Qualitative Research and Hypermedia

Ethnography for the Digital Age

Bella Dicks, Bruce Mason, Amanda Coffey & Paul Atkinson
Qualitative Research and Hypermedia
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Introduction: Qualitative Research for the Digital World

The everyday social worlds in which qualitative researchers and ethnographers move are pervaded by digital technologies. We are surrounded by music and other sound that is recorded and reproduced by digital means. Music can be downloaded from the internet. Music and speech can be recorded onto minidisks. Digital photography is rapidly displacing film photography for many amateur enthusiasts, as well as for many commercial applications. Digital camcorders are within the price range of many, and recordable DVDs and DVD rewriters are now widely available for today’s PC user. Digital television and radio are increasingly taken-for-granted as everyday technologies. These digital sources of reproduction and representation, coupled with the power of the ordinary desktop or notebook computer, make remarkably powerful and flexible methods available to the average consumer for capturing, storing and distributing information.

Qualitative researchers and other social scientists have not been indifferent to these new technologies. The capacity of the internet means that it is increasingly feasible to reach otherwise ‘hard to reach’ people, often on a global basis. Sociologists, anthropologists and other cultural analysts are increasingly documenting the everyday realities of social actors whose social relationships are mediated by and through the internet. The internet has itself created various kinds of ‘virtual community’, who not only exist in ‘cyberspace’ but can be studied via the internet itself. Social movements can be mobilised and studied through such global technologies. The power of digital communication world-wide is itself a potent factor in the processes that social scientists study under the rubric of globalisation.

Qualitative research has, from its earliest years, exploited the available technologies. This has been particularly the case in the field of ethnography. Overseas anthropological fieldwork in exotic locales was recorded photographically from its earliest inception, and ethnographic film has a long history. Oral narratives were collected from the earliest days of sound recording. In recent years the proliferation of ethnographic research has been reflected in the use of a wide variety of techniques and technologies.
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Visual anthropology and sociology have emerged as subfields in their own right, with their own methodological literatures. We have become so accustomed to the collection and analysis of spoken language that it is easy to forget just how recently such work has become possible, thanks to portable, good quality recording equipment (first analogue and then digital). The collection and analysis of visual data, the collection and analysis of spoken materials, the photographic representation of material culture – these are all enhanced by the increasing availability of high-quality, unobtrusive digital recording technologies. There certainly remain further, yet untried opportunities for the exploitation of digital technologies for the purposes of qualitative research.

The personal computer is a relatively recent technology. When personal computers first became part of the academic working environment, and elementary software for handling texts became available – either commercially or as free shareware – there were many established practitioners in sociology and anthropology who were highly suspicious of applying the emergent technology to ethnographic materials. People felt that any attempt to use computers to ‘analyse’ ethnographic field data, such as field-notes or interview transcripts, would inevitably be far too mechanistic, too reductionist and too narrow ever to prove satisfactory supplements to the conventional methods of interpretation, close reading and manual indexing. Many felt that the computer would prove a barrier to thorough understanding of qualitative data, rather than an aid. Academics are now so accustomed to wordprocessing their texts, communicating by email and so on that the personal computer is an indispensable and taken-for-granted tool. While there may remain serious methodological issues to be resolved about the unreflexive use of computer software for analysis, the vast majority of researchers now take for granted the legitimacy of computer-assisted qualitative data analysis. Training courses in the software are regularly over-subscribed, and the commercial development and distribution of such software continues to flourish.

It is our belief, however, that qualitative researchers have still not made the best uses of technology. We do not subscribe to technological determinism, and we do not believe that the thinking of social scientists is or should ever be driven by a search for technological fixes. Clearly there are no simple machine-driven solutions for many or any of the demanding tasks involved in undertaking fieldwork, analysing data and writing and representation. However, we do believe that social scientists can and should explore what new technologies can do for them and their research. Just as new digital technologies can allow us to do new things with sound and vision in our everyday lives, so it may help us to do new things with our social scientific data.

At various times in the course of their careers, or in the midst of research projects, researchers can often face seemingly intractable problems of managing their data and organising them into adequate representations of the social world they wish to document. In the first place, there always seem to be too many data. When anthropologists, sociologists and others talk about the ‘richness’ of field data, this can be another way of expressing the sheer volume and complexity of information they collect and store. Extended periods of field research can yield tens of thousands of words of written text – transcribed interviews, fieldnotes, and documentary sources. These are often
accompanied by numerous images, material artefacts, and other memorabilia. It is a daunting task to manage all those materials and bring them together into some kind of coherence. Moreover, the researcher has to transform these materials into quite distinct forms of representation – usually a research monograph and academic papers (although film and photographic displays may also play a role).

Now the social world, captured – albeit imperfectly – through multiple sources and media, does not present itself in neatly framed narratives and themes. The field researcher encounters social worlds that are enacted simultaneously in a variety of different modes – linguistic, visual, gestural, material and so on. These worlds will not stop still in order to reveal themselves in these separate strands. We collect field data in multiple ways, for data are rather like the raw materials for a montage, as opposed to being strung out into a simple text. Social worlds do not have beginnings, middles and ends: they are going concerns that present us with a multiplicity of information, representations and ideas. It will always remain the task of the researcher to make sense of her or his data. However we no longer have to ‘lose’ most of these data by selecting out only the tiny fragments of knowledge and information we are able to include in published reports, leaving most of the data in an archive or inaccessible altogether. We can start to think about digital information technology in order to store and manage large and complex sets of data. Further, we can start to think creatively about the capacities of digital technology to enable us to explore, analyse and represent those data in creative ways.

Qualitative researchers – novice and experienced alike – may often wish that they could present their readers with a rich corpus of empirical materials to assimilate – like a vicarious fieldwork experience – so that they (the researcher) could then write different analytic discussions about it. The constraints of conventional textual formats – such as higher degree theses, printed books and journal papers – can often seem especially irksome to authors who want and need to (re)present large amounts of information that have complex forms of order and pattern, where the detail matters, and where variety or repetition of motifs is significant. The resources of contemporary digital information technology may allow us to approach these interests and desires in more creative ways.

We are not intending to be prescriptive by insisting that what we present and discuss in this book is the way forward for qualitative analysis and authoring. But it is certainly one way. Hypermedia techniques – our experience of which we introduce in this book – can be used to facilitate simultaneously the analysis and the authoring of fieldwork material. We believe that hypermedia represents one way of introducing genuinely new ways of using digital technologies. It goes well beyond reproducing the kind of analytic strategies that have in the past been performed manually. It also starts to exploit digital technologies to create new ways of producing and writing about our research. The technology is not, therefore, intended merely to store, manage, annotate and retrieve data that are then imported into a different kind of technology (the printed word). Using hypermedia resources, one can create complex, multi-faceted accounts that are themselves computer-based.

Virtually everybody who uses a computer today will have encountered hypertext. Simple and robust hypertext links are used to navigate through and between sites on
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the World Wide Web. Hypertext is 'clickable' writing: through selecting highlighted or underlined items on-screen the user can jump to different screens, and thence onto others still, tracing personalised paths in the search for the information she or he is after. Hypermedia software allows us to 'journey' in the same manner, but in this case using multiple media – not just written text, but also sound, video, images, graphics, or documents. It allows the analyst to create complex linkages within data sets, and across data sets. It allows one to link analytic commentaries, methodological reflections and theoretical speculations with data. It allows for different layers or levels of complexity and sophistication in the analysis: one can have introductory and advanced explorations of 'the same' piece of research. Moreover, the 'reader' can also use hyper-linking to create her or his own pathways through the 'electronic writing space' (Bolter 1991) that authors have constructed. Indeed, there is no longer just one authored text: in principle there become multiple potential texts, with multiple potential authors.

These are, we believe, exciting possibilities. They are by no means new in the world at large. There have been hypertext novels and other computer-based hypertexts for some time. The digital technologies are themselves well established. The use of these technologies in commercial contexts is advanced, while the basic technologies are available in high-streets and shopping malls throughout the world. Hitherto, however, qualitative researchers have not spent a great deal of time and energy exploring their potential for their own academic purposes. Few of us have the luxury of being able to experiment with new technologies primarily for methodological purposes. We have been fortunate in having that luxury. Supported by successive research grants from the UK Economic and Social Research Council, we have been able to explore the development of hypermedia techniques for several different research projects.

We intend to demonstrate in the course of this book some of the exciting possibilities for qualitative research that are opened up by digital techniques. We shall describe how we have set about creating a hypermedia environment for analysing and authoring our own social research. We shall also explain how digital technologies impact on the research process at the earliest stages – from specifying the 'field' to observing and documenting it. This book is, therefore, grounded in our own practical experiences in this area. We describe how these methods have been and can be implemented. This is work that continues. Just as the new digital technologies continue to develop, and go on suggesting new ways of managing data, so our own approach continues to develop. But we describe here one working environment for the creation of hyper-ethnography. It is, we hope, an approach that others will follow, or critically engage with, and there will undoubtedly be further refinements to be introduced. For the moment, we present some first steps towards an ethnography for the digital age, in which new technologies are exploited to the full for the purposes of social research that is sensitive to the many and varied ways in which the social world can be captured, explored, analysed and represented.

Note: Our own work is characterised by a sociologically-informed ethno-graphic approach (see Hammersley and Atkinson 1983). Consequently, in this book we most
often refer to our enterprise as ethnography and ethnographic research. We contend that many, if not all, of the theoretical, epistemological and methodological debates that have lain at the heart of ethnography in recent years are also germane to the wider domain of fieldwork-based qualitative research. This book is therefore intended to be useful for all those (academic and non-academic) researchers who are working within the qualitative, interpretative traditions of empirical social research.
This is an especially exciting time for social scientists to be working, not least because of the methodological developments that have taken place in recent years. Research methods in general have been undergoing both revision and expansion. In particular, varieties of qualitative research methods have become increasingly pervasive within the social science and cultural disciplines. Ethnographic fieldwork, the analysis of visual data, the collection of life-histories or personal narratives, and the conduct of multiple varieties of interviews have all become part of the varied repertoire of qualitative social research methods. Where twenty years ago the methodological literature on qualitative research methods was somewhat sparse, the field is now replete with both general methodological texts and specialised accounts of particular research strategies. While the centrality and sustained growth of qualitative research cannot be doubted, it does not, however, present a unified array of orthodoxies. There are multiple claims and justifications for qualitative research, appealing to different intellectual traditions, philosophies and epistemologies. Qualitative methods located within symbolic interactionism, urban ethnography, social anthropology and community studies have been joined (superseded according to some) by contemporary appeals to postmodernism, cultural studies, hermeneutics, feminisms, critical race theory and other standpoints.

At the same time as we have seen this explosion of qualitative approaches to social research, information and communication technologies (ICTs) have also developed at an extraordinary pace. The power of the personal computer has expanded enormously over the past two decades; internet communication has become a routine feature of everyday life as well as academic work; digital imaging of various kinds is now widely accessible; digital recording is fast replacing analogue recording of speech, music and action. The overall effect of these and other transformations is to create a digital environment in which multiple types of information can be captured, stored, retrieved,
edited and distributed in highly versatile ways and with considerable speed. Storage capacity in digital formats means that the sheer volume of information that can be managed has increased exponentially. The net effect is that home-entertainment and everyday communication – to say nothing of professional work in the communication, media and information-processing industries as well as in academia – represents an extraordinarily sophisticated array of digital technologies.

The opportunity now exists for social scientists to exploit these possibilities of digital technology – to extend, enhance and even to reconfigure their research techniques. For qualitative researchers, multiple possibilities arise for an expansion of techniques to reflect on and incorporate digital technologies into their methods for data collection, storage, retrieval, analysis and authoring. The work that is reported in this book explores some of these possibilities, and takes as a starting point the premise that social scientists working in various qualitative modes might develop (more) innovative ways to use ICTs to promote new ways of (re)conceptualising and conducting their work. It is our contention that qualitative researchers have not exploited the full potential of digital technology thus far. Ethnographers and other qualitative researchers have, more often than not, used the available technologies essentially to replicate research that reflects rather limited strategies rather than exploring ICTs to their fullest possible extent.

This book, and the work that underpins it, reflects a process of ongoing methodological development. It reflects a long-standing commitment to methodological innovation on the part of the Cardiff ethnography group, whose various members have made substantial contributions to the literature of qualitative research methods. Specifically, this book draws upon three successive methodological research projects (all supported by the UK’s Economic and Social Research Council¹), that have pursued a consistent line of methodological experimentation.² In this first chapter we provide a brief recapitulation of the ideas and developments that have informed and continue to inform this work. The issues that we outline are returned to and further explored in the subsequent chapters.

