting auspices of the et cetera problem. Rather than settling matters, new intellectual fashions emerge under the et cetera clause that frames normative discourse in the social sciences, all of which get conducted in the same fundamental way (Button 1991) – that is, through the construction of generic analytic formats in the attempt to formulate adequate solutions to the et cetera problem, a never-ending task brought about through the use of generic analytic formats in the first place. Consequently, given the endless invocation of the et cetera clause brought about through abstract accounting practices, it is by no means clear that the social organization of a particular ensemble of workaday activities *has* been accounted for when generic analytic formats are employed as instructions for locating and observing that organization.

The notion of instruction is key; generic analytic formats employed to account for the organization of activity X do not furnish adequate instructions for the visibility of X's organization as they do not describe the *particular organizational features* implicated in X's real world, real time accomplishment. Instead, X is used as a real world referent to render the constructive analytic account of the organization of X real worldly (Baccus 1986). Thus, one makes particular concrete objects – e.g. X in the real world – versions of a generic object – e.g. a 'task group' – and in doing so secures a real world referent for a particular analytic structure of action (e.g. a 'task structure'). As Blumer (1969) put it,

> this conventional protocol of scientific analysis is not suitable or satisfactory for the kind of analysis that is needed in direct examination of the empirical social world. Even though using the more realistic data yielded by exploration, the conventional protocol of scientific analysis still forces such data into an artificial framework that seriously limits and impairs genuine empirical analysis.

The understanding or knowledge of workaday activities and their organization generated by normative accounting practices is the product of the ethnographer's situated accomplishment of the work practices of constructive analysis. What we see, then, is not how workaday activities are

socially organized by parties to their accomplishment but how they are said to be organized from the point of view of the constructive analyst in furnishing accounts generated through the use of generic analytic formats.

The source of these probative troubles lies in the treatment of composite fieldwork descriptions or instances. As Garfinkel (1967) points out, coded results are treated as impersonal or disinterested descriptions of witnessed events. The disinterested, scientific character of coded results, which are the actual material of constructive analysis qua analysis in contrast to the stuff of the ethnographic record itself, is seen to be provided by the coding instructions. Coding instructions are treated as scientific protocols or procedures, which are said to provide for the rigorous description of the social organization of workaday activities in their application. Insofar as the ethnographic record is a product of that organization on any occasion of inquiry (as it is derived from direct observation of workaday activities), and in so much as the coding instructions are applied to the record of observed activities, then the coded results are taken to reflect the actual social organization of workaday activities. Thus, coded results are said to make the social organization of workaday activities in particular settings visible. As Garfinkel (1967) describes it however,

> Coded results consist of a persuasive version of the socially organized character of [some setting's work], regardless of what the actual order is, perhaps independently of what the actual order is, and even without the investigator having detected the actual order. Instead ... the [constructive analytic] account may be argued to consist of a socially invented, persuasive, and proper way of talking about [the setting and its activities] as an orderly enterprise, since 'after all' the account was produced by 'scientific procedures'.

Constructive analytic accounts of socially organized activities may be argued to be socially invented and by implication fictional in that, and precisely because, normative social science treats coded results

> in much the same way that one might treat a person's report on his own activities as a feature of his activities. (Garfinkel 1967)

Such a report does not describe the activities of which it is a feature, however – the activities themselves and the cooperative work practices implicated in their production and coordination (i.e., in their social organization) remain to be described. *A fortiori,* under the auspices of constructive analysis, the social organization of workaday activities *has not yet been described* but has been glossed over through the scientific rendering of work.

Furthermore, the methodology of constructive analysis denies any prospect of identifying the real world, real time social organization of

workaday activities as those practices have been designed to satisfy criteria of scientific rigour that are incongruent with the subject matter of the social sciences (Winch 1988). The phenomena seen, and thus the understanding generated through the practices of constructive analysis, are the products of those self-same practices and not of the practices constitutive of the phenomena itself. As such, normative practices of constructive analysis can do no other than pass the organization of cooperative work by. As Livingston (unpub. manu.) puts it,

> Ed Rose ... once told a story about a bar in Denver. He said it was a bad place: there were drugs, prostitution, fights, stabbings, shootings. Every once in a while the local police would stage a raid. They would get together a team and swoop down on the bar. The problem was, every time they did this, they never found any drugs, prostitution, fights, stabbings, or shootings. As Ed Rose put it, society was out-to-lunch. Every time the police went to look, the action was not there ... In classical sociology [and constructive analysis more generally], society is similarly out-to-lunch.

This is not to ridicule or ironicize constructive analysis but to point out the limitations of its work practices in the context of ethnographic study broadly construed. As Armour (1997) puts it, practitioners of constructive analysis

> have targeted innumerable phenomena for analysis and that the achievements of [constructive analysis] are beyond dispute is attested to by its bibliographies. It has targeted areas for analysis by 'describing', 'specifying', 'testifying', 'showing', 'demonstrating', and generally supplying adequate grounds *for inference*. By its practices a phenomena of order is made instructably observable.

Making the social organization of workaday activities instructably observable by providing *adequate grounds for inference* from a text is the primary achievement of constructive analysis. Being predicated on inference, the observability of cooperative arrangements of work is thus provided for through reasonable courses of instruction – the reasonableness of the matter consisting in the setting up and association of indexical relations between underlying analytic structures and real world referents.

Nevertheless, it is fair to say that we may entertain a well-grounded and warranted problem with constructive analysis. We may do so in that, and precisely because, the social organization of workaday activities has not yet been described in the accomplishment of constructive analytic work practices. The classical practices of constructive analysis systematically gloss over, pass by or obscure the social organization of workaday activities under the auspices of 'doing good scientific work'. Consequently, instead of explicating the social organization of workaday activities as that organization is observably produced in the day-to-day collaborations of

participants, and by participants, constructive analysis configures the social organization of work as underlying structures (patterns, processes, networks, and the rest) that are said to shape and thus organize workaday activities. Constructive analytic structures take precedence and the setting under study becomes yet another incidental area in which to observe such structures at work. Ordinary society is, as such, invariably out-to-lunch.

Ultimately, the source of the probative troubles that beset ethnographic analysis may be located in the substitution of the members' perspective for that of the professional analyst. With that substitution goes the recognizable (observable and reportable) social organization of workaday activities and in its place goes the social organization of workaday activities as seen and understood through the constructive analyst's work practices – work practices which describe, analyse and represent the social organization of workaday activities in terms of generic analytic formats. In effecting this substitution – real world organization of work *for* constructive analytic account of the real world organization of work – constructive analysis makes the sociality of workaday activities the analyst's problem. An alternative way of treating the issue is to see the 'problem of order', of social organization or cooperation, as a members' problem (Zimmerman and Wieder 1973), that is, as the problem of parties to interaction and the accomplishment of workaday activities. The following section examines two distinct approaches to ethnographic analysis that have come to prominence within CSCW by treating the problem of order as a members' problem.