**Early experimentation**

Two decades ago the use of computing for the management of ethnographic or qualitative data was something of a rarity. Indeed, it was regarded with some scepticism. Practitioners were not convinced that the nuances and subtleties of ethnographic research could be represented, let alone enhanced, by the use of computer-based technologies. In some quarters, at least, the use of computer techniques seemed to smack unduly of research strategies inimical to the spirit of ethnographic inquiry and scholarship. Such techniques became rather crudely associated with attempts to impose spurious forms of ‘rigour’, such as the derivation of quasi-statistical measures from qualitative (usually textual) data such as fieldnotes and interview transcripts. It was also felt to imply unduly ‘positivist’ techniques by imposing overly rigid categorisations
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upon the complexity of field data. Finally, it was felt by some that the introduction of computing techniques would interpose an unhelpful technology between the author/analyst and her or his ‘data’. More sophisticatedly, perhaps, others suggested that the use of computing techniques implied inappropriate ideas as to what those very ‘data’ consisted of. One should, it was thought, regard them as open and provisional texts, available for interpretation, but not as the equivalent of ‘hard’ data that were inertly available for aggregation, comparison, indexation and codification.

Within the space of just a few years, however, desktop (and laptop) computers had become so commonplace, and the wordprocessing of field data or interview transcripts had become so taken-for-granted, that the use of computing software to manage textual data came to be seen as somewhat less problematic. In consequence, what has become known as Computer Assisted Qualitative Data Analysis Software (CAQDAS) was increasingly recognised as a growing field of expertise within the general area of qualitative research methods. As part of this development a number of individuals and groups developed a variety of applications designed to support qualitative research.3 (Indeed it is testimony to the burgeoning influence of qualitative research that so many packages have since been developed.) Early applications included software for use with personal computers (PC), Macintosh computer (Mac) and mainframe computers. Among the early resources were The Ethnograph (PC), Qualpro (PC), Textbase Alpha (PC), Kwalitan (PC), Hyperqual (Mac), Hyperresearch (Mac), Hyersoft (Mac), NUD*IST (mainframe, PC and Mac) and Qualog (mainframe). There were in addition numerous generic applications that had varying degrees of relevance for the management of qualitative data, including various indexing, wordprocessing and key-word programs. Indeed Cardiff saw one of the earliest experiments in the field. Before all the early commercial applications were available, Paul Beynon Davies developed a prototype program for the categorisation and retrieval of qualitative data (Davies 1984).

By the early 1990s there was a new generation of software available, and more in the process of being developed. There was (and indeed remains) considerable overlap in the functions provided by various programs, although there were also key differences. A need for careful review and comparison quickly emerged. Nigel Fielding (1993) noted the need for evaluation, suggesting that a researcher considering a particular package for a particular project needs to take into account the particular analytical work that the software facilitates (and indeed the kinds of work that it will not enable the researcher to undertake). Moreover, different software packages will ‘speak’ to analytical procedures advocated by different research traditions. The growing sophistication of the software was not necessarily matched at the time by the sophistication of the research community in exploiting the full range of possibilities. Moreover, as Fielding noted, there was a danger that a relatively uninformed adoption of one or other software package might actually hinder rather than help methodological development.

Many qualitative researchers believe that the use of software poses a threat to the craft-skills of a long-established research tradition. There is a perceived danger of superficial
analysis produced by slavishly following a mechanical set of procedures. There is also a
more profound concern, that the existing software contains an implicit theory of qualita-
tive analysis, one that is not conducive to the full range of analytic postures customarily
found in this eclectic field. Insofar as existing software presumes a generic theory of qual-
itative analysis, it largely relates to the conventional, but by no means universal, grounded
theory approach. (1993: 5)

As Fielding indicated, the uncritical adoption and implementation of particular CAQ-
DAS packages – or indeed the wholesale endorsement of the approach – could commit
researchers to the implicit adoption of particular research strategies. Equally, the mecha-
nistic use of CAQDAS could engender a sceptical attitude on the part of other scholars.
The earlier years of software development and implementation were accompanied
by a number of significant publications that introduced and reviewed qualitative data
analysis software (for example Agar 1983; Brent 1984; Brent et al. 1987; Gerson 1987;
Heise 1988; Lee and Fielding 1991; Pfaffenberger 1988; Tesch 1990). The contribu-
tion of the late Renata Tesch deserves particular mention: her book was enormously
influential in bringing the possibilities of CAQDAS to a wider audience of researchers
and students. There remained, however, a pressing need for a systematic and critical
review of the methodological implications of computer applications. While software was
being developed and disseminated in the early 1990s, there was relatively little attempt
at systematic comparison and review of the applications, together with a thorough and
critical analysis of the methodological underpinnings. Hence an appraisal of these
complementary or contrasting computer strategies was not readily available, and prac-
titioners tended to limit their experience (and evaluation) to single applications.
Moreover, the texts that had began to critically evaluate CAQDAS tended to con-
centrate on the functions and operations of particular packages (quite properly), rather
than exploring the generic and future possibilities (see Tesch 1990; Fielding 1993).

This prompted a project (based at Cardiff in the early 1990s), devised to address the
particular methodological issues of CAQDAS, through a systematic comparison of a
variety of strategies for the computer-assisted analysis of qualitative data (Weaver and
Atkinson 1994). Unlike the majority of commentaries in this area, this project was
grounded neither in one particular software application nor in a primarily empirical
piece of research. The project was designed entirely in methodological terms, and was
aimed at critical reflection on the methodological implications of various approaches.
The core of the project therefore consisted of a systematic review of computing strate-
gies rather than a comprehensive review of all the available software. Anna Weaver
worked with Paul Atkinson on the project. She was responsible for all the practical
work with the data and the software. Moreover, her understanding of the research
processes became a crucial resource in the development of the methodological research.1

In contrast to the various ‘consumer guides’ that were available (such as Tesch 1990), it was a particular feature of this first Cardiff project that the software being examined was applied to the same data set. This rested on a belief that in order to examine the implications of different analytic strategies, they should be applied simulta-
naneously to the same set of materials. The majority of users, in contrast, only had
experience of using one application on one (usually their own) data set. It is inevitable that a research project and an investigator’s familiarity with the software grow together, leaving the majority of users with little or no critical distance from which to conduct a broader critique. By working with different computing strategies on one data set Weaver and Atkinson were able to concentrate on the processes of data analysis rather than specific substantive outputs; and on the general methodological consequences of those analytic strategies rather than the detailed documentation of one or other software product. Weaver and Atkinson therefore based the project on a pre-existing set of qualitative data.

The project used field data collected by Julius Roth in the course of his research on social relations in tuberculosis (TB) sanatoriums. Roth’s study is well known as a classic example of a sociologist turning personal adversity to professional advantage. Having contracted TB he kept a journal of his experiences as an in-patient. He also undertook a period of fieldwork as a full participant, employed as an ‘attendant’ in a hospital. He also undertook fieldwork as an overt researcher. Roth’s research served as a valuable case study, in that he published a monograph (Roth 1963) and a series of papers about his field experiences. In addition, he made copies of his field data available to scholars for methodological purposes. In this methodological project the fieldnotes from Roth’s time as an attendant were used. The notes were wordprocessed into text files – one file per day of fieldwork – and transformed into ASCII files, ready to be imported into alternative software applications.

While Roth had published extensively, it was a particular feature of the methodological project that the data were approached afresh. In particular the research team had no particular investment in any ‘findings’ that might be derived from the data set. And while Atkinson was familiar with the data and the published work, Weaver was new to both. It was thus possible to approach the storage, retrieval and analysis of the data as a set of new technical and methodological tasks. While Atkinson was familiar with a broad array of potentially useful ‘foreshadowed problems’ in approaching the data, Weaver was able to approach them with an entirely open (though by no means empty) mind. Substantive issues could be relegated safely to methodological considerations.

There are, of course, attendant problems inherent in such a strategy. By and large, fieldnotes are rarely constructed with the interests of secondary analysis in mind. Even when – as in this case – authors are willing to share them with a wider intellectual community, the data themselves reflect their original composition as fieldnotes constructed for subsequent use by their author. It is not unknown for scholars to undertake a secondary analysis of qualitative data of others and the problems of such work have been documented (Heaton 2004). Here is not the place for us to comment in detail about the interpretative problems involved in such a secondary analysis, or to pass judgement on the adequacy of the data themselves. Suffice it to say that the (re)animation of a ‘cold’ or ‘inert’ body of field data is by no means straightforward.

The methodological gains of temporal and personal distance from the data were to some extent offset by the lack of personal, tacit knowledge about the social setting and actors in question. Field data (any data) can never provide an exhaustive description.
or account of the social action and its contexts. In most ethnographic research, the analyst and the field researcher are one and the same (or members of the same team) and personal knowledge can be drawn upon. In the course of this project the data had to speak for themselves, while at the same time it was recognised that the field-notes were but a partial reflection of the social setting they described, and also of the research process itself. It meant the adoption of an essentially inductive approach to the data.

This project did not attempt to review all of the software that was available at the time. Rather it concentrated on mapping and evaluating underlying strategies for data management and analysis. Thus it was possible (and essential) to set a number of limits on both the computing environment and the software. Thus this essentially meta-analysis was undertaken on PC machines only and in an MS-DOS context. This decision reflected the university computer environment at the time and the fact that the majority of users in the UK used PCs. It was, therefore, a pragmatic decision rather than a reflection of any profound evaluations or prejudices concerning computing environments per se. In the succeeding years, of course, these decisions and distinctions have become of less relevance, as platforms have changed and converged, and in any case, the successive versions of the Windows interface has changed the environment for most users.

A significant aspect of the project was the systematic comparison of two contrastive analytical procedures, located within the available software. These were code-and-retrieve (explored using bespoke CAQDAS programs), and hypertext applications. The core, representative software package used to exemplify the code-and-retrieve approach was *The Ethnograph*. At the time it was probably the most widely used and best documented among the family of similar applications. Moreover, the 'coding' of data, using such software, had become almost synonymous with CAQDAS, in some quarters at least. At the time NUD*IST was just beginning to make its mark (and indeed it might now be argued that this may now be a better representative package). NUD*IST was also explored during the project, as was Kwalitan – a package written explicitly to reflect the procedures and principles of grounded theory (Glaser and Strauss 1967). Unlike *Ethnograph* and NUD*IST, Kwalitan did not become commercially supported and widely available.

Although these applications had a number of differences, the versions available at the time were based on one core set of functions. They relied on the 'coding' of segments of textual data (such as interview transcripts), and the retrieval of coded segments. They offered considerable advantages over manual indexing and searching. The search routines permitted very rapid and comprehensive searching of the data. They also allowed the analyst to construct complex searches by retrieving data segments with multiple or overlapping codes. Kwalitan and NUD*IST were also designed to go beyond the somewhat elementary coding procedures associated with *Ethnograph*. They were based on a more thoroughgoing representation of grounded theory, and were designed to facilitate theory building rather than just the mechanical tasks of coding and retrieving segments of textual data.
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As we have already noted the project compared code-and-retrieve with a ‘hypertext’ strategy. This can imply a radically different approach not only to the analysis of qualitative data, but also to its representation (not something really addressed by the code-and-retrieve family of programs). At the time, hypertext appeared to stand at the opposite end of the spectrum of analytic approaches from packages such as The Ethnograph. To exemplify hypertext there was rather little to choose from for an MS-DOS environment at the time. Guide, a commercially available hypertext program, was thus selected for illustrative and exploratory purposes, and implemented with some success. It is not appropriate here to provide a detailed account of the outcomes of the project (see Weaver and Atkinson 1994 for a full description). However, some of the key observations are worthy of note, as they help to set the scene for the subsequent methodological project that is reported upon in the main body of this book.

Code-and-retrieve

The Ethnograph was a software program dependent upon a familiar notion of coding. Code-words were attached to segments of text (identified by line-numbers marking the start and end of each coded segment) and then used to search the data files in order to retrieve segments identified with the same codes. The underlying logic was essentially based on the manual procedures developed before the advent of microcomputers; where data were once physically disaggregated by literally cutting up hard copy and distributing the fragments to physical files or marked and indexed in some way within the continuous record. The analytic logic remained one of ‘decontextualizing’ and then ‘recontextualizing’ segments of data (cf. Tesch 1990). That is, the fragments were detached from the other data in which they were originally embedded, and relocated in analytic files or categories. Software such as the Ethnograph did (and still does) rather more than just the copy-and-paste function (which can be achieved by most good wordprocessing packages). Such software facilitates multiple coding of segments; codes may overlap and may be nested within one another. Segments may be retrieved using single or multiple searches (for example according to the co-occurrence of two or more code-words). In principle, therefore, packages such as The Ethnograph allow codes to be combined in an approximation of Boolean logic in order to facilitate complex search-and-retrieval procedures. A strength of such a program thus inheres in its ability to perform logical operations and quasi-statistical analyses of the codes.