2.2 Analysing Cooperative Work: Sacks and Garfinkel

Sacks' investigations into the shortcomings of conventional modes of analysis saw the development of two alternative modes, one of which unwittingly takes the analyst up the constructive analytic path under the auspices of Conversation Analysis (Lynch and Bogen 1994), and another developed by Harold Garfinkel in light of comments by Sacks, which eschews the use of generic analytic formats entirely. This latter approach to analysis was initially characterized as 'ethnomethodology', an analytic approach that has evolved over time under the auspices of the radical studies of work programme (Garfinkel and Wieder 1992) or, more simply, studies of work. The studies of work programme was inspired by Sacks' recognition that constructive analytic accounts ignore the real world, real time interactional and collaborative work whereby workaday activities come to assume their distinctive character as organized activities. As Garfinkel puts it,

> Harvey Sacks speaks of a curiosity in the work and history of the social sciences: the 'missing interactional what' in lay and professional studies of organization. Several observable phenomena make specific what he is talking about. 1)

> Available for observation is the omnipresence of accountable organizations of commonplace activities like 'families', 'faculties', 'traffic', 'welfare agencies', 'hospitals', 'manufacturing plants', 'city governments', or 'street gangs'. 2) It is a matter for observation too that endlessly many inquiries accompany these accountable organizations as constituent features of them. It is to be observed in these accountable organizations and their inquiries that the occasioned, embodied, interactional just-so just-what of ordinary activities remains ... ignored, unknown, unsuspected, and unmissed as technical phenomena. 3) Finally, there is to be observed that 1) and 2) taken together compose a technical phenomenon that is discoverable, is consequential, and for the study of naturally organized activities is criterial. The phenomenon consists of the essential, used, and ignored relevance to the collaborated production of the orderliness ... [of] ordinary activities, of the occasioned, embodied, interactional just-so-and-just-what of ordinary activities. (Garfinkel unpub. manu. 1)

It might otherwise be said that in accounting for the organization of ordinary (workaday) activities, the social sciences pass by, ignore, and otherwise fail to describe (and thus miss) the observable and reportable collaborative work of the streets through the accomplishment of which people construct and produce accountable organizations of commonplace activities – like 'families', 'faculties', 'traffic', 'welfare agencies', 'hospitals', 'manufacturing plants', 'city governments', 'street gangs', and the rest (Garfinkel and Sacks 1970). It was plain to Garfinkel and Sacks, then, that there was a significant *gap* in the social science literature and it is this that their pioneering work set out to address.

The gap in the literature provided a common focus for the study of naturally organized (rather than theoretically organized) activities, providing the opportunity to develop a rigorous empirical approach to the study of cooperative work and its organization, particularly through exploring the notion of 'member'.

> The notion of 'member' is at the heart of the matter. We do not use the term 'member' to refer to a person. It refers instead to mastery of natural language, which we understand in the following way.
>
> We offer the observation that persons, in that they are heard to be speaking a natural language, *somehow* are heard to be engaged in the objective production and objective display of commonsense knowledge of everyday activities as observable and reportable phenomena. We ask what it is about natural language that permits speakers or auditors, and in other ways to witness, the objective production and objective display of commonsense knowledge, and of practical circumstances, practical action, and practical sociological reasoning as well. What is it about natural language that makes these phenomena observable–reportable, i.e., *account-able* phenomena? ...
>
> The interests of [our] research are directed to provide, through detailed analyses, that account-able phenomena are through and through practical accomplishments. We shall speak of 'the work' of that accomplishment in order to gain the emphasis for it of an ongoing course of action. 'The work' is done as assemblages of practices ... (Garfinkel and Sacks 1970)

With the notion of member, the missing interactional what of organizational studies is specified as assemblages of work practices, which is to say that naturally organized workaday activities come to assume their distinctive character as organized activities through discrete ensembles of work practices. Work practices are made available as accountable phenomena – i.e., as observable empirical phenomena that may be reported or described – through the naturally occurring talk of parties to the work. Thus, the organization of cooperative work may be accounted for empirically, and in the first instance, by attending to the talk of parties to the work, and in the second instance, by explicating the work practices made visible through that talk.

2.2.1 Conversation Analysis

Sacks approached the study of cooperative work and its organization through the development of Conversation Analysis (CA). Without going into undue detail, it is worth considering CA's treatment of natural language and analysis of work practice in order to appreciate the alternative approach developed by Garfinkel.[12] At the heart of CA stands the notion of the 'turn-taking machine' (Sacks et al. 1974; Ruhleder and Jordan 1999).

> Turn-taking is used for the ordering of moves in games, for allocating political office, for regulating traffic at intersections, for serving customers at business establishments, and for talking in interviews, meetings, debates, ceremonies, conversations, etc. ... It is obviously a prominent type of social organization, one whose instances are implicated in a wide range of other activities. (Sacks et al. 1974)

Sacks and his colleagues observed that turn-taking was a significant feature of naturally occurring conversation, which offered the prospect of accounting for the organization of ordinary activities.

CA construes of natural language as a 'speech exchange system' which parties to conversation employ to assemble and coordinate (i.e., to organize) interaction through the allocation, management, and control of turns at talk. Sacks and his colleagues wanted to find out how the speech exchange system enabled conversationalists to do this. Examining audio-recordings of naturally occurring talk, it was observed that in conducting conversations, speakers design their talk for recipients by *constructing turns*. For example,

Jeanette:	Oh you know, Mittie- Gordon, eh- Gordon, Mittie's husband died (0.3)
Estelle:	Oh whe::n
Jeanette:	Well it was in the paper this morning.
Estelle:	It wa::s,
Jeanette:	Yeah

[12]For a thorough review of Conversation Analysis, see Lynch (1993).

Such utterances are said to be made up of *turn-constructional components*, of which there are a plethora of *unit-types* (see Sacks et al. 1974). Turn-constructional components provide for turn-transition between speakers by providing a *transition relevance place* (e.g. It wa::s?) in the unfolding flow of talk. In examining transition relevance places a discrete group of turn constructional units called *turn-allocation components* were identified. For example,

Sara:	Ben you want some ( )?
Ben:	Well all right I'll have a,
	((pause))
Sara:	Bill you want some?
Bill:	No.

Turn-allocation components are distributed into two groups: 1) those in which a next turn is allocated by the current speaker selecting the next speaker (as above), and 2) those in which a next turn is allocated by self-selection. Questions, greetings, summonses, invitations, and more, are a special class of turn-allocation components all of which select a particular recipient who may then speak next. Such utterances are classed as *adjacency pairs*. Adjacency pairs consist, as the name suggests, of a first-pair part (e.g. a question) which is connected to an adjacent second-pair part (e.g. an answer). Not only do such devices select the next speaker but they establish the sense of the relevant type of action to be produced in response. This is not say that the selected speaker will respond in the prompted way, only that turn-transitions may, and often are, assembled and coordinated through the use of adjacency pairs. Insofar as the selected speaker may not respond accordingly, adjacency pairs are said to be 'conditionally relevant'. That is, they organize turns at talk on condition that the selected speaker also finds the prompted action relevant as well. Alternatively, persons engaged in conversation may self-select at the projected end of the current speaker's story, joke, answer, or any other type of utterance that does not select a particular recipient.

The use of both groups of turn-constructional units is governed by some basic rules for their application. Sacks et al. (1974) described these rules as follows:

1) For any turn, at the initial transition relevance place of an initial turn-constructional unit:
   a) If the turn-so-far is so constructed as to involve the use of a 'current speaker selects next' technique, then the party so selected has the right and is obliged to take next turn to speak; no others have such rights or obligations, and transfer occurs at that place.
   b) If the turn-so-far is so constructed as not to involve the use of a 'current speaker selects next' technique, then self-selection for next speakership may, but need not, be instituted; first starter acquires rights to a turn, and transfer occurs at that place.

c) If the turn-so-far is so constructed as not to involve the use of a 'current speaker selects next' technique, then current speaker may, but need not continue, unless another self-selects.

2) If, at the initial transition relevance place of an initial turn-constructional unit, neither 1a nor 1b has operated, and, following the provision of 1c, current speaker has continued, then the rule-set a–c reapplies at the next transition relevance place, until transfer is effected.

These rules constrain each of the turn-taking options they provide and are constrained by one another, defining in their use participants' rights and obligations to speak and listen. Thus the rule-set ensures that the normative conversational order 'one speaker at a time' is produced and accomplished in conversational settings of all kinds.

Naturally, there are periods in any conversation when more than one speaker speaks, when interruptions are made, and when turns at talk are violated in various ways. Nonetheless, the operation of the rule-set 'repairs' violations and restores normative order. If, for example, a current speaker selects a next speaker (Rule 1a) and they fail to respond, then the current speaker, or some other participant, may employ components in compliance with the options provided by Rule 1c. The rule-set not only supports the production and accomplishment of a normative conversational order, then, but also provides for the maintenance of that order in its in vivo production. Consequently, Sacks et al. described the basic device organizing talk as an "interactionally managed, party-administered, local management system". It is a local management system in that the turn construction and allocation components and rules comprising the device allow turn-size and turn-order to vary according to the local circumstances of conversation production, across variations of participation, and in the face of violations. It is interactionally managed in that turn-allocation and transition is accomplished in concert by parties to the developing course of each turn and their achieved orientation to a next turn in the course of the current turn's production. And it is party administered in that it subjects the taking of turns to the control of parties to the conversation's talk. Importantly, Sacks et al. noted that the principle

> mechanism by which the system lends itself to party administration, by which turn-size and turn order determinations are integrated, and by which the system achieves comprehensiveness for any turn-transition, is the option-cycle provided by the ordered set of rules.

The underlying rule-set constitutes a *coordinating mechanism* providing for the local operation of a generic machinery that enables speakers and hearers to construct, allocate and manage turns at talk and so organize their interactions. Thus, Conversation Analysis accounts for the social organization of workaday activities in terms of a generic ensemble of

conversational practices governed by an underlying rule-based conversational machinery. Just what that organization of work consists of on any occasion may be explicated by attending to the workings of the turn-taking machinery as made available by parties to the setting's talk.

The job of explication may be conducted through specialized methods of description devised for the job. The most notable of these was developed by Gail Jefferson (1978). Jefferson devised a generic "transcript format" for the description of natural language utterances. The format seeks to provide a technical description that "will look to the eye how it sounds to the ear", thereby allowing the workings of the turn-taking machine to be identified. This is achieved through the use of a set of symbols that track events through a conversation, as in the examples provided above. Codification symbols would perhaps be a more accurate description of such devices, however, as the following sequence of CA shoptalk serves to demonstrate.

Jon:	Does anyone have references for published observations on 'latching'? I am wondering if speculation has been made on the interactional work accomplished by this phenomenon.
Dave:	[I think the notion] was used to refer to changes of turns of talk that were so quick as to show virtually no time lag between the end of the previous utterance and the beginning of the next. We used a '=' sign at the end of the last word of the utterance to which the second was latched, and at the beginning of the first word of the latched utterance. I believe that nomenclature was in Jefferson's transcription symbols.
Don:	Maybe it's just me but I cannot make/hear any distinction between 'changes of turns of talk that (are) so quick as to show virtually no time lag' and instances of 'no-gap' speaker transitions. Consequently, I only use the '=' symbol in my transcripts to indicate a continuation of same speaker's turn on another line.
Geoffrey:	The latching symbol (=) is meant to indicate those instances of no-gap turn transition ... These are 'marked' transitions (because they begin early) when compared with the majority of transitions (during which a beat of silence develops between the end of the last turn and the beginning of a next). (Email extracts cited in Crabtree 2001a)

What the talk makes available in observable and reportable details of real world work practice is that applying transcription symbols is not simply a matter of mapping the empirical features of talk but a matter of skill and judgement. Just what does a particular symbol mean? Just when should it be applied and just how? By way of an answer *instructions* for the application of transcript symbols are furnished in CA's shoptalk (and its texts). In other words, the application of transcription symbols relies on the use of coding instructions which 'tell' the user just how to apply them. Once signs – such as latching symbols – have been attached to natural language utterances and workaday activities alike through coding, it becomes possible to identify the

organization of work (e.g. the turn-taking machinery in use). The organized character of workaday activities is not so much made visible through CA, as rendered apparent through the treatment of natural language utterances as signs which function to index a presumed underlying organization of work. CA conducts its daily business not through the explication of the work practices organizing workaday activities, but rather, through *the production and interpretation of signs* (Garfinkel and Wieder 1992). In other words, and as Lynch (1993) notes, when pressed, CA is only logically empirical. Its technologies of production, particularly transcript notation and (of late) Interaction Analysis (Jordan and Henderson 1995), lend an illusion of rigorous empirical work which hides a very conventional art (Crabtree 2001a).

2.2.2 Ethnomethodological Analysis

Instead of asking what the turn-taking machinery is doing when members take turns at talk, with due respect to Conversation Analysis, an alternative approach to the analysis of cooperative work through natural language use might be to ask what members are doing when they do taking turns at talk. Lynch (1993) suggests that this analytic orientation refocuses attention on talk to the *work done* through talking. As Michael Moerman (1992) puts it,

> talk is not an object of study in its own right. Talk is, rather, the locus, accomplice, and accomplisher of social organization.

Talk, in other words, is a tool that people use to get their activities done together. As Wittgenstein (1992) reminds us, in their capacity as tools "words are also deeds". Thus, the concern with talk becomes one of what is being done in and through talking; a matter that goes to the heart of collaborative systems design as it is the work not the talk of computer users that computers will be embedded in, just as their talk is embedded in and reflexively elaborates that work. Rather than ask what it is about talk that engenders coordination, then, refocusing the issue directs our attention to the work people do together in and through talking, thereby coordinating their actions. Of course the question is: just how might work practice be analysed through talk?

Rather than employ some generic analytic format (such as a transcription format or a classification scheme), the analyst might instead attend to the conversational *formulations* produced by members in their talk together (Garfinkel and Sacks 1970). As Garfinkel and Sacks point out,

> formulating is an account-able phenomenon. This is to say that (a) it is a phenomenon that members make happen; that members perform. (b) It is observable by members. (c) In that members can do the phenomenon and observe it, it is reportable.