Within this particular project, a dense and comprehensive coding of the data called for a careful design and implementation of a coding scheme. Analysts using a code-and-retrieve strategy need to spend a considerable amount of time devising and experimenting with codes relevant to their own data. The coding approach calls for a considerable investment in preliminary analyses, if codes are not to be devised and added in an ad hoc fashion. Useful searches of the data can only be facilitated if the coding scheme is adequate in the first place. The software packages that were reviewed certainly allowed the analyst to change, delete or add codes, and thus in theory the
processes of coding and recoding can follow the emergence of ideas grounded in data. However, the tasks of entering and deleting codes can be laborious and tedious, and there is a strong suspicion that in many projects, coding schemes can easily become fixed once the data have been worked through and coded for the first time. Rather than promoting flexible analyses and emergent ideas – as advocated under the rubric of grounded theorising, for instance – software like Ethnograph may have the unintended consequence of promoting a somewhat static approach, in which both data and codes become frozen.6

It became apparent in the course of this methodological exploration that the creative and exploratory work of analysis was likely to be most characteristic of the early stages of manual coding and the reflection implied thereby. Once the data had been coded and the codes entered into the relevant program, there was little further insight or ‘discovery’ about the materials. In itself the earlier versions of The Ethnograph software were restricted in representing relationships between codes. In essence, the coding strategy thus facilitated was an essentially ‘flat’ one. NUD*IST was based on a rather different approach, in that it was predicated on the principle that codes should be systematically related to one another. Codes were thus related by being located within hierarchically ordered trees. Codes and the concepts they stood for were therefore supposed to be part of a set of semantic relationships. This ordering of codes and concepts reflected the kind of theoretical development that NUD*IST was intended to support.

The retrieval of coded data is not problematic in itself. Indeed, it is a mechanistic exercise and not primarily an analytic process. Atkinson and Weaver found that the creative work, and the ‘discoveries’ about the data took place at the initial coding stage. The detailed practicalities of coding undoubtedly resulted in a comprehensive and detailed reflection on the structure and content of the data. The need to construct an adequate coding scheme forced a careful consideration of how best to represent emergent ideas, and a heightened awareness to possible relationships between categories. To that extent, therefore, the software facilitated the swift and comprehensive searching of the data. It also encouraged a thorough exploration and reading of the data. However it was difficult to argue that it offered any conceptual or analytical advance over manual approaches. The Ethnograph did facilitate some aspects of what might be described as grounded theory data handling. It emulated manual searching very efficiently and more comprehensively. However, its version of coding recapitulated what Atkinson (1992) called ‘the culture of fragmentation’ as a general approach to qualitative data analysis. That is, it reflected an implicit assumption that data reduction and aggregation lie at the heart of the task. This can readily lead to a quasi-positivist version of qualitative data analysis. The implicit model of coding it draws on is by no means identical to that advocated by proponents of grounded theory, such as Anselm Strauss (Glaser and Strauss 1967). However, it must also be acknowledged that Strauss himself seemed to have embraced a rather more mechanistic view of coding in some of his later writing (see Strauss and Corbin 1990 and 1994; also see Glaser (1992) for a vigorous denunciation).
A conclusion from this first Cardiff project was that the underlying logic of categorising and coding qualitative data, as exemplified in many of the bespoke software packages of the time, was a rather limited approach to combining qualitative data analysis and computer technology. It certainly did not exploit the possibilities of information technology to the fullest possible extent, nor lead to especially innovative approaches to analysis. In particular it did not really challenge the boundaries between data storage, analysis and representation. Hence the project also began to explore the possibilities of utilising the developing hypertext software for qualitative data analysis. This general approach formed an early phase of the development for the next methodological project, on which this book primarily reports.

It is worth noting at this point that since this initial methodological exploration of CAQDAS applications, the commercially available software itself has changed considerably. Both The Ethnograph and NUD*IST themselves have gone through successive new versions, and features have been added to them that go beyond the basic procedures that are described above. Several new applications – Atlas/ti and NVivo among them – have also come to prominence. The repertoire of widely available and well-documented software has also expanded. Scolari – a division of Sage Publications – distributes a range of research methods software, including the major qualitative software packages. It should not be thought, therefore, that the methodological work that first inspired the exploration of hypertext as an alternative to code-and-retrieve approaches – and that subsequently brought us to consider hypermedia strategies – reflects the state-of-the-art software commercially available a decade and more later. However, this should not detract from the general principle that there are limitations to such programs, and a need to explore the methodological possibilities of going beyond CAQDAS.

Hypertext

In order to explore a hypertextual approach to computer aided qualitative data analysis, Atkinson and Weaver had little dedicated software to choose from. The general hypertext program Guide was used, and the project considered how such programs might be utilised for the purposes of qualitative data analysis and representation. Unlike social science software such as Ethnograph and NUD*IST, Guide did not come with specific instructions as to how to use it in a social science environment. In many ways, therefore, this work involved a process of discovery, whereby the functions of Guide were adapted to the possible needs of qualitative researchers. Hypertext itself is a strategy that facilitates (indeed demands) flexible and varied approaches to the characterisation of a textual database. It can be used for a wide variety of purposes (and we discuss its general properties and uses in a later chapter of this book). It can be used to author a variety of texts and create 'alternative' stories; to create instructional materials; to facilitate linkages and cross-references between and across archived data sets and documents. The generality of software such as Guide was perceived as a possible strength, enabling qualitative research and analysis to move away from narrowly specified
or dedicated software. *Guide*, and other similar packages, permitted the analyst to create and trace multiple links and pathways through data. Although any hypertext program needs to be able to create links between textual elements, each program utilises different approaches for organising the task. *Guide*, which was one of the few commercially available packages available at the time, implemented hypertext linking through a series of ‘buttons’.

1 *Note buttons*: These used ‘pop-up’ windows, and provided a useful means of adding information to the data (such as background information about the social actors involved). Because the notes appeared in pop-up windows the analyst could make constant reference to the data when making or consulting notes; likewise, the notes were readily referred to while reading the data.

2 *Reference buttons*: These were used to create links between items of information within the data. They could, for instance, link chunks of data relating to a single topic. The paragraphs containing the relevant topic or reference could be linked together to create a ‘trail’. Within a trail the analyst/reader could browse surrounding text; or move from data in the trail to information about the trail (such as notes and comments). New trails could be created and old trails revisited at any point in the analysis. Reference links could also be created between notes or memoranda; or used to create links between the data and other ‘objects’ such as charts, glossaries, contents lists and so on.

3 *Expansion buttons*: These were used to create vertical links in the data. For instance, activating an expansion button in the data would ‘unfold’ the researcher’s analytical comments on them and, in turn, reveal buttons to analytic memoranda that relate to those data. Thus, the analytic memoranda (whatever their form and content) were always linked directly to the data themselves and could be activated very easily. Memoranda of different sorts and at different levels of generality could easily be created, and links between them maintained.

It was found that *Guide* could also perform tasks similar to a code-and-retrieve strategy, enabling researchers to reassemble pieces of text from various locations in the fieldnotes or transcripts identified as having a common reference. This was not achieved by attaching code-words, however. Rather, relevant segments of the data are copied into another document (i.e. a copy-and-paste procedure). Furthermore, when the data were thus reaggregated in *Guide*, the analyst was able to include additional commentary or contextual information (as hidden text, activated by a note button). Additionally, as both *Guide* and the wordprocessor operated in a Windows environment, the researcher could work with both applications simultaneously – copying from *Guide* documents into wordprocessing documents. Moreover, entire documents could also be imported into *Guide* documents: thus enabling links to be activated between research papers, documents, memoranda and data. A suitable bibliographic manager (such as Papyrus) also permitted analytic and data documents to be merged with bibliographic references.
Guide thus did not restrict qualitative data analysis to a code-and-retrieve approach. It also provided the capacity to create a genuine hypertext strategy that used the ‘button’ functions fully, and exploited the opportunities to create multiple ‘links’. By activating these links, trails through the data could be manipulated and facilitated at any point during analysis. Consequently, it was not necessary to decontextualise and recontextualise data (as in the standard code-and-retrieve approach) at all. Analytic memoranda, or preliminary analyses, did not need to contain segments of data: data and memoranda were instead linked through reference buttons. In addition to navigating through the field data, Guide also supported ‘browsing’ rather well. Reference links allowed the analyst to move backwards and forwards within and between data files. Again, such browsing was much more flexible than was possible, at the time, within programs such as Ethnograph or NUD*IST. Within Guide the analyst could be much more spontaneous and exploratory in developing and following up analytic ideas. With a fully realised hypertext application, such as Guide, there was no real distinction between ‘data’ and other materials such as memoranda. This high degree of integration, and consequent flexibility of such a hypertext application, suggested an analytic approach that was perhaps more faithful to the cognitive tasks and intellectual presuppositions of classic ethnographic inquiry. It also offered the potential to accommodate individual differences in analytic strategy between different researchers or research groups more readily than the more prestructured applications. The opportunity to create multiple links and trails could encourage the analyst to pursue dense networks of association and meaning, thus promoting the goal of ‘thick description’ (though no software can guarantee such analyses, of course). The hypertext strategy implemented in Guide allowed the movement from the data ‘upwards’ towards generic concepts theory-building. It was, however, equally possible to work from ‘top’ to ‘bottom’; whereby a more deductive approach to theory-testing could be taken, working from theoretical concepts downward through analytic memoranda to the data. This opportunity to follow trails in any direction proved especially valuable in the conduct of a secondary analysis of qualitative data: whereby decisions and their analytic consequences could be re-explored.

The use of a software package such as Guide as part of an approach to qualitative analysis highlighted one potential problem and one major implication. First, it highlighted a problem common to hypertext applications: it was dangerously easy for the analyst to become ‘lost in hyperspace’. It turned out to be possible to lose one’s place within the multiplicity of links, levels, windows, trails and so on. Second, the use of the hypertext application had significant implications for the actual processes of analysis and representation. The trails facilitated by Guide did not lend themselves to the production of simple texts. Except where emulating a code-and-retrieve approach, Guide did not facilitate the printing out of a ‘linear’ textual product. Thus it was possible to conclude that hypertext would ultimately prove not to be a (simple) tool for the production of conventional analyses and ethnographic texts. Rather, it might facilitate modes of (re)presentation in its own right. Indeed, Weaver and Atkinson concluded from their methodological experimentation that software like Guide may come to be
used to 'author' ethnographies differently, and in turn transform the very idea of ethnographic authorship itself. In other words, the ultimate product would not necessarily be a printed hard copy, in a linear arrangement, as in the conventional monograph. Rather, the results could be published in hypertext form, so that 'the ethnography' would be distributed via electronic media rather than as a book – or, perhaps, simultaneously in the two formats. A conventional report might be complemented by a hypertext. Hypothetically, therefore, the reader could exploit hypertext possibilities in order to follow his or her particular lines of analytical interest. The reading would thus be more active, more research oriented, and perhaps more akin to a secondary analysis of a (carefully edited) database. 'Writing up' the ethnography would thus consist of constructing the desired links, expansions, notes and other objects, and editing the 'data' in the process. Such a strategy would conceivably represent a major shift in ethnographic work, and would perhaps exploit information technology more thoroughly than those applications that are restricted to a cut-and-paste or code-and-retrieve strategy. Thus it would facilitate an analytic strategy and mode of representation grounded in new-media techniques (rather than simply emulating or replicating manual techniques and modes of presentation dependent on linear 'hard copy').

The development of non-linear modes of (re)presentation could be seen as congruent with some of the more avant-garde approaches to ethnographic work. In recent years scholars in anthropology, sociology and other cultural disciplines have increasingly recognised that the complexity and multiplicity of social life is not faithfully represented by 'monologic' texts of the conventional sort. It would be quite inappropriate to translate those arguments, which involve complex and fundamental issues of authorship and authority, epistemology and discourse, into mechanistic solutions. It would be even less appropriate to advocate computer software as a 'solution' to those epistemological questions. Nevertheless, the call for more 'messy' ethnographic texts, and for 'dialogic' rather than 'monologic' representations, may find echoes with some of the opportunities facilitated by hypertext software.

In many ways, therefore, the outcome of this methodological exercise was to suggest that a hypertext solution might form the basis for an innovative approach to qualitative data analysis and representation. Weaver and Atkinson argued that such a strategy could potentially integrate the full range of possibilities offered by digital information technology currently and for the foreseeable future. Hypertext offered an analytic approach that was firmly grounded in the intrinsic capacities of contemporary computing, as opposed to using the computer to carry out routine indexing and sorting tasks more rapidly (but in principle little differently from manual searching techniques). Such an approach also appeared more congruent with the rich variety of perspectives on ethnographic analysis and ethnographic writing that were increasingly characterising the field. Equally this was not a wholesale or uncritical endorsement of hypertext, nor any kind of technological determinism in thinking about research methods. Certainly it was not conceived as a naïve attempt to equate a hypertext computing strategy with the epistemological contestations of postmodernism.
Nonetheless, this project appeared to suggest that contemporary ethnographers could be exploring information technologies and their representational possibilities in a more flexible and exploratory spirit. This does not mean that the technology ‘solves’ any epistemological issues; nor that it maps perfectly onto any more general meta-analytic position. It does imply however that there are potentials worth exploring. These are certainly not the sort of issues that can be addressed a priori or ‘in principle’. Rather they call for practical engagement with concrete empirical research, with outcomes that can be inspected and evaluated by others.

**From hypertext to hypermedia**

The methodological exercise that has been described above concluded by outlining a programme for further research and development. It was certainly necessary to go beyond the implementation of one program and the manipulation of one secondary (textual) data set; to extend the analytical environment and the varieties of data that were worked with. Despite the research objectives that guided that initial project, the range of information technologies had not been fully exploited. Hypertext software was originally developed to create multiple pathways within and between documents of various sorts, but the general principle can be extended to incorporate data of different kinds. The use of digital technologies for example (such as digital photography or digital video) means that relevant data sets can actually be assembled from a variety of sources. Thus it is also possible to extend the hypertextual strategy into a hypermedia one, whereby multimedia components can be combined with hypertext linking, generating the possibility to integrate texts, still and moving images, and sound. This realisation guided the second phase of methodological innovation, the findings of which are reported upon in this book. We decided that we could start to (re)conceptualise this work in terms of an integrated digital and multimedia environment. This reflects the fact that ethnography itself is increasingly being thought of in terms of multiple media. While ethnographic film has always been a part of social anthropology, visual data are now being integrated into a wider variety of qualitative research projects. The methodology of visual qualitative research is an increasingly prominent part of the methodological literature. The technology itself has also been subject to considerable change, extending the possibilities for further work.

We felt that the sort of analysis (and indeed representation) that was produced using the hypertext software could be extended to incorporate a hypermedia strategy, in which complex analytic pathways could be constructed – and navigated – through multiple varieties of data. The potential strength of this combined hypertext/hypermedia strategy was that it would not import ‘quotes’ from visual data to illustrate textual materials, or vice versa. Rather multimedia data sets could be preserved, and remain available for inspection, in their totality. Thus analyst and ‘reader’ of the ethnography should be able to move from a particular segment of interview transcript to view the digital video recording of the interview. And move from that to other interviews on
the same subject – either in their textual representation, or in the sound and vision of the original recording. Just as in the original hypertext applications, this strategy offered the potential to create a powerful and highly flexible approach to analysis and to the processes of authoring and reading. Moreover, it offered the opportunity to rethink the boundaries, and dissolve any sharp distinctions, between analysis, writing (or authoring) and reading. This approach clearly builds upon activities similar to those that the first Cardiff project engaged in, predicated on the capacity to construct complex and developmental navigational pathways within and between data, commentary, illustrations, references to and extracts from other literature. This was, therefore, the general approach implemented in the second experimental project, and it is this work that informs the chapters that follow. Before introducing that work it is worth commenting on the (ever) changing technological environment within which this work takes place.

As this methodological work developed, there were significant changes in the commercially available software. CAQDAS became more widely disseminated and supported. This was an evolutionary process whereby several applications disappeared from the field, while others developed and expanded. Of the packages that the first project had considered and looked at (in the early 1990s) Kwalitan, Textbase Alpha and several of the others were no longer a part of the realistic array from which any researcher or research group would choose. Others, on the other hand, flourished, and became yet more widely marketed, and better documented (including later versions of both Ethnograph and NUD*IST). New applications were also developed. Not only did these software packages have more functions than their predecessors, they also included among them more features that parallel some of our own analytic preferences. A program like Atlas.ti, for instance, allows the analyst to create highly flexible, non-hierarchical linkages between data, concepts, memoranda and other kinds of information. Those links can represent different kinds of relationships, and also allow the analyst to incorporate and analyse visual data as well as textual materials. The commercial software itself, therefore, has moved forward from simple code-and-retrieve functions. There is certainly a degree of convergence between recent software developments and the hypertext/hypermedia strategy. In pursuing our own methodological research, therefore, and in reporting it here, we do not mean to imply that there have been no significant changes in the software with which we draw explicit or implicit comparisons. Nevertheless, there remain significant differences that we document and explore in this volume. Indeed, it remains the case at the time of writing that no dedicated hyperlinking package – for analysis and authoring – has yet appeared to support the kind of hypermedia approach we are trying to utilise.

There also continue to be significant changes in the conceptualisation of ethnographic research itself, and these have informed, and continue to inform our work. The past decade or so has witnessed numerous methodological developments and a proliferation of methodological literature. As a result, the overall landscape of qualitative methods is now a highly differentiated one. There are all sorts of different positions and principles – some complementary, others mutually antagonistic. In thinking about
possible relationships between general methodology, practical methods and information technologies, therefore, we need to recognise that methodologies have been changing as much as technologies. There is no single, stable version of ethnography to be realised using digital technologies. Ethnography itself has undergone a series of radical critiques, a number of supposed ‘crises’, and a host of general innovations (see Atkinson et al. 2001). Hence this volume embraces both the technological changes that had occurred during the intervening period as well as the ferment in methodology. Taking place in the late 1990s the research was intended to experiment with the use of digital technology in the different phases of ethnographic research – from fieldwork to the final ‘text’. We wanted to open up a dialogue on the ways in which the ethnographic process is reconceptualised through the utilisation of digital technology and the adoption of a hypermedia strategy. We surmised that there was potential convergence of ethnographic methodological work and digital technology that provided a fascinating opportunity for more creative uses of ICT.

Towards an ethnographic hypermedia environment

The project – The Production of Hypermedia Ethnography (funded by the UK Economic and Social Research Council) – engaged in the collection of primary data, and in this sense differed from the first project (which utilised a ‘cold’ data set). Given the aims of the project this necessitated the collection of data in digital formats, and a revised research strategy. The funding therefore covered two complementary posts. One was conceptualised as ‘the ethnographer’, working in a visually rich and complex research site, and the other was conceptualised primarily as a specialist in computing for the social sciences. The choice of site and of ethnographer went hand-in-hand. Bella Dicks was already working at Cardiff, and had already conducted extensive ‘conventional’ fieldwork in a South Wales heritage site (the Rhondda Heritage Park). This was ‘revisited’ as the site for the methodological project. The hypermedia ethnography would build on the ethnographic fieldwork that Dicks had conducted there for her doctoral research (Dicks 2000). Bruce Mason brought the necessary computational expertise as well as a background in qualitative research. His own doctoral research in Folklore combined the two, in a study of virtual communities. Although Mason took the primary responsibility for creating the hypermedia ethnography and Dicks took the lead in developing the ethnographic fieldwork, the lines were deliberately blurred in order to avoid creating a situation in which one person was the social scientist and one was the IT person. Each became proficient in digital tasks, such as video capture and hyperlinking, as well as playing a full part in the fieldwork.

The project on which this book primarily reports was set in an old colliery, situated in the ex-coal-mining Rhondda Valleys in south-east Wales, UK, and now transformed into a ‘living history’ heritage museum. In 1983, the Lewis Merthyr colliery closed; in 1991 the Rhondda Heritage Park opened. It is an old Victorian mine with impressive stone-built winding houses, winding wheels, a tall brick chimney-stack and
a large pit-yard. Its underground shafts and network of roadways were all capped in 1983, but, as part of the heritage experience, a simulated roadway was constructed in the pit-yard basements, sandwiched between the surface and the original underground workings far below. Ex-miners who used to work the neighbouring collieries now take visitors on guided tours of these buildings and roadways, telling them about their working lives as miners. In the old lamproom, visitors don pit helmets for a simulated descent underground in the ‘cage’; they emerge back out into the light via a bone-crunching simulated ride through the tunnels in a coal-dram. In the two winding houses and the fan-house, they watch audiovisual films, supplemented with soundtracks and illuminated three-dimensional dioramas, portraying the sights and sounds of life in the heyday of Rhondda mining.

The Rhondda Heritage Park is a site of public display and performance, where interactions occur between various ‘showers and tellers’ (the miner-guides, wall displays, artefacts and audiovisual films) and ‘viewers and listeners’ (the visitors). Guide–visitor interaction is two-way, to a certain extent, since visitors both listen to guides and talk back to them, asking questions and contributing their own insights. As well as this ‘front-stage’ interaction, the museum is also the site of ‘back-stage’ interactions: between off-duty guides, between guides and management and among visitors. Running through is the common theme of the past: how it is performed, represented and understood in terms of both public display for visitors, and as a day-to-day occupation and performance for ex-miners, who have very limited opportunities for employment in the contemporary local labour market.

As an ethnographic site, the Rhondda Heritage Park is crossed through with different and potentially competing representations of locality, community, pasts and the history of mining. Different ‘texts’ and ‘accounts’ are produced and reproduced at the heritage site. These include the audiovisual, graphic, artefactual and built representations of local history that are on display; the guides’ oral stories of their own working lives in their tours with visitor groups; and visitors’ own representations of that history as they encounter it. Like many new ‘living history’ museums, the Rhondda Heritage Park is a sensorially rich environment. It comprises audiovisual shows, three-dimensional dioramas, wall displays, soundscapes, reconstructed period interiors, dramatic buildings and machinery, and performing ex-miners dressed as working colliers.

This variety allowed us to collect an appropriately diverse range of research materials (including audiovisual recordings and interviews, documents, photographs and archival materials). These different data forms could all be turned into computer-readable formats through a variety of means (such as scanning, optical character recognition and analogue video capture), stored on CD-ROMs, and then manipulated and analysed using appropriate commercially available software. From here we set about the construction of what we called an ‘Ethnographic Hypermedia Environment’ (EHE) of the heritage site. The EHE we created exists in only partially realised form. It is illustrative of the potential of the medium, but is by no means complete. It focuses on exploring possibilities through the integration of video, audio, still and movable images, written text, interpretation and data.
Qualitative Research and Hypermedia

The data

The project utilised two complementary data sets relating to the same project setting: the existing one from previous research by Dicks authored in traditional print-form (Dicks 2000), and a new multimedia one, specifically assembled for the purposes of constructing a hypermedia ethnography.

1 Existing data: The pre-existing data set included interview transcripts with ‘encoders’ (the site’s designers and interpreters and the local government officers who managed it) and ‘decoders’ (visitor groups who visited the site over three days in 1995). It also comprised newspaper cuttings, visual publicity materials, an extensive archive of Council minutes and various consultants’ and agency reports relating to the development of the site.

2 New data: For the hypermedia project, we collected over 25 hours of video-recorded data of several kinds. We filmed both the front-stage guided tours and back-stage reflections and interactions. We also conducted three days of filming where we followed one guide exclusively for their working day. We also conducted video interviews with the guides in pairs and with visitors in groups. Finally, we took a number of still photographs of the site and its displays.

In the video-recorded tour data, we filmed tour groups as they moved around the spaces of the museum and as they and the guides interacted with each other and with the various exhibitionary environments they encountered on the tour. In each tour the focus was primarily on one group of visitors who had given consent upon entering the site. To supplement the tour footage, each chosen group was filmed afterwards as they talked to the ethnographers about their understanding of the past as encountered at the museum. The guides’ experiences were elicited through video footage of them as they performed their jobs both off-tour – in the guides’ room, and in their interactions with other museum personnel – and during the tours as they interacted with visitors. These were supplemented by ethnographic interviews with all of the guides. In addition, visitors were given a digital camera and took self-selected photographs during their visit. The ethnographers also took photographs of the site and of their own interaction with the visitor participants. Finally, the two researchers focused on different aspects of the ethnography. Dicks was primarily responsible for conducting the ethnography of the site while Mason took main responsibility for the reflexive side of the study by taking notes and photos about how the guides and visitors interacted with the ethnographers.

The EHE

The aim of the project was to experiment with constructing an ethnographic hypermedia environment, and this book is, inter alia, an extended reflection on the problems and challenges we encountered during that process. The aim was to produce a CD which users could access easily and within which they could explore a number
of key themes from the ethnography. Our intent was to produce an environment that both granted the ‘reader’ freedom to explore our data and reach their own interpretations, as well as making our own analyses and authored accounts available. What we wanted to avoid was producing, essentially, a book on CD – i.e. a text with moving pictures. We were looking to create something that combined the academic rigour of the published monograph with the creative possibilities afforded by hypermedia. However, we had little to guide us in setting up such a screen-based environment. Most hypertexts available at the time were instructional, oriented to the testing of learners’ knowledge. Others were hypertext fictions; a few non-fictional hypertexts existed, but these were far from being ethnographic. There were a number of fledgling CD-based ethnographies but these largely confined the enterprise to illustrated texts. In fact, a considerable portion of the project was dedicated to experimentation with a variety of representational approaches, and this enabled us to produce just a thematic section of the ethnography in hypermedia form.

We adopted a metaphor of the EHE as an ethnographic site (as well as ‘text’) that could provide a logically consistent framework for the viewer/reader. To do this we conceived of the EHE as being akin to an interpretative display and envisaged a number of different routes (which we termed "tours") through it. These tours would consist of our own ethnographic narratives, which would take the form of short, hyper-linked interpretative texts linked in turn to data extracts (in aural, video, printed, or graphic form). Users would be able to follow one or more of these tours or simply explore the data on their own, without following the ethnographic narratives. They could also dip in and out of the data, rejoining a tour when desired.