As analysts, we can observe members talking, listen to their conversations, and describe their formulations. We can observe and report members' formulations not because we possess some special analytic skill, but because of an ordinary expertise that we constantly employ in the unfolding and collaborative flow of everyday life. Conversational formulations are to be found anywhere and everywhere and we can observe and report them because we are, first and foremost, members ourselves (being a 'designer', a 'work analyst', a 'mother', etc., comes after). As members, we are masters of natural language who conduct our everyday affairs with one another through conversational formulations. Doing and recognizing formulations is a fundamental feature of our ordinary everyday competence. Indeed we display (or fail to display) our competence in the practical situations that make up our lives through doing and recognizing formulations. As competent natural language users we are *masters* in doing and recognizing formulations, hence the fact that we can hear and subsequently analyse conversational formulations being done by others.

It is notable that when we hear formulations being done, one of the things we hear is what is being done. In others words, in the course of talking together, it is observable that one of the things that conversationalists do over the course of their talk is articulate what it is that they are doing, what is going on, what project of action they are together engaged in here and now. This practical course of articulation is the object of analytic attention to conversationalists' talk as it displays the *interaction being engaged* in by the parties to the talk and so makes the cooperative work of the setting available to report and analysis.

Conversational Formulations in the Workplace (The Library Help Desk)

The analytic value of attending to members formulations may best be appreciated through a practical example. An extract of talk that routinely occurs at library help desks is presented and analysed below. The example is selected because of its relevance to a design project, which sought to explore ways of supporting the cooperative work involved in searching for information in libraries – a design case that is addressed in the following chapters to elaborate the relationship between ethnomethodologically-informed ethnography and design.

Libraries have long been a site of technical development and have seen the relatively simple inventory lists of the eighteenth century transformed into complex cataloguing systems in the nineteenth century, to card-based index systems in the twentieth century. The development of the computer saw the widespread implementation of the Online Public Access Catalogue (OPAC) in the early 1970s (Hildreth 1982). Ethnographic studies of OPAC use suggest that OPAC works well in situations where users know in advance what information they are searching

for (Twidale et al. 1997). OPAC is rather less effective, however, in situations where users do not know what information they require in advance but are interested in a general topic or theme (a very common situation in the library and other settings). Users often encounter difficulties in such situations and may turn to the help desk for assistance. Prior studies of 'intermediated searching' (i.e., searching conducted by users in collaboration with help desk staff), and particularly the canonical work of Robert Taylor (1968), suggest that information requirements are identified in such situations through sophisticated methods of interrogation.

> These methods are difficult to describe, indeed some believe they are indescribable ... [Because] We are dealing here, of course, with a very subtle problem – how one person tries to find out what another person wants to know, when the latter cannot describe the need precisely ... The negotiation of reference questions is one of the most complex acts of human communication. In this act, one person tries to describe for another person not something he knows, but rather something he doesn't know. (Taylor 1968)

Taylor described the work of interrogation as 'filtering work', which consists of translating expressions of the information requirement provided by users into descriptions that fit the library catalogue's organization. The work of translation is said to be organized by passing expressions of the information requirement through five filters, which articulate 1) the general character of the search, 2) the user's interest and 3) motivation, 4) the relationship of the inquiry to the catalogue's organization (e.g. to literature, science, art, etc.), and 5) what might constitute an acceptable answer to the query (e.g. information on a particular topic, such as quantum physics). In providing a constructive analytic account, however, we are not told how expressions are passed through these five filters and so in the context of the design case the need arose to inspect the accomplishment of filtering work directly. The following sequence of naturally occurring talk at the help desk involves two users and one member of staff. While occurring in a specific setting and for specific purposes, the organization of that talk provides methodological insights for the analysis of cooperative work more generally.

> Two users approach the help desk.
>
> 1. Sarah: Could you tell us where market – what was it – market intelligence?
> 2. Lisa: Yeah.
> 3. Sarah: Market intelligence?
> 4. Sylvia: Marketing is C floor. (Staff points to the OPAC system located at help the desk.) Do you know how to use the screens?
> 5. Lisa: Yeah but,
> 6. Sylvia: You need to find the classmark for the book. (Sylvia leaves the help desk, leads Lisa and Sarah over to a nearby OPAC terminal, and initiates a title search.)

7. Lisa: It's not a book.
8. Sarah: It's like information, information about these particular products and services. It's called market intelligence and leisure intelligence et cetera et cetera.
9. Sylvia: And is that the name of,
10. Sarah: That's the name – market intelligence and leisure intelligence. It's not a book as such. It's usually in the reference library.
11. Sylvia: Is, is it a serial?
12. Lisa: Yeah.
13. Sylvia: It's a serial. (Sylvia initiates a serial search on OPAC.)
14. Lisa: It's a journal.
15. Sarah: It's not so much a journal but it does come out every few months.
16. Sylvia: (Browsing through the serial search retrieval list.) Is it marketing intelligence and planning? Is that the one? (Sylvia points to an item on the retrieval list.)
17. Sylvia: T6 – it's a journal.
18. Sarah: No. It's not a journal.
19. Sylvia: Do you want to check at that and find the journal itself? (Sylvia points to the item's classmark on the OPAC screen, which tells the users where the item is located in the library.)
20. Sarah: Been there.
21. Sylvia: But have you actually looked at the classmark?
22. Lisa: Yes.
23. Sarah: Yes.
24. Sylvia: You've looked at that and it's not what you're looking for?
25. Sarah: It's not what I'm looking for.
26. Sylvia: Right; but that's the title of the book you're looking for – marketing intelligence?
27. Sarah: Market intelligence, and its got a list of all the products and services – it's basically a reference book – it tells you about particular market products and services and what to look for.
28. Sylvia: You've checked in the reference area?
29. Lisa: Well, no.
30. Sylvia: Right. (Sylvia takes the users to the reference area, returning alone to the help desk some three or four minutes later.)
30. Staff: What was it she wanted? What did she ask for?
31. Sylvia: Marketing intelligence.
32. Staff: Marketing intelligence?
33. Sylvia: Which is a joke – she didn't want that. I eventually got out of her that it was breweries, which we've got in the reference area.

Close attention to members' conversational formulations *instruct the analyst* that the cooperative work of filtering work consists of the following organizational phenomena.

1. The initial expression of a query in an intermediated search consists of, and is organized in terms of, the formulation of a *specifically vague description* of the information requirement.

1. Sarah: Could you tell us where market – what was it – market intelligence?
2. Lisa: Yeah.
3. Sarah: Market intelligence?
4. Sylvia: Marketing is C floor.

This is a very vague description insofar as it covers many things and so just what is wanted is not at all clear but at the same time, and without contradiction, it is also very specific as the information required is, in some yet to be articulated way, nonetheless understood to be connected to 'marketing'. The provision or elicitation of a specifically vague description is the first action in an unfolding course of cooperative work. It serves to circumscribe the search area.

2. Furnishing a specifically vague description does not provide for the accomplishment of the search, only for the undertaking of a search in cooperation with help desk staff. In order to find and retrieve information that satisfies the users' information requirements, the connection between the search area (e.g. marketing) and the information requirement stands in need of articulation. Members' formulations instruct the analyst that this articulation work consists of and is organized through a discrete course of *categorization work*, where more detailed descriptions of the information requirement are first elicited and then made intelligible in terms of the online catalogue's organization.

6. Sylvia: You need to find the classmark for the book. (Sylvia leaves the help desk, leads Lisa and Sarah over to a nearby OPAC terminal, and initiates a title search.)
7. Lisa: It's not a book.
8. Sarah: It's like information, information about these particular products and services. It's called market intelligence and leisure intelligence et cetera et cetera.
9. Sylvia: And is that the name of,
10. Sarah: That's the name – market intelligence and leisure intelligence. It's not a book as such. It's usually in the reference library.
11. Sylvia: Is, is it a serial?
12. Lisa: Yeah.
13. Sylvia: It's a serial. (Sylvia initiates a serial search on OPAC.)
14. Lisa: It's a journal.
15. Sarah: It's not so much a journal but it does come out every few months.
16. Sylvia: (Browsing through the serial search retrieval list.) Is it marketing intelligence and planning? Is that the one? (Sylvia points to an item on the retrieval list.)

In terms of the organization of cooperative work, the shared use of OPAC consists of the joint formulation of *preliminary information requirement categories* where specifically vague descriptions (such as marketing intelligence) are elaborated (as being about 'products and services', 'marketing and leisure') and categorized in terms that fit the

catalogue (e.g. as 'books', 'serials', 'journals', and the rest). These categories serve to elaborate the information requirement.

3. Members' formulations instruct the analyst that preliminary information requirement categories are, in turn, used cooperatively as resources providing for the joint formulation of more *specific information requirement categories* identifying candidate categories of solution.

17. Sylvia: T6 – it's a journal.
18. Sarah: No. It's not a journal.
19. Sylvia: Do you want to check at that and find the journal itself? (Sylvia points to the item's classmark on the OPAC screen, which tells the users where the item is located in the library.)
20. Sarah: Been there.
21. Sylvia: But have you actually looked at the classmark?
22. Lisa: Yes.
23. Sarah: Yes.
24. Sylvia: You've looked at that and it's not what you're looking for?
25. Sarah: It's not what I'm looking for.
26. Sylvia: Right; but that's the title of the book you're looking for – marketing intelligence?
27. Sarah: Market intelligence, and its got a list of all the products and services – its basically a reference book – it tells you about particular market products and services and what to look for.

This course of categorization work elaborates the information requirement in greater detail and so allows users and staff to narrow down the search. Thus, over a discrete course of categorization work a vague description such as 'marketing intelligence' is transformed into something 'about products and services, marketing and leisure' and then into something that 'lists products and services' and a 'reference book' about 'breweries' to be precise. Thus, the joint formulation of specific information requirement categories allows staff to focus down on a particular part of the catalogue and identify the information required.

4. Members' formulations instruct the analyst that categorization work may be a practically troubled affair, when users and staff find it difficult to formulate a shared category of inquiry (is it a book, serial, journal, what?). The search cannot continue in the absence of shared categories of inquiry and staff elicit users' search histories in order to identify shared categories and so elaborate and refine the search.

21. Sylvia: But have you actually looked at the classmark?
22. Lisa: Yes.
23. Sarah: Yes.
24. Sylvia: You've looked at that and it's not what you're looking for?
25. Sarah: It's not what I'm looking for.
28. Sylvia: You've checked in the reference area?

29. Lisa: Well, no.
30. Sylvia: Right. (Sylvia takes the users to the reference area, returning alone to the help desk some three or four minutes later.)

Search histories are appealed to and elicited as a matter of course when categorization problems arise in the accomplishment of filtering work. The appeal to search histories both eliminates certain search areas and elaborates the search by furnishing new categories of information (Crabtree et al. 1997).

2.2.3 General Methodology: Thick Description

This account of filtering work is not exhaustive but illustrative of the analytic method. It shows that members' formulations make cooperative work and the real world, real time practices organizing that work, visible. Formulations implicated in the accomplishment of filtering work show that filtering work consists of the formulation of specifically vague descriptions, which are transformed through appeals to the users' search history and the formulation of preliminary and more specific information requirement categories into descriptions that fit the library catalogue (in contrast to a number of analytically constructed filters). The practices organizing this work are not distinct from the work but *identical to it* (Garfinkel 1996). The notion of work practice draws our attention to the practical *courses of action* (such as the formulation of specifically vague descriptions, etc.) that are recurrently engaged in order to get the job (e.g. filtering work) done and so organize the day-to-day accomplishment of the work. No special methods are required to identify these practical courses of action, what is needed instead is 'thick description' (Ryle 1971).

Thick description stands in contrast to thin description and delineates the difference between mere behavioural accounts describing only what can be seen literally and those characteristics which identify some action as the action it recognizably is for members. As Ryle puts it,

> [the] thinnest description of what the person is doing, e.g. pencilling a line or dot on paper ... requires a thickening, often a multiple thickening, of a perfectly specific kind before it amounts to an account of what the person is trying to accomplish, e.g. design a new rigging for a yacht.

The notion of thick description draws attention to the need for "multiple thickening of a perfectly specific kind" when describing workaday activities. This thickening specifically requires that the analyst describe the 'accomplishment levels' implicated in work's observable production and recognition. The accomplishment levels relevant to the analysis of cooperative work consist of the description of members' formulations as they are hearably produced and recognized *in situ* by parties to their produc-

tion and recognition (as questions, answers, greetings, arguments, etc.). No special transcript formats are required here as the aim is to convey the ordinary meaning of what was said, and in the ordinary ways that it was said, rather than provide technical accounts. Ordinary textual practices of description are perfectly fit for the job and, unlike Conversation Analysis, provide for widespread intelligibility of the text. The second accomplishment level requires that the analyst describe relevant non-verbal practical actions, particularly those involving material resources or artefacts (such as OPAC use, for example) if the account is to be coherent and meaningful. Accomplishment level two makes the real world, real time use of technology visible and available to analysis. Descriptions of relevant non-verbal, technologically-mediated actions should be woven into the description of members' formulations in the places that they occur. When assembling data or instances for inspection, the analyst should be particularly concerned with providing materials supporting the description of these two accomplishment levels.[13]

The third accomplishment level requires that the analyst describe the work practices made visible by members' formulations and relevant non-vocal actions. The analyst may achieve this by attending to two general features of work. In the first instance, the analyst may note that work is *sequentially organized*, having a beginning, a middle and an end at its most basic level. In the second instance, and insofar as work has a beginning, middle and end, then work might be said to be composed of *component events*. The organization of cooperative work might be explicated, then, by attending to the sequential structure of work and describing the component events that structure is made up of.