The tour(s)

Readers enter the EHE in a ‘reception hall’, mirroring the function of the museum’s reception area. Here, readers can choose to open a door marked ‘data’ (leading directly to the data) or, alternatively, one marked ‘tours’. The latter door takes the reader to the ‘tour hall’, in which they can select one of the ‘tours’ on offer. The guide/tour metaphor functions as a means of organising the reader’s encounter with(in) the EHE in a way that plays with and reflects upon the visitor’s encounter with the museum. For example, just as the ex-miner/guide takes the visitor on a journey to his world, the hypermedia ethnography takes the reader on a journey through the ethnographic world. Just as the visitor is actively engaged in interpreting the heritage site, so too the reader of the ethnography can actively construct her or his pathways through our interpretations and the materials on which they are based. Furthermore, just as the museum lays out an itinerary for the visitors to follow, directed by the guides, so the hypermedia ethnographer constructs a series of planned ‘tours’ through the ethnography. Thus, by foregrounding the equivalence between ourselves as authors of the ethnography and the guides as custodians of the heritage site, we wanted to exploit the navigational qualities of hypermedia to represent the ethnography in a form that mirrors the actual relations of the research site.
The two completed tours, *Transformations* and *Identity*, each experimented with a different navigational structure (see Chapter 7). In the *Transformations* tour, the linked interpretative texts are organised into a circle, which the reader can follow simply by hitting the return button at each screen. However, a number of ‘detours’ offer the reader a chance to explore related themes. Throughout, we worked with two kinds of screen ‘content’: interpretative texts carrying a short ethnographic narrative, and data texts carrying (extracts or entire instances of) interviews, reports, observational data, diagrams, and so forth. In addition – and this is where the major challenges and innovative potential of hypertext are to be found – each screen offered numerous links through to other screens via underlined words and phrases. Some of these link to data bytes – small data extracts (for example from interviews) – and others link to further interpretative texts or to citations from secondary sources.

The *Identity* tour structure was based on a pyramid, an idea that we borrowed from David Kolb’s hypertext, *Socrates in the Labyrinth* (1994). This tour is primarily video-driven. Four headings, read together, make up a sentence. Each of these then gives access to two, three or four further subheadings. These add other sentences into the narrative turning the original four headings into four paragraphs. By hitting the return button, the reader encounters each heading and subheading in turn, thus assembling, sentence by sentence, a narrative that encapsulates the interpretative heart of this tour.

The project showed us that an EHE is not simply the sum of its parts, but a new ‘multi-semiotic’ form of representation (cf. Kress 1998). It enables a new poetics of exposition that encourages the creation of customised linking structures to perform specific rhetorical functions (for example the use of hypertext structures such as orbits and pyramids to convey hierarchical argumentation). The ethnographer can direct the reader along interpretative pathways, as well as exploiting the potential for multiple pathways each with multi-linear directions. A hypertext could simulate a book by having each node equivalent to a page with bidirectional links taking the reader a page forward and a page backward. However, it offers the potential for more innovative work – creating other structures, which take better advantage of hypertextual multi-linearity. Later chapters discuss some of the various structures that hypermedia writing can adopt.

**Current work at Cardiff**

The project described above, which culminated in this partly-realised EHE, formed the basis for a further bid to the Economic and Social Research Council to continue our hypermedia work. We have been very fortunate in securing a third grant, this time to construct an EHE entirely from scratch. For the current project, which is still ongoing at the time of writing, all data records have been collected in digital, multimedia form (although we have also used more traditional recording techniques such as field-notes, subsequently digitised through electronic scanning). The similarity of the research setting chosen – an interactive science museum – has allowed us to develop some of the substantive themes already explored in the Rhondda project. In addition, we have
been able to put much more time into organising, interlinking and representing our
digital resources. Although it draws primarily on the work of our earlier project in the
Rhondda, this book has also benefited greatly from insights generated through work-
ing on this latest data set. The authors would like to register our appreciation and
recognition of the work undertaken by the other members of the current team,
Emma Renold and Matthew Williams, and, in particular, the project’s full-time visual
researcher, Bambo Soyinka.

**click here to learn more**

This book provides an account of our attempt to work with/in a hypermedia ethno-
graphy. Our account is divided into two main parts. The opening chapters critically dis-
cuss the methodological and technological debates which inspired our project and the
broader research contexts in which the project was located. Chapter 2 provides the
ethnographic backdrop to the project, while Chapter 3 examines the theoretical posi-
tionings and social research applications of hypertext. Chapter 4 explores the issues
raised by multimedia, ‘multi-semiotic’ ethnographic work. The second half of the
book specifically describes and reflects upon the process and progress of constructing
an ethnographic hypermedia environment. Chapter 5 provides a technical account of
how and why we used the relevant hardware and software (and can be skipped by
those who are more interested in the theoretical/methodological dimensions). The
chapters that follow expand upon our explorations and conclusions about the role of
hypertext/hypermedia in qualitative data analysis and ethnographic reading and writing.
Ethnographic Paradigms: Technologies and Representations

Qualitative social research (especially ethnography) has been the subject of considerable debate, contestation and development over recent years. The project of hypermedia ethnography necessarily sits within this broader picture. As already indicated in Chapter 1, the uses made of digital technologies are not neutral (and we would certainly want to avoid adopting a technologically determinist stance). Moreover, the activities of analysis and representation are not merely management devices without implications for, or recourse to, broader methodological and epistemological issues. Choices of analytic strategy are always dependent upon one’s underlying assumptions about, among other things, the nature of fieldwork, the epistemological status of empirical materials and the authoritativeness of representation and authorship.

In the current state of play in the social sciences, these fundamental issues cannot be taken for granted. Qualitative research has been marked for some time now by a range of different (even competing) interpretations and implementations (Guba and Lincoln 1994). It can no longer be considered a unified approach. Ethnography, in particular, has been at the epicentre of these debates. In fact, the currently diverse field of qualitative research has been to a large extent shaped by the influential theoretical and methodological debates that have occurred within the domain of ethnography over the past two decades. Consequently, it is this trajectory that the present chapter will chart. Our discussion here is not intended to limit the field of qualitative research to anthropological and sociological ethnography, but we do want to acknowledge the extent to which debates and controversies in the wider qualitative field have been prefigured in the latter. Debates within ethnography have served to trouble – but also to enrich – procedures for data collection, analysis and representation which were previously seen as relatively unproblematic. Indeed, qualitative research can no longer be
seen as a solely methodological category. Like ethnography itself, it now carries with it connotations of theoretical, epistemological and ethical debate and controversy.

The category of ethnography, a well-established approach to social research in anthropology and some schools of sociology (such as symbolic interactionism), has been undergoing a continual process of diversification and fragmentation over the past 20 or so years. This has given rise to a variety of standpoints. It is now possible to identify an almost carnivalesque range of approaches under the broad ethnographic umbrella, inspired by a consolidation of, or indeed departure from, accepted analytic traditions. While the sources of this diversity should not be reduced to a simple list of issues, one can recognise the interplay of (for example) poststructuralism, postmodernism, feminisms and postcolonialism. Throughout these various standpoints runs a discursive turn, treating as central but problematic the relations of language, knowledge and power. Many of these perspectives indeed give rise to analyses that render ethnography itself – at least in any conventional mode – highly problematic, if not all-but-impossible.

However, in contrast to this centrifugal, fragmentary movement it is also possible to identify a (parallel) centripetal tendency. There has been a convergence, endorsed by many qualitative researchers and methodologists, towards an ideal-type of data collection, storage and analysis. This model combines information technology and computing techniques with methodological perspectives that are associated with a version of ‘grounded theory’. Hence it is possible to detect a trend towards a homogenisation, and the emergence of a new form of orthodoxy (especially so at the level of data management). The use of computing strategies and software for qualitative data handling has become more widespread, even dominant, within the qualitative research community. The presuppositions and procedures that are inscribed in contemporary computer software for qualitative data analysis are implicitly driving a renewed orthodoxy. This is being adopted, often unquestioningly, in a large number of research sites around the world.

In this chapter we review these divergent trends within ethnographic practice. The chapter is not intended to be a comprehensive review of contemporary developments in qualitative theory and methodology. Rather, the chapter focuses on the implications of certain key new directions for the wider field of hypermedia qualitative research. We describe and analyse issues that can be subsumed under the general term ‘post-paradigm ethnography’ – meaning those revisions, new departures and reconstructions which have destabilised (and in our view enriched) the previously secure foundations of the ‘ethnographic imagination’. In doing so we hope to contextualise our point of departure from CAQDAS methods towards hypertextual and hypermedia approaches.

Contestation and the ethnographic representation of culture

Contemporary debates over ethnographic approaches to cultural phenomena have concentrated on issues of representation and the textual construction of reality (Atkinson
Qualitative Research and Hypermedia

1990, 1996). Emerging most starkly within the discipline of anthropology, these discussions soon spread to sociology and the ethnographic endeavour more generally. At the centre of such debates has been the critical reappraisal of ethnographic writing and the social production of the ethnographic text. Conventionally, the professional and academic (ethnographic) rite-of-passage has been completed and confirmed by the production of a major text. The anthropological monograph can be conceptualised as the culmination of the ethnographic enterprise and as the legitimating mark of the anthropologist. These relationships between fieldwork, text production and the discipline of anthropology developed over time. The ethnographic monograph gradually became the embodiment of the discipline itself and a signifier of the identity and status of its practitioners. Within the classical period of British and American anthropology, the ethnographic monograph enshrined a series of standardised representations of societies and (by implication) ethnographers as authors (Boon 1982). While the dominant ethnographic end-product has been the written text, there are, of course, other modes of ethnographic representation, including film. These can be as ‘conventional’ and artful as any written text (cf. Crawford and Turton 1992; Loizos 1993). The past 30 years or so has seen the rise of the subdiscipline of ‘visual anthropology’, and this, like its written counterpart, has also registered fierce debates associated with the discursive turn (we discuss the domain of visual ethnography more fully below).

Given the importance of ethnography as textual account, or interpretation, it is little wonder that radical assaults on the status of the text should strike at the roots of the discipline. Accordingly, in recent years, anthropology (and by implication ethnographic work more generally) has experienced a ‘crisis of representation’. (Indeed some commentators consider that qualitative research as a whole has experienced a triple crisis – of representation, legitimation and praxis – see Denzin and Lincoln 2000.) The textual foundations of ethnography have certainly been shaken and, along with them, the intellectual faith that has informed their production and reception. The status of ethnographic texts has come under scrutiny from outside as well as within anthropology (Atkinson et al. 2003). The critiques of ethnography in sociology have sometimes followed directions similar to those in anthropology (see Hastrup 1992b; Richardson 1994). In many ways, however, these debates have proved a less critical issue for sociology than for anthropology, not least because ethnographic methods and monographs have been much less central to sociology as a whole. Important though qualitative research is in many fields of empirical sociology, it does not underpin the entire academic enterprise as it does for anthropology.

Several of the positions which have contributed to the critique of ethnography have been associated with postmodernism. Postmodernism in general has certainly contributed to reappraisals of cultural representation, in the human sciences and beyond. It should be acknowledged, however, that these recent debates within ethnography are not necessarily dependent on postmodernism per se. Many of the current tendencies can equally be understood as developments of anthropology and sociological perspectives, rather than radical departures from them (Spencer 2001). The weakening
of cultural (and indeed) disciplinary boundaries – which has formed part of the backdrop to these debates – has been spurred by a movement which might usefully be called the ‘rediscovery of rhetoric’. Rhetoric is no longer consigned to the margins of legitimate scholarship, but increasingly is recognised as central to scholarly work and production. The classical theory and practice of rhetoric was concerned with argumentation and persuasion. The separation of rhetoric and science at the Enlightenment implied a radical distinction between two contrasted sets of commitments. On the one side stood science, reason, logic, methods and evidence. On the other side ranged rhetoric, persuasion, opinion and ornamentation. The aspirations of modern scholarship were firmly rooted in such dualities.

The separation of rhetoric from logic in the creation of modern disciplinary knowledge parallels a number of other, equally fundamental, separations and dichotomies. For ethnography it established the possibility of an observer armed with a neutral language of observation (untouched with rhetoric) and thus allowed for the elementary distinction between observer and the observed. The rediscovery of rhetoric creates the possibility of repositioning such distinctions; for example, through the removal of the (artificial) distance between the subjects and objects of inquiry, and the questioning of taken-for-granted canons of science and reason. It also reminds us that scientific accounts and texts have rhetorical qualities. It challenges cherished distinctions between scientific fact and textual production, or between the ‘reality’ of the natural-scientific world and narrative accounts of the social world. (For other accounts of representation of the natural and social, see: Bazerman 1988; Lutz and Collins 1993; Lynch and Woolgar 1988; Myers 1990).

The work of authors such as Edward Said (1978) has placed this weakening of cultural boundaries more overtly within a political perspective. Said’s sustained critique of the orientalism of Western models of empirical observation has served to strengthen the case that traditional ethnographic texts have a privileging effect. That is, the cultures that have been represented have been reduced to the subjugated and muted objects of a dominating discourse. In enumerating and classifying the exotic characteristics of the oriental, then, the privileged observer has established a position of authority, which is inscribed in the texts of exploration, description and classification (Marcus 1992). A virtually identical set of issues can be described for the encounters of the old world with the new in the conquest and appropriation of the Americas. From the earliest accounts of the Spanish conquests through to the accounts of nineteenth-century explorers and ethnologists, the continent has been populated by others and appropriated through the accompanying representations. The texts of exploration and exploitation repeatedly inscribe the metropolitan perspective and the alterity (otherness) of the new world (Pratt 1992; Todorov 1984).