> Technically, social phenomenon are not simply sequential organizations consisting of component events. They are, in addition, 1) situated; 2) available to inspection by and to be done by members; 3) contingent practical achievements; 4) unavoidably collaborative; 5) practiced productions – those practices being 'unique' or essentially tied to the phenomenon's production; 6) those unique practices *visibly provide* in the course of the phenomenon's occurrence for its analysability; 7) they contingently occasion practical troubles which are repaired in 'characteristic detail' as a feature of their *stable* achievement. (Garfinkel unpub. manu. 2)

As Garfinkel points out, description of the component events that make up the sequential structure of work serves to elaborate the unique work practices through the accomplishment of which workaday activities come to assume their distinctive organized character. It is, for example, through the concerted formulation of specifically vague descriptions, preliminary and

[13]Photographic and video material is particularly useful when addressing accomplishment level two and may be interwoven with members' formulations to elaborate the material resources and artefacts implicated in the work (Crabtree 2001b).

more specific information requirement categories, and the appeal to the user's search history in times of trouble, that filtering work in the library comes to assume its distinctive character as an organized job of cooperative work. Furthermore, it is through the accomplishment of these work practices that filtering work is made into a stable achievement – an activity that may be undertaken time and again, day after day, and which others may be trained in and for other reasons instructed in if need be. This is not to say that work practice is immutable; after all, the historical development of the library instructs us that work practice changes over time. It is to say that given the current Organization of Work in some setting, the work of the site is stably organized through a particular assemblage of work practices that the analyst may identify through direct observation of the work and description of accomplishment levels one to three.[14]

The notion of thick description is not to be taken as a claim to have furnished a complete and exhaustive description of all the factors involved in work organization. As Ryle reminds us, "there is no top step on the stairway of accomplishment levels" and so any description may be infinitely extended. For purposes of studying and analysing cooperative work, however, the assembly and inspection of instances of work is *adequate* insofar as the description of accomplishment levels one to three makes visible how workaday activities are put together by participants in the course of their interactions and what the putting together or co-construction of workaday activities therefore relies upon.[15] Thick description of the three accomplishment levels is adequate, then, as the levels make available the missing interactional what of organizational studies, an accomplishment which confounds generic analytic forms of account or explanation more generally. As Garfinkel (1996) puts it,

> Just-in-any-actual-case immortal ordinary society is a wonderful beast. Evidently and just in any actual case, God knows how it is put together. The principal formal analytic devices currently in hand, of paying careful attention to the use, the design, and administration of generic representational theorising [i.e., generic analytic formats] ... get a job done that with the same technical skills in

[14]In keeping with the edicts of Ryle's original exposition, the unique focus on the 'description of accomplishment levels', rather than on the 'inscription of structures of signification', sets this reading of the notion of thick description apart from Clifford Geertz's (1973) popular misreading of Ryle's work.

[15]Naturally, when dealing with a discrete ensemble of workaday activities, instances must be assembled to analyse the individual workaday activities that make up that ensemble or working division of labour (Crabtree 2000a). Instances 'latch together' to elaborate the working division of labour and, in doing so, elaborate the flow of work through the division of labour. Thus instances may be employed to illuminate both discrete work processes and information processes in the workplace, while preserving the naturally organized ways in which those processes are produced (Crabtree et al. 2001a). In this way instances support the production of design abstractions which are grounded in the actual organization of work. In all cases, the social organization of work may be analysed through the assembly of instances meeting the requirements of accomplishment levels one to three, whether the setting is small or large in scale (Christensen et al. 1998).

> administering them lose the very phenomena that they profess ... [The] immortal ordinary society evidently, just in any actual case ... is only discoverable. It is not imaginable. It cannot be imagined but is only actually found out, and just in any actual case. The way it is done is everything it can consist of and imagined descriptions cannot capture this detail.

Explanation – *imagining* in Garfinkel's terms or constructing generic analytic formats – cannot capture the lived work whereby workaday activities are put together and organized by participants in their collaborations. There is, then, a clear need to consider the lived, socially organized work of a setting in and of itself and not in other terms when studying Work and Organization for purposes of design, as it is this work that the accomplishment of Organizational objectives relies upon and that systems will inevitably be embedded in and change. Predicated on thick description, rather than generic analytic formats made up of *a priori* analytic categories, the studies of work programme is unique in its concern to explicate and represent the lived ways in which work is organized by parties to its accomplishment.[16]

2.3 Representing Cooperative Work

Rather than embed thick descriptions of work in the master narratives that make up generic analytic formats, accounts of the social organization of work might instead be made publicly available through the construction of instances as first segments of *Lebenswelt Pairs* (Crabtree 2001b; Garfinkel and Wieder 1992; Livingston 1987). The strong notion of Lebenswelt Pairs is derived from Edmund Husserl's Phenomenology (1970). Husserl was concerned to explicate the "genetic origins of independent Galilean objects" in coherent details of human praxis. By independent Galilean objects Husserl refers to things that exist independently of the individual; things that comprise the world 'out there'; things which are the objects of the sciences, and more mundane reasoning.[17] Husserl's injunction to take account of the genetic origins of independent Galilean

[16]It might be argued that the method of analysis outlined above constitutes a generic analytic format. This is not the case, however, for while it provides a general format for analysing and identifying the organization of cooperative work in a wide range of settings, it is content free. It provides no analytic categories with which to describe work, but instead instructs the analyst to attend to certain features of work in order to conduct description and analysis. Just what the organization of work will look like is not preconfigured, then, but left to the analyst to explicate by following the instructions. The problem of constructive analysis is thus avoided.

[17]It may seem strange to think of the objects of natural science (and mathematics) as having a genetic origin in human praxis. A momentary pause for reflection reminds us, however, that it is only in and through their collaborative work that scientists (and mathematicians) make their discoveries of independent Galilean objects. It is in this respect, then, that it makes sense to speak of independent Galilean objects being produced in, and recognized through, human praxis. The natural sciences are as much fields of practical action as anything else and subject to work study as such (Garfinkel et al. 1981).

objects is an injunction to return to the prescientific or pre-constructive analytic world (pre-analytic world for short) of real observable work whereby independent Galilean objects are produced and recognized. In calling for a return to the pre-analytic, Husserl argues that the scientist (natural or social) dresses up the objects of everyday life (be it the social organization of work or the phenomenon of natural science) in "a garb of ideas" or "symbols and symbolic forms" which are used to represent that world, to dress it up as "objectively actual and true". Husserl's is a call to suspend constructive analytic idealizations of the world, however, and to return to the "*vital practices*" through the accomplishment of which independent Galilean objects come to be produced and recognized in the practical actions of members in everyday life (including the actions of the scientist, natural or social). These vital practices are "forgotten" by the scientist – so much noise to be ignored and the vacuum filled with abstract principles of scientific method and constructive analytic accounts.

It might otherwise be said that independent Galilean objects do not simply exist 'out there' but are *potter's objects* made available to human beings in and through particular assemblages of work practice – assemblages that are reflexively productive of particular fields of human endeavour – of physics, maths, sociology, software engineering, searching in the library, and the rest. This is not to say that independent Galilean objects only exist as a result of human praxis, that human praxis casts and recasts the real world of things concrete. Rather it draws attention to what we already know but too often forget, namely that the real world of things concrete only exists *for human beings* as a result of human praxis, and as praxis changes so does our understanding of the real world of things concrete. Thus, independent Galilean objects are cultural objects through and through – objects which are accountably constituted in and through human praxis. Independent Galilean objects and human work practices are intertwined creatures, then, and it is recognition of this irremediable relationship that underpins the strong notion of Lebenswelt Pairs (Garfinkel et al. 1981).