Feminist theory and praxis has also questioned the thus far privileged position of observer-author. Here the argument has not been about the over-or-under representation of men and women as ethnographic authors, but rather about the relationships between feminism, gender and ethnography at more fundamental levels (Jennaway 1990). Clough (1992), for instance, has articulated a feminist position that draws on
psychoanalytic perspectives. She argues that from a feminist standpoint one can see the standard realist accounts of ethnography as incorporating unconscious fantasies and desire concerning race, gender or class. Realism, she contends, suppresses those unconscious processes under the guise of factual discourse. Wolf (1992) also offers a feminist perspective on ethnography and representation, suggesting that reflexive, self-critical attitudes are particularly characteristic of feminist thought. Feminism in general encourages an examination of power and powerlessness, the mutual obligations of researcher and researched. Wolf argues that feminist scholars are exploring these issues independently of their becoming fashionable topics among male anthropologists, a view supported by Jennaway (1990). As Wolf suggests, the heightened sensibilities of feminist scholars have led directly towards engagement with a politics of representation. Mascia-Lees et al. (1989) draw attention to a concern among feminist anthropologists for modes of understanding (including writing) that do not reduce women to the position of voiceless objects, but treat them as subjects in their own right, entitled to their own voices. This echoes the very foundations of the feminist research process – the concern with voice and authority, accounts and experience (Olesen 2000; Skeggs 2001). This feminist strain of ethnographic critique is reminiscent of the distinction, first elaborated by Shirley and Edwin Ardener (Ardener 1975), between dominant and muted groups. This view proposed that there are fractions of the population whose culture, or world-view, is dominant, and others – the dominated – who are ‘muted’ in that they are deprived of their own culturally legitimated means of expression. Muted groups are seen – and must often see themselves – through the categories of the dominant. They are visible and audible only through the eyes or voices of the dominating groups. As a consequence, they cease to be the subjects of their own experiences and actions; they are reduced to being the objects of other subjects. It is argued, therefore, by feminists and other critics of classic ethnographic discourse that the ‘others’ of such inquiry and such description are rendered mute. Indeed, when the objects of ethnography are already dominated, the ethnographic gaze may be in danger of performing a kind of double subjugation.

The representation of social reality has therefore become contested, within and outside the auspices of ethnography. A consequence of this has been critical attention to ethnographic texts. Their historical and stylistic continuities with so-called realist fiction have by now been extensively analysed (Atkinson 1992; Cappetti 1993; Krieger 1983, 1984). Literary realism has been identified as the dominant mode of representation within ethnography, implying an impersonal, omniscient, all-but invisible narrator (Charmaz and Mitchell 1997; Van Maanen 1988). It is a genre of authoritative reportage; a collection of familiar literary devices for the construction of factual authoritative accounts. However, despite this tendency towards a realist approach, it remains by no means clear that literary realism is the only – or even the best – way to produce accounts of varied and complex social worlds. Indeed, there is something of a paradox in the use of what might be called a ‘straightforward’ realism for ethnographic purposes. There is certainly a tension between the conventions of realism and the assumptions of most ethnographic work. Most ethnographers recognise the complexity
of social life and its collective (and multiple) representations. Equally, they recognise the fundamentally constitutive nature of language. That is, language-use helps to create and construct social reality. Interpretative anthropologists, for instance, are committed to the ideals of ‘thick description’ (Geertz 1973), while symbolic interactionists endorse an interpretative sociology that places language at the heart of an essentially constructivist view of reality and representation. And yet conventional realism is founded on a very different treatment of language. Such realism has historically encouraged little or no explicit concern for the language of representation itself. Realism treats language as a taken-for-granted resource. The realism of conventional writing may therefore ironically result in rather ‘thin’ description. Such arguments, set within the broader debates outlined above – that narratives and descriptions from a single, implicit point of view may not do justice to the complexity of cultural forms – have given rise to various alternative approaches.

These different approaches to representation epitomise the diversity of more recent ethnographic work, and reflect the interpretative turn in ethnographic writing and representation. Various commentators have called for texts that are more open, messy and fragmented – in order to challenge and highlight the very conventionality of ethnographic writing and to encourage more creative and complex modes of representation (Denzin and Lincoln 2000; Ellis and Bochner 1996). While the conventionality of all modes of representation is implicitly recognised, there is more than a hint in such arguments that complex texts may be more faithful to the complexities and contours of social life. Alternative representational modes draw more on dialogic approaches (Allan 1994; Dwyer 1977, 1979; Holquist 1990) and can include ethnographic script or theatre (Mienczakowski 2001), poetry (Richardson 1992) and fiction. These approaches are also related to the more general promotion of biographical and autobiographical work in anthropology and sociology (Hastrup 1992b; Plummer 2001; Reed-Danahay 1997; Stanley 1992).

Some authors have chosen to take the relationship between research, the text and the self further; locating the self more centrally in the contexts and products of qualitative inquiry. These have taken a number of forms. For example, research monographs such as Crafting Selves (Kondo 1990) and Blacked Out (Fordham 1996) present multi-layered texts which challenge the dichotomy between researcher and researched, author and Other. These ethnographers-as-authors frame their research accounts alongside personal reflexive views of the self. Their ethnographic data are situated with/in their personal experiences and sense making. These authors themselves form part of the representational processes in which they are engaging, and are part of the story they are telling. Recent years have also witnessed a new wave of autobiographical-ethnographic work that has taken the self as the explicit focus of inquiry. Much of this writing has focused on highly personal or sensitive experiences such as illness, death, or personal relationships (Kolker 1996; Paget 1990, 1993; Sparkes 1996; Tillmann–Healey 1996). Such texts are not simply ‘confessional’ tales (cf. Van Maanen 1988) of the naïve incompetent, overcoming adversity and difficulty in the quest for data. They are not simply providing personalised accounts of fieldwork, or
the research process. Rather, the self and the field are interwoven – ethnography and autobiography are symbiotic.

The general affinities between experimental ethnographic writing and postmodernism are clear. Postmodernism, in recognising and celebrating the diversity of types and representations, encourages a variety of genres. It also encourages the blurring and mixing of genres. It questions the monovocal expression of authenticity in favour of polyvocal texts and the celebration of diversity. There is, therefore, much in postmodernist writings to commend various radical re-evaluations of ethnographic writing. However, it is not necessary to appeal to postmodernism. It is arguable that the possibilities for textual experimentation are contained within the modernist movement in literature. Modern literature provides us with a multiplicity of textual formats and devices for the construction of written representations. Modernist fiction found many ways, for instance, of representing the mingling of external events and inner dialogue; of reconstructing the minutiae of extraordinarily detailed description; of linking factual reportage with the fantastic. By adopting some of these ‘new’ conventions and by experimenting in similar ways ethnographic texts can also be viewed as undergoing a (more) modernist movement.

The reflexive self and beyond

Contemporary ethnographic practice has increasingly been characterised by an emphasis on reflexivity. Indeed, one might argue that the postmodern turn is as much a turn towards the reflexive as it is a turn away from realist representation. The idea of reflexivity has a number of different – if ultimately related – connotations. Hammersley and Atkinson (1983, 1995) proposed the principle of reflexivity as the dominant epistemological position from which ethnographic work should be undertaken. Placing it in opposition to both crude positivism and naïve naturalism, Hammersley and Atkinson suggested that all social research in principle – and ethnographic research a fortiori – necessarily involved the engagement of the researcher with the social world under observation. One cannot produce a description of the social world that is completely independent of the observer. This is not just a trivial matter of claiming that people act differently if they are under observation. It means that the researcher is always implicated in the social life that he or she seeks to account for. There can never be a completely neutral vantage point from which to observe the social world, nor a neutral language of description through which to describe it.

The general principle of reflexivity has been widely recognised. In one form or another it is more likely to be endorsed than formulations that imply that the ethnographer can study a social world as if he or she were not an engaged observer. The implications of reflexivity have now been widely endorsed and explored (see Davies (1999) for an excellent overview of reflexivity and the different positions it can imply). Reflexive ethnography – or at least the recognition that ethnography is inescapably reflexive – means that the self of the ethnographer becomes a central topic for reflection.
and documentation. If the social world is unavoidably affected by the presence of the ethnographic observer, then the ethnographer is equally affected by her or his personal engagement with the ‘field’ of research. This personal engagement can take many and multiple forms, with implications for the ethnographer’s identity construction, embodiment, emotionality and personal relationships (Coffey 1999).

Alternative forms of ethnographic representation have been particularly well utilised as mechanisms for representing deeply personal (or sensitive) events, emotive voices and stories, and for making the author a visible presence in the text. As was noted above, authors have given ethnographic purchase to their personal experiences of illness and the body, as well as using ethnographic writing to explore deeply personal experiences and relationships (Ellis 1995; Ellis and Bochner 1992; Fox 1996; Quinney 1996; Ronai 1996), and the autobiographical processes of writing and representing (Bochner and Ellis 1996, 2002; Ely et al. 1997; Richardson and Lockeridge 1991). All of these personal or autobiographical narratives can be located within a broader (new) genre of autoethnography. This term encapsulates many variants on a theme – such as autobiographical ethnography, ethnobiography and personal ethnography (Ellis and Bochner 2000; Reed-Danahay 1997). Autoethnographic texts are first-person accounts, drawing explicitly on personal experiences of the author. They are autobiographical ethnographic ‘essays’ that can take different representational forms – for example dialogues, scripts, stories, poems, diaries and journals, photographic essays, biographical reflections and multi-layered writing. Ellis and Bochner (2000) are strong proponents of this approach to ethnography, suggesting that it enables personally meaningful ethnography and the working of the spaces between social science prose and other genres. By ‘troubling’ the conventional genres for (re)presenting culture, the dichotomy between the personal and the intellectual is thus disrupted (Reed-Danahay 2001).

The myth of the silent author has long been exposed in ethnographic writings. The position adopted by Charmaz and Mitchell (1997: 194) occupies a middle position within these debates. They argue that just as there is merit in humility and deference to the views of Others, and to reasoned, systematic discourse, so too is there merit in ‘a visible authorship’. While the words of ethnographers are neither magical nor authoritative, neither is the author’s voice a biased irrelevancy. They advocate texts where the author is an active and vocal participant. This highlights an understanding of voice articulated by Hertz (1997); resolving the dilemma of presenting the author-self while simultaneously writing and representing the voices and selves of Others. The autoethnographic approach is just one way in which contemporary researchers seek to dissolve distinctions between the researcher and the researched, and apply reflexivity to their work. The reflexive gaze thus mirrors the polyvocal text, in that both transgress the assumptions and conventions of the traditional ethnographic encounter between the Self and Other. Contemporary alternatives grant (muted) others a position as active subject, while rendering the Self as object for ethnographic scrutiny. The autoethnographic turn, like various kinds of experimental writing, introduces new ‘voices’ in ethnographic representation. Most importantly for our general purposes here, it challenges the stance of the conventional ethnographic text.
The ethnographic monograph – whether in social anthropology or sociology or other related disciplines – more often than not relied on the single viewpoint and the authorial voice of the omniscient observer-as-author. In that sense, therefore, the ethnography was monologic – a text in which one voice predominated. Of course, others were represented in the text, but they were essentially presented to the reader through the mediating gaze and framing devices of the author. The crisis of representation, and associated attempts to create alternative textual forms, was not merely, therefore, an aesthetic departure. Recognition of textual conventions revealed the more profound conventions of ethnographic practice. It made manifest the means whereby the mono-logic and authority of the research and of the text were sustained. As a result, a number of reflexive, experimental writing genres have appeared that try to do justice to this more self-consciously subjective view of ethnographic knowledge (Goodall 2000). Many of these, as we have seen, construct first-person stories rather than trying to maintain the conventions of impersonal, academic argumentation and persuasion.

Towards a global ethnography?

Nevertheless, the explicit embrace of first-person voices has not been universally welcomed into the domain of ethnographic writing. Some conceive of it as a retreat into ‘purely’ subjective, unambitious accounts which neglect other, equally important, dimensions of ethnographic work – such as the generation of more generalisable kinds of understanding and knowledge that go beyond the realm of interpersonal perspectives. Brewer (2004) makes a different kind of objection, arguing that ethnography is necessarily grounded in the authority (both of the data and the ethnographer) to make carefully researched empirical generalisations. Against the more introspective tendencies, then, there is also a strand of current thinking which moves what Grimshaw (2001) calls the ‘ethnographic eye’ outwards away from the micro-spaces of situated interactions.

Burawoy and his collaborators (1991, 2000), in particular, have argued cogently for a ‘global’ ethnography. For this, they recommend the ‘extended case method’. Here, the researcher first situates him or herself, for ‘extended periods, within the micro-life-spaces of the everyday. Then s/he adopts a strategy of ‘extending out’ from participant observation to analysis of wider power relations (Burawoy 2000: 25). Burawoy (2000) argues that extended ethnographic work of this nature should undertake three axes of study: external forces, connections between sites, and imaginations from daily life. External forces can include the analysis of such factors as market shifts and other economic pressures, or changes in state welfare policies. Describing and analysing them does, Burawoy admits, run the risk of objectification. Yet this is a necessary danger, he maintains, for it is essential to pay due attention to influences of ‘extralocal determination’ (Burawoy 2000: 27). Burawoy does not see this kind of analysis as incompatible with reflexive ethnography. On the contrary, he sees it as essential that the researcher always question and revise the adequacy of his or her account, and expose
emergent theories ‘to continual critique from those they presume to understand’ (2000: 28). It should be noted that this more fluid conception of the field, with clear connections made between the local and the extralocal, and between processes and forces, is not new. As Burawoy (2000) himself acknowledges, the extended case method owes a considerable debt to an older school of ethnography, notably the Manchester School of Max Gluckman’s time. Nevertheless, it has been given extra impetus by a widespread and accelerating awareness of the dynamics of globalisation. This has made it less credible to study, say, young people’s fashion choices in the UK in isolation from the social and economic relations of the Filipino sweatshop.

There seem, then, to be two directions in which ethnography is currently moving (sometimes, but not necessarily, contradictorily). On the one hand, there is a move towards the self-orientation of the reflexive project, in which the description of the self emerges as only one voice among many, and from which there is a reluctance to extract an overarching, generalising perspective. On the other hand, there is a move to recognise the extent to which the self is always located within, and constrained by, wider forces and pressures in today’s global order. To describe the latter requires a more general, objective, comparative perspective, in that global flows are not necessarily apparent to the various selves whose lives they circumscribe. In many ways, these two movements are not in conflict. Once the self comes to be seen as ‘unmoored’ from traditional, bounded areas of study (such as communities, institutions, workplaces, local cultures and cities), and from a fixed belonging in particular places and times, a new horizon for ethnographic study potentially opens up. In it, the self’s entanglement in wider threads of connection and dislocation can be more clearly perceived. This means taking both reflexivity and globality seriously. Indeed, there is, it seems, a need for a dual focus, both into the self (including the ethnographer’s self) and outwards from the self. It should be said that this is something that even more consciously postmodernist ethnographers have argued for, too. Clifford (1997), for example, recommends multi-site analysis. This is an ethnography attuned to the mobility and interconnectivity of social relations, rather than to the implications of fixity and dwelling conferred by the conventional notion of the field. Earlier, Marcus and Fischer had also argued that ethnographers need ‘to place their subjects firmly in the flow of historic events’ (1986: 44).

In these perspectives, the field splits into multiple sites of enquiry. Clifford (1997) cites Susan Harding’s (1994) research into Christian Fundamentalism as an example of multi-site analysis. This involved analysis of inter-textual practices, such as newspaper and televisual discourse, as well as the talk of research participants. Burawoy and colleagues would go further and insist on the need to travel to and study a range of physically distant sites, in order to grasp their interconnections. It is clear that the idea of doing justice to subjective voices, as well as being able to paint the bigger picture is a difficult and ambitious project to manage. Social researchers have often polarised the sociological terrain into the micro and the macro levels, and it has been difficult to integrate the two. Yet the new language that ethnography is striving to find needs to aim, arguably, at precisely this integration.
**Qualitative Research and Hypermedia**

**Hypertextual ethnography**

It is here that hypermedia methods can potentially be of value. Firstly, hypertextual writing has been seen as a means of accommodating the reflexive turn without necessarily sacrificing the project of coherent argumentation (Douglas 1998). For example, David Kolb’s philosophical hypertext on CD-ROM, *Socrates in the Labyrinth*, shows that hyperlinked writing can still make claims for knowledge while foregrounding the contingency of particular interpretations. Hypertexts allow a number of paths to be presented within the same writing space, so that the reader can explore the multiplicity of interpretations to which one proposition, event or situation gives rise. (Nevertheless it should be said that hypertext can equally, and perhaps more notoriously, be used for conveying a sense of the endless deferment of meaning – of a labyrinthine fragmentation and excessive openness. This is not where we see its value lying for qualitative research. But these are arguments which we pursue more thoroughly in later chapters of this volume, particularly in Chapter 8.)

Second, hypermedia does, by its very nature, broaden the notion of the field. It does this in two ways: by allowing the complexities of social action to be represented through a variety of media (instead of being squeezed into the ‘grammar’ of just one medium), and by allowing all kinds of secondary materials and texts to be included in a radically interlinked representation. Indeed, building an ethnographic hypermedia environment is itself a project of de-centring, of showing the multiple connections among different elements, as well as their links to others beyond the study-area itself. In the process, the idea of fixed field boundaries necessarily dissolves. We are not claiming that the kind of integrated ethnography envisaged here can only be produced in hypermedia form. Clearly, that would seriously undervalue what can be achieved with more conventional modes of writing. What we are suggesting is that the subject matters of ethnography and qualitative research are bound to become more complex as our understanding increases both of the self as reflexive subject, and as actor caught up in wider networks and global forces. This more complex project can only benefit, we contend, from more complex and fluid methods, including representational forms that can do justice to multiple interconnections and voices.

One of these complexities is the politics and poetics of representation itself. In a sense, ethnography is becoming self-referential. It is always, in principle at least, not just a text about a chosen social world, it is also a text ‘about’ the very possibility of representing a social world through textual (and other) means. It invites the reader to recognise that a social world is being reconstructed through the interpretative and representational work of the ethnographer/author. Accordingly, the ethnographic text is becoming more demandingly complex. Just as it can be inhabited by different styles, it can operate with more than one viewpoint, with multiple layers of interpretation. The perspective can shift back and forth between different actors or groups, reflecting a culturally and socially complex field of social relations and systems of signification. It can ‘zoom’ in on minutiae of conduct or on individual actors and artefacts. But it can also broaden out to take in a wider social or cultural context.
Visual ethnography and experimental approaches

The idea of zooming in and zooming out, of representing alternative perspectives simultaneously and of bringing a number of intertwined stories together, is characteristic not only of contemporary ethnographic writing. It is also one that immediately brings to mind the medium of film. Hypermedia, as a complex fusion of written text, sound and images, potentially has film at its heart. We have already explored the affinities between new styles of ethnographic writing and hypertext (see Chapter 1). Film, too, brings its own characteristic capacities for representing the social world in complex and nuanced ways. What Marcus (1994) calls the ‘cinematic imagination’ has an inherent facility for showing a multiplicity of perspectives and movement through time and space (via flash-forwards and backwards, cross-cutting scenes, and so forth). Hence, filmic devices have been seen as particularly amenable to many researchers’ desire to represent reflexivity, complex inter-relations and contingency (see also Denzin’s 1991 discussion of cinematic metaphors in contemporary social theory).

Yet film itself is not necessarily more ‘open’ or reflexive than written ethnography. On the contrary, film has often been argued to be more closed and determinate, less able than writing to convey complexity and contingency. Indeed, film has by necessity evolved its own techniques of persuasion, authority and credibility. These have not, obviously, relied on those established within the domain of writing, but have been the result of over a century of development of carefully honed camera and editing techniques. These have been designed, in large part, with the goal of convincing audiences of the truthfulness and credibility of the scenes the camera depicts. Hence there is a powerful toolkit of realist devices out of which much mainstream film narrative is built. They provide the reality-effects that constitute film’s claims to represent a believable social world, into which the audience is drawn.

However these realist devices have never enjoyed a monopoly within film practice, and especially not in ethnographic film. It would indeed be quite wrong to construct a simple opposition between the filmic and written modes in ethnography. As we have seen, written ethnography does not comprise a single approach or vision but is characterised by diversity and contestation. The same is equally true for film. The field of ethnographic film, too, is a complex and shifting one, characterised by its own modes of experimentation and internal critiques. Indeed, it, too, is currently experiencing its own crisis of representation. Ethnographic filmmakers have debated issues of representation and power in similar terms to ethnographers who use the printed word. In visual ethnography, however, the primacy of the image has brought particular concerns into play. Is the image a record of reality? A testimony? A document? A viewpoint? An intervention? Or perhaps only ever a distortion? In recent years, the camera-gaze has increasingly been recognised as a potentially objectifying mechanism. Particularly if used in classic realist modes, it is seen as activating entrenched social, sexual and psychological dynamics, resting on the unequal power-relations that pertain between spectator and spectacle. Accordingly, postmodern filmmakers have tried by various means to disrupt the conventional camera–object relation, and to dislodge the ethnographer’s privileged
A new generation of non-Western documentary filmmakers has challenged the taken-for-granted unidirectionality of Western-made ethnographic film, rejecting it as voyeuristic representations of an exoticised Other (Weiner 1994). Further, there have been ongoing debates about the ontological status of visual material generated through the camera: is it data in the form of evidence and thus an objective record of the field? Or is it a particular way of seeing which brings its own inherent subjectivity and perspectives? These debates have led to others, such as the question of whether to edit recorded sound and video footage or whether to leave it as ‘faithful’ recordings of the field. The authority of ethnographic film itself has been troubled in recent years, and subjected to ongoing critiques paralleling those presented within written ethnographies.

The enormous excitement generated by the twin birth of film and anthropology in the closing years of the nineteenth century has been commented upon by Grimshaw (2001). By taking a camera into the social world, as Alfred Cort Haddon and his colleagues did in their famous 1888–89 Torres Strait expedition, anthropologists could show to home audiences, for the first time, distant, living people engaging in various activities – lighting a fire, performing ceremonial dances. In this work, inspired as it was by the Lumière brothers’ early films, the camera maintains a respectful distance, statically recording a tableau lying in front of it, rather as if it were a piece of theatre. Later, Flaherty’s famous film about Canadian Inuit life, *Nanook of the North* (1922), continued this essential approach. The camera is used as an extension of the eye and the arm, to observe, as closely as possible, a series of static tableaux (Grimshaw 2001). Long camera takes are at the heart of this method, reflecting its fundamental ‘respect for the integrity of reality’ (Grimshaw 2001: 49) and preserving the spatial unity of the event (Bazin 1967). This unified approach to camera takes was very different from the then-developing techniques of *montage*, pioneered by the work of D.W. Griffith in the second decade of the twentieth century and perfected by the Soviet film-makers Vertov and Eisenstein. In montage, post-production editing is used to produce a whole from an assemblage of fragments shot in the studio or field location. The sense of the film is produced through this work of assemblage rather than through the real-time unfolding of events and situations in front of the camera. It results in a film composed of sharp contrasts, rapid juxtapositions and contradictions, and was used by early-twentieth-century directors to represent the complexity and movement of the modern world. Flaherty’s camera, by contrast, can be seen as an attempt to deny the presence of the modern world of technology. It lingers on the faces of individuals and on the panoramas of landscape, suggesting an essential timeless harmony between the two (Grimshaw 2001).

Grimshaw suggests that Flaherty and the seminal anthropologist Malinowski, never collaborators, perhaps never even known to each other, shared the same sense of vision – one that sought to celebrate and preserve the unity and integrity of native life lived in a designated place. Such an approach tends to ‘gather up native life and deliver it to the reader/viewer’ (Grimshaw 2001: 56). Indeed, Flaherty’s *Nanook of the North*, as well as the later British interwar documentary films of John Grierson, such
as Coalface and Housing Problems, and Basil Wright's celebrated Song of Ceylon (1937), were all films which tried to show the essential interdependence between people and their environments – whether urban industrial or rural pastoralist. In many ways, they are characterised by a marked objectivism (Asch 1992). In them culture is treated as a broad and highly structured object, peopled by individuals depicted primarily as if they were its representatives. There is often little in the way of insight into the varied feelings and personal experiences of individual subjects. People are commonly represented as types, attesting to the various parts of the cultural whole.

By contrast, the postwar cinéma-verité movement, with French filmmaker Jean Rouch at its centre, sought to express the complex subjectivities of people fully embroiled in the changing and fluid relations of the modern world. Rouch's films of the 1950s (Jaguar, Les Mâtres Fous, Moi – un Noir, La Pyramide Humaine, amongst others) are set in West Africa, and they seek to invoke life as it is lived by individuals – spontaneous, unscripted, undirected and unfolding. Constantly moving, hand-held cameras get inside the scene itself so that the camera becomes a participant rather than a detached observer. Montage is used to convey movement and complexity. Rouch's anthropological cinema does not set out to document or explain an objective, external reality, but rather to disrupt and disturb conventional notions of scientific inquiry, knowledge and reason. Rather than ethnography as observation, he is interested in exploring the juxtaposition of personality and society – the inevitable subjectivity of human experience, of ‘active human agents with complex inner lives’ (Grimshaw 2001: 102).