Specifically, for any independent Galilean object, the first segment of a Lebenswelt Pair of segments – the instance – is a description of the lived work involved in the object's observable and reportable production and recognition (Garfinkel unpub. manu. 3). Thus, the strong notion of Lebenswelt Pairs situates description in discrete assemblages of materially embodied work practices, in contrast to abstract rules of method, bodies of ideas, formulae, formal structures, generic analytic formats, and other theoretical and metatheoretical formulations regarding the social organization of workaday activities (Lynch 1993). As such, instances may be viewed as

> Corrigible claims written as sketch accounts [which are to be] read praxiologically as first segments of lebenswelt pairs (Garfinkel and Wieder 1992).

Garfinkel (1996) elsewhere describes the significance of this statement as follows.

> In endlessly many disciplines, as local occasion demands, practitioners are required to read descriptive accounts alternatively as instructions ...
>
> The [Ethnomethodological] EM catalogue examines ... various ways in which an account ... can be read alternatively so that the reading provides for a phenomenon in two constituent segments of a pair: 1) the-first-segment-of-a-pair, which consists of a collection of instructions; and 2) the work, just in any actual case of following which somehow turns the first segment into a description *of the pair*.
>
> Call 2) the-second-segment-of-a-pair. Call the pair an *instructed action*, and call the work of reading a descriptive account, as related constituents of an instructed action, "praxiologizing" descriptive accounts.
>
> For both technologies of social analysis [Constructive Analysis and EM] ... *somehow* is key. Both CA and EM are preoccupied with ... empirically specifying praxiologizing's work. Both seek to replace *somehow* with an instructably observable *just how*. Each does so with distinctive policies and methods ...
>
> Characteristically, CA does the specifying job by designing and administering generically theorised formats ... EM does the specifying job differently ... [in describing the] haecceities that constitute ... the phenomenal fields of ordinary human 'jobs' ... as work-site specific practices of shopwork and shoptalk.

With praxiologizing's work we reach the nub of what the probative description of cooperative work amounts to and turns upon. As noted earlier, constructive analysis attempts to make the social organization of work instructably observable and thus publicly available through inference from generic analytic formats. In sharp contrast, in assembling instances as first segments of Lebenswelt Pairs, ethnomethodology attempts to make independent Galilean objects instructably observable through description of sequential orders of lived work and the unique work practices involved in that object's (e.g. filtering work's) actual production and recognition. Treated in the reading as instructed actions, the sequential orders of cooperative work practices described by the instance display the object and make it recognizable; the reader may go out and look and see 1) if the object exists and 2) if the description of its organization is correct. The recognizability of the object provides for the corrigibility of the account, which in turn provides for its validation.

Thus, the validity of organizational accounts is provided for *by practitioners* rather than by abstract *a priori* criteria specified by analysts who have neither encountered nor considered the particular job of work in question. Practitioners possess the practical know-how to produce and recognize the object described and may, therefore, concur with or *refute* its description. Probativeness turns on the description of the practical competence and expertise whereby membership is produced and recognized, then, in the craftful accomplishment of workaday activities, and not in abstract principles of method. The ethnomethodologically-

informed ethnographer's job is to represent that craft in coherent details of the unique work practices made visible in members' shopwork and shoptalk. It might otherwise be said that when investigating cooperative work in some setting and accounting for its organization, the ethnographer must set out to satisfy the unique adequacy requirement.

2.3.1 The Unique Adequacy Requirement

The unique adequacy requirement stands in direct opposition to the requirements of constructive analysis, as it excludes the use of preconfigured analytic formats. From an ethnomethodological point of view the analyst should be indifferent to claims made for the use of *a priori* methods (Lynch 1993) as the real world organization of work can not be identified through such methods nor can its existence be demonstrated in the established terms of normative studies of work (Garfinkel 1991).

> [T]he unique adequacy requirement ... is identical with the requirement that for analysts to recognize, or identify, or follow the development of, or describe phenomena of order in local production of coherent detail the analyst must be vulgarly competent in the local production and reflexively natural accountability of the phenomena of order he [or she] is 'studying'. We will replace the abbreviation 'studying' with the specific requirement that the analyst be, with others, in a concerted competence of methods [i.e., work practices] with which to recognize, identify, follow, display, and describe phenomena of order in local productions of coherent detail. These [work practices] are uniquely possessed in, and as of, the *object's* endogenous local production and natural accountability. (Garfinkel and Wieder 1992)

The insistence that the work analyst eschew normative methods (i.e., constructive analytic practices) and develop 'vulgar competence' in the cooperative work under study is an insistence that the analyst be able to recognize work practice as members recognize it in the first instance. In other words, it is an insistence that the analyst develop an intimate familiarity with the cooperative work under study such that they can *see the endogenous sense* of just what is being said and done, and in the ways that it is being said and done. This requirement sits uncomfortably with normative social science, which prefers to gloss over work practice and predicate organizational change on what ought to be given the ideological agenda of the day. The simple fact remains, however, that appropriate organizational change cannot be implemented if the object of change is not explicitly and adequately understood in the first instance (Sharrock 1980). With an eye towards implementing appropriate organizational change through technology design, the development of a vulgar competence in the work practice under study enables the analyst to deliver an account of the social organization of work in coherent detail – i.e., an

account that is intelligible to competent members or practitioners and which may be corroborated by them.[18]

An example may help the reader to appreciate the fundamental importance of developing vulgar competence in work practice in order to satisfy the unique adequacy requirement. Paul ten Have tells us of the following study:

> A few years ago, in a data session in Amsterdam, we were discussing some materials on a medical consultation's diagnostic phase. The patient voiced a number of complaints and we felt that the physician was not taking some of these up. One of us, however, Charon Pierson, of the School of Nursing of the University of Hawaii and a student and collaborator of Britt Robillard, used her professional expertise to point out that some of his subsequent questions were motivated by some of the complaints we thought he did not attend to. In other words, from a professional perspective, he was working on those complaints, but this was not noticeable for us, non-medical overhearers, and indeed for the patient. So from a Conversation Analytic perspective, we could understand some of the patient's repetitions of her complaints as dealing with 'notable absences' on the doctor's part, while we were not getting the fine details of his 'diagnostic work' qua professional practice. (Email communication cited in Crabtree 2000b)

Charon Pierson was, and is, vulgarly competent in the work practice under study, that's why she could hear and otherwise recognize what was going on and why the other analysts could not (or rather, could only recognize that aspect of the work that fell under their competence as ordinary members of society; competence they themselves exercise when assuming the patient's role). Developing competence in the work under study is as indispensable to the work analyst as it is to the member.

Although generic analytic formats are eschewed as a means of describing, analysing and representing workaday activities, the unique adequacy requirement does not rule out the need for specialized methods. Such methods will be specialized, however, in the sense that they belong to the workaday activities in question rather than the analysts' arsenal. The adequate description, analysis and representation of the diagnostic phase in medical consultation, for example, will involve specialized methods of description as it is through such methods that its phenomena (e.g. cerebral palsy, Parkinson's disease, autism, etc.) are detected and made visible. It just so happens that the work practice addressed here (filtering work in the library) requires no specialized competency or the mastery of special methods in the same way that medical diagnosis does in order to understand what's going and what's being done. No one needs a higher

[18]Corroboration may be conducted by presenting studies to members/users or, alternatively, by conducting end-user experiments on prototypes based on work studies and designed to support members' work-practices. This latter method may be more useful to design as it engages the real experts in work's accomplishment in direct analysis of the design space. See Chapter 4 for further details.

degree, for example, to do filtering work or a great many other workaday activities. This is not to say that filtering work (etc.) does not require a special competency – it does, ordinarily so. Indeed, it is the *ordinary expertise* implicated in the accomplishment of filtering work that makes it readily intelligible to a great many of us, as a great many of us have had recourse to engage in that work; we are masters of it. The notion of vulgar competence should not be understood, then, as making a distinction between 'ordinary' activities (such as finding a book in a library) and 'specialized' activities (such as conducting medical diagnoses) but as referring to an unrecognized and essential competence which consists of the mastery of the methods or work practices for getting the workaday activities in question done.

Vulgar competence is constitutive of membership in *all areas* of practical action, is everywhere taken for granted, and as a result is systematically ignored by the social sciences. Nonetheless, the requirement to develop competence in the work practice under study is essential to accurate ethnographic reportage as it provides a solid basis for writing praxiological accounts, which may be analysed with an eye towards grounding design in concrete use practices. In order to achieve that goal the analyst needs to become part of the phenomenal field of practical action that constitutes their object of study. 'Become part of the phenomenal field' means if the work analyst is to explicate the real world, real time social organization of work in a setting then they need to immerse themself in the work of the setting – administering compliance documents (surveys, questionnaires, structured interviews, etc.) and generic analytic formats will not do. 'Immersion' means that the analyst must learn and thereby gain an adequate mastery of the day-to-day work of the setting as a condition of their studies. 'Adequate mastery' means that the analyst can recognize as members recognize *what* is going on in the phenomenal field of practical action under study and *how* it is getting done. In such a way the analyst might develop a vulgar competence in the object of study (such as filtering work) and may, as such, undertake the writing of praxiological accounts (sketches of cooperative work and its real world, real time organization) which may be verified by members and used to inform design.

2.3.2 The Particular Need to Transcend Generic Analytic Formats

The break with generic analytic formats makes members' methods or work practices the exclusive topic of analysis, in contrast to abstract structures, processes, networks, etc. Normative social science has reacted wildly to this 'radical' approach to the study of work, abandoning reasoned dialogue on occasion in favour of indignant objections and sarcastic caricatures (Coser 1975). More composed reactions contend that it is not enough to attend to work *in situ* if one wishes to understand its

organization. If we are to understand the organization of work then we must understand the wider social, political, and economic context of work (Giddens 1978), and so generic analytic formats are said to be indispensable to the work analyst. Even a brief consideration of the general character of generic analytic formats suggests otherwise, however.

Take Marx's generic analytic format, for example, a widely known format that addresses the social, political, and economic context of work. According to this format, work is organized in terms of the 'forces of production'. The forces of production consists of 1) the 'means of production' – i.e., the raw materials (land, minerals, livestock, etc.) of production and the technologies of production (be it stone axes, steam engines, or computer systems); 2) the 'relations of production' – i.e., the social relationships which tie together people in the act of production (such as slave labour, feudal tithes, wage labour, etc.); and 3) the 'process of production' – i.e., the concrete mode of production produced through the combination of the means and relations of production (e.g. feudalism, capitalism, communism, etc.). Employing this generic analytic format to analyse the organization of work in his own time, Marx observed that capital production is characterized by the appropriation of the profits made from the products of one group's labours (the workers) by another group (the owners of the means of production). Thus, the organization of work in capitalist societies is characterized as being fundamentally exploitative, with one group gaining at the expense of the labours of the other. Furthermore, it is predicted that this state of affairs will inevitably 'alienate' the labour force, producing social tension and conflict that will propel positive change in the structure of society in the longer term – change that may be all the more rapidly promoted in making members aware of the exploitative conditions of their existence.

Whether one agrees with or wishes to dispute Marx's analysis of capitalism or the formulation offered here, that would be to miss the point that formulations of work organization produced through the construction of generic analytic formats inevitably fail to address work in the particular. 'Work', it should be noted, is a gloss on an almost infinite array of *different* practical activities. Generic analytic formats ignore difference, however, describing work everywhere in the same theoretically configured ways. The diverse organizational character of workaday activities simply cannot be accounted for by generic analytic formats and so it is evident that such formats are far from indispensable to the work analyst but are instead, hugely problematic. As Button and Harper (1996) put it,

> theoretically generated formulations that typify the 'sociology of work' at large fail to address the details of how that work is 'put together', or organized in the actions and interactions of those who perform it as a real time phenomena. Thus Marx's description of alienation refers to work *per se* in capitalist society and has nothing to say about the way in which recognizable categories of work are assembled in the real time actions and interactions of workers.

Recognition of the inability of generic analytic formats to deal with the social organization of work in the particular have led to the suggestion that the studies of work programme might support a remedial exercise. The ambition here is to sensitize normative social science to "core practices of occupational worlds" and to render them "into objects suitable for treatment in the accounting practices of professional social science" (Heritage 1984). However, Garfinkel (1996) eschews any attempt to marry the empirical enterprise with constructive analysis.

> There have been authors of ethnomethodological studies whose reputations were promoted by offering to the members of the worldwide social science movement ways of upgrading their craft. "Your science is cockeyed. We need to sit down and diagnose for you just where you're going wrong." Ethnomethodology has yet to deliver promised repairs to [constructive] analytic social science enterprises without losing its own phenomena ... [This is not to say that EM] has no concern with a remedial expertise and has nothing to promise or deliver. Ethnomethodology *is* applied ethnomethodology. However, its remedial transactions are distinctive to EM expertise.
>
> That expertise is offered for phenomena whose local, endogenous production is troubled in ordered phenomenal details of structures. EM does *not* offer a remedial expertise that is transcendental to these phenomena. In these the generality of EM's remedial expertise is indifferent to (independent of) the use of policies of generic representational theorising and methods of constructive analysis

To cut through Garfinkel's complicated locution, studies of work offer a remedial expertise to occupations which need, for problematic reasons, to appreciate the social organization of work in real world detail. Systems design is a primary but by no means exclusive example of a 'troubled' occupation in its efforts to appreciate and be more responsive to the social circumstances of system usage (Grudin 1990b; Goguen 1993). Studies of work do not offer remedial expertise to constructive analysis, however, for the reason that the two approaches to analysis are asymmetrical and incommensurate or mutually exclusive (Garfinkel and Wieder 1992). There simply is no middle ground between the two; the analyst either describes the organization of work abstractly in general theoretical details that are incidental to the work of the site, or concretely, in recognizable details of the real world interactions and collaborations that make up and organize the work of the site. Insofar as the work analyst is concerned to inform the development of collaborative computing systems that are compatible with the actual circumstances of their use, the latter course of description, analysis and representation is a defensible course to take.