Such projects are open to the charge of romanticising people's individual responses and celebrating their essential ineffability, at the expense of trying to understand and represent the wider social and cultural contexts of their lives. As in written ethnography, this signals a central tension in ethnographic film. How can the filmmaker do justice both to the objective external conditions of human existence and to the subjective internal responses of individuals? How to avoid reducing people to types, while also creating full and detailed portraits of whole cultures, places and times? How to further ethnographic knowledge about the world, yet still remain true to the project of telling people's stories in their own voices? This is similar to the conundrum that emerges in written ethnographies, discussed above, in relation to fieldwork voices versus more impersonal kinds of knowledge. Filmmaking partnership David and Judith MacDougall's work has represented a sustained attempt to engage with these questions (see Grimshaw 2001). From their development of observational cinema in the 1970s (e.g. To Live with Herds) to their embrace of participatory cinema in the 1980s (from the East African The Wedding Camels to their Australian Aboriginal work), the MacDougall's have sought to come to terms with the indeterminacy of knowledge, of what can and cannot be known (and shown) about other people, and under what conditions. Issues of the camera's shooting style, position and movement have all come to be acknowledged as raising central questions of power. The MacDougalls' work reflects upon this, arguing for an 'unprivileged' style of camera-work (MacDougall 1998). This restricts the camera to the position of a human participating in the scene and confined to a particular perspective within it, rather than as an all-seeing, ubiquitous, omniscient eye.
This kind of observational filming follows Bazin’s principle of using the camera to respect the unity and integrity of events. It eschews cutting, re-enacting, interviewing, directing and authorial voice-overs. Rather than pretending that the camera’s perspective is the objective one, David MacDougall (1998) argues that film should reveal that filmmakers (indeed like other ‘authors’) are human and fallible, have limited perception and are situated within physical space and wider society. As Hockings has observed, ‘David MacDougall’s films show us quite clearly that he was a foreigner in East Africa’, something which was ‘certainly much truer that any attempt to convince us that he, the foreigner, wasn’t there, whereas we, the viewers, are there!’ (1994: 518). Grimshaw sees the MacDougalls’ project of ‘unprivileged’ camera-work as a turning away from vision towards voice, or rather voices. Instead of the filmmaker drawing a complex and detailed tableau of life ‘out there’, he or she presents the voices, performances and conversations of participants, showing up the intensely subjective and contested nature of reality. Sound, in this way, becomes increasingly important, as opposed to image alone.

Such developments have led to a more genuinely collaborative ethnographic film, in which participants are granted a more central, speaking role and the ethnographer-filmmaker reflexively draws attention to the partiality of his/her own perspectives (Barbash and Taylor 1997). Moving away from the idea of a cinematic essay that tells the viewer about the world to a nexus of voices which shows the viewer a world, the ethnographic film has become a more self-consciously subjective project. The use of non-narrative techniques, such as episodic structures (as in Melissa Llewelyn-Davies’ television film series on the Maasai, _Diary of a Maasai Village_, 1984), also foregrounds the impossibility of narrative closure, drama and resolution. Rather than an object that can be observed and described by an expert, culture is increasingly seen as that which is produced through the actions and interactions of participants. As a result, people’s lives emerge less as a cultural whole than as a series of fragments and interconnections that do not necessarily add up to a totality. Like their written-mode colleagues, ethnographic filmmakers increasingly use reflexivity to draw attention to the constructedness and partiality of their accounts of reality. Cameras and microphones, once hidden, now make frequent appearances in film (Moore 1994). In _Memories and Dreams_ (1993) Llewelyn-Davies films a group of Maasai women watching her earlier films about them on a television monitor and discussing their current lives in relation to these images. Here, live conversations, episodic scenes and extracts from previous films are cut together, creating a sense of the contingency of the earlier footage. An early example of a self-consciously reflexive film was Tim Asch and Napoleon Chagnon’s celebrated _The Ax Fight_ (1975), which is structured into five parts and which documents a fight among the Yanomamo tribes of the Amazon rainforests of Venezuela and Central Brazil. Each shows the processes by which the filmmakers groped their way towards an interpretation of the action contained in the rushes. Only in the fifth and final part are we shown the edited film as ‘finished’ interpretation that makes sense of the fight itself (Barbash and Taylor 1997).

However, by the 1980s, the _Ax Fight_’s reflexive style of filmmaking was also coming under a new kind of theoretical scrutiny. Asch and Chagnon’s film shows the axe
fight, first, as scenes of inexplicable chaos and then, finally, as ordered into a rational framework by the filmmakers’ editing. It could be argued that this device simply disrupts formal narrative expectations in order to ‘gain a rhetorical advantage for science and explanation’ (Moore 1994: 129). The Western eye, this film seems to suggest, has the monopoly on sense-making, which the Yanomamo need in order to be capable of being understood. Further, the foaming mouths of the fighters and the screaming women are presented for us as spectacle. Such filming styles came under increasing criticism in the 1980s from within film studies, particularly as influenced by feminist theory (cf. Mulvey’s 1975 theory of scopophilia). They were seen as based on powerful, Western-centric ‘narcissistic, voyeuristic, sadistic and fetishistic mechanisms’ underlying the camera-gaze (Nichols 1994: 62). Hence, Nichols argues that ‘the separation of Us and Them is inscribed into the very institution of anthropology and into the structure of ethnographic film’ (1994: 63). So-called reflexive projects such as The Ax Fight have consequently been seen as simply ‘the flip side of the same positivist coin’, in that they still incorporate indigenous voices into an overarching, rational narrative structure while delivering us a spectacle of Otherness (Moore 1994: 129).

Like textual responses to similar critiques, a filmic response to such criticisms has been the autoethnographies contained in films such as Unfinished Diary (Mallet 1983) and Surname Viet, Given Name Nam (Trinh 1989). These films ‘speak from and about the self’ but always by locating the self within a wider web of other selves (Nichols 1994: 76). They present first-person experiences of migration and diaspora, showing a world that is far from being a distant other, but part of the self’s remembered (and imagined) past. Stereotypes and received ideas of other places can thereby be acknowledged and challenged through a narrative ‘I’ that foregrounds and exposes the disjunctures and conflicts of self-identity. The personal, emotional and subjective aspects of life are thereby brought to the fore. In fact, they constitute the very basis of these films’ claims to authenticity. Increasingly, what this means is that the authority, and authorship, of the ethnographer-filmmaker as outsider becomes undermined, even redundant – or at least shown to be partial or incomplete. In that sense, there is currently more space for film produced by the self, about the self, rather than film produced by a quasi-scientific denial of self, about the Other.

This kind of unease with the classical ethnographical project of cross-cultural interpretation, has led many to seek a solution in indigenous video, arguing that it is ‘time to hand the camera over’ (Moore 1994: 127). In Brazil, for example, the Kayapo indigenous tribe of Brazil has produced their own videos for countering Brazilian Government development projects on their land, such as the building of a hydroelectric dam. They have also used video very effectively for documenting their own rituals and traditions for safekeeping. However, as Moore (1994) contends, while the political value of projects such as these are obvious, indigenous film is usually about the portrayal of self for the self. In other words, it is oriented towards the recording or documenting of one’s own cultural traditions, and is not, as a result, about cultural translation. This side-steps what could be argued to be ethnography’s central goal – that of mediating between the world-views of different cultures. Handing the camera over is,
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perhaps, an easy way out of the ethnographer's dilemma. This has led some to see the future of ethnographic film as rather lying in radical, avant-garde films committed to continuing to grapple with the difficult project of cross-cultural interpretation.

Ethnography in the hypermedia age

Ethnography that remains committed to the project of cross-cultural understanding will need to fashion, we suggest, a set of approaches that are more suited to the representation of multiple perspectives. It is clear that if ethnographers and qualitative researchers are to respond to new perspectives such as those we have just outlined, then they will wish to explore new ways of constructing their representations. Bringing text and images together into one authoring platform is one way of doing this, through fusing, or perhaps juxtaposing, their differing communicative powers. This may lead to the emergence of new kinds of qualitative and ethnographic insights resulting from the integration of a number of different media – including sound, visuals and written text. Likewise, qualitative researchers may wish to encourage ways of reading that are more open, more exploratory and less linear than the conventional monograph or film. Hypertext's multi-linear structure represents one way of constructing this openness. Hypertext and hypermedia, we suggest, allow one to create more 'open' or 'multi-voiced' texts that are nevertheless based on rigorous and thorough methods of data analysis.

It is not necessary to endorse all the postmodernist, feminist and post-paradigm critiques discussed in this chapter in order to recognise the value of research and representations that allow for a plurality of analyses and interpretations. Likewise, it is not necessary to subscribe to the more extreme versions of textualism in ethnography to recognise that there is room within qualitative research for representations that are more open and more complex than conventional texts. We do not fall into the trap of thinking that hypertext is the embodiment of postmodernism, nor that it solves all the problems posed by critics of conventional ethnographic epistemology. We do, however, believe that the tasks of cultural exploration and representation will be invigorated by the systematic exploitation of such approaches. The chapters which follow attempt to outline how this might be done.
In his keynote speech to the Hypertext 1989 Conference, Norman Meyrowitz posed the rhetorical question, ‘Hypertext – does it reduce cholesterol too?’ (1991: 287). Ten years later, Mark Bernstein’s keynote speech to the Hypertext 1999 conference, posed the (non-rhetorical) question ‘Where are the hypertexts?’ These questions, framing the decade that saw the emergence of a global hypertext communications system (the World Wide Web) and the development of affordable, high-powered multimedia personal computers, seem to substantiate the perception that claims about hypertext tend to be full of ‘hype’ but lacking in actual texts. Meyrowitz warned that ‘we may be so excited about the perceived potential [of hypertext] that we miss some of the real advantages and some of the real impact that hypermedia and hypertext could have’ (1991: 287). Our intent in this chapter here is to consider the impact that hypermedia and hypertext have already had. (The future will have to wait.)

A difficulty in discussions of hypertext is that it is differently defined by different writers, who also frequently make different kinds of distinction between hypertext and hypermedia. The classic definition of hypertext, as stated by the inventor of the term, Ted Nelson (1981: 0/2), is simply ‘non-sequential writing’. The problem with this definition, however, is that it is, at heart, a non sequitur; writing is always experienced (whether by author or reader) sequentially. Nelson’s definition was intended to demonstrate the difference between a ‘normal’ text which is intended to be read in a linear pattern from beginning to end with a ‘hypertext’ which is intended to be read in a variety of sequences. In this sense, a hypertext can be seen as a collection of texts – sometimes referred to as ‘lexia’12 – linked together so that a reader can choose whatever order the constituent texts are to be read in. In a printed text there is generally just one linear reading order, and each element of the text is laid out in a spatially and temporally ordered sequence (i.e. page two follows page one, and is followed by page three). In a hypertext, this spatial proximity of textual elements becomes irrelevant. What is important are the links connecting the elements.
The notion of hypertext has generally been tied to the computer. For example, one of the simplest proposed definitions for hypertext is Jay David Bolter’s statement that ‘hypertexts are electronic documents, read on the screen of the computer’ (1991: 21). More recently Bolter has refined this definition by referring to hypertext as a type of ‘electronic writing’ (2001: 32–4) that he terms a ‘remediation’ of print. This is similar to Espen Aarseth’s (1997) conceptualisation of ‘cybertexts’ – a category containing all computer-mediated texts, including hypertext. In this paradigm, hypertexts exist alongside computer games, wordprocessing programs, email and chat programs as computer-mediated texts. A hypertext, when understood this way, is therefore a particular type of electronic text.

For many of the leading hypertext theorists, though, the computer is merely an enabling technology – a platform. Even Ted Nelson stated only that hypertext is ‘best read at an interactive screen’ (1981: 0/2 emphasis added). Theorists such as George Landow ground the idea of hypertext in poststructuralist theories of the open or ‘writerly’ text (1997: 2–5) generally associated with scholars such as Barthes (1975). In addition, Landow claims that contemporary academic devices such as endnotes and bibliographies can function hypertextually but that the lack of immediate access to the referenced text diminishes the reader’s ability to appreciate what they bring to the primary text. The computer, then, is simply a medium which allows one to ‘click’ on a hypertextual reference and immediately access the referenced text or quote in that text, possibly at the same time as keeping the referent viewable. For this reason, Landow (1997) refers to the convergence of critical theory (poststructuralist notions of what constitutes a text) with technology (the computer) in the realisation of hypertext.

The convergence model of hypertext can be said to form the mainstream of theory about hypertext. This model is expanded by Jeff Todd Titon, who states that:

Hypertexts are non-linear. Several writing spaces can appear on the screen simultaneously … In a hypertext, the reader is always offered multiple pathways through the information, and the reading will be different depending on which pathways are chosen and what is read and not read. (1995: 441)

The problem with definitions like this one, which posit non-linearity or non-sequentiality as the defining attribute of hypertext, is that hypertexts will always depend on some degree of linearity. Whether this takes the form of paths taken through the hypertext by readers, or paths mapped out in advance by the author, there will always be the possibilities of linear movement traced through the hypertext itself. It is more appropriate, perhaps, to think of hypertext as multi-linear and multi-directional rather than non-linear or non-sequential.

Our definition of hypertext conceptualises it as a form of text that is computer-mediated and which contains authored links that create associations between it and other texts. Although other forms of technology could (and probably will in future) potentially provide hypertextual functionality, for the present the personal computer is the most viable and obvious medium for the creation of hypertext(s). Similarly,
although a case could be made for seeing traditional scholarly tools – such as the footnote – as acting in a hypertextual manner, this is perhaps better seen as hypertext’s ability to handle referencing, rather than the footnote being some evolutionary step on the way to the hypertext age.

The term *hypermedia* is conventionally used to describe hypertexts which incorporate media other than printed text, such as video, photographic images, sound, graphics, and so on. Nielsen (1997) suggests keeping the term ‘hypertext’ for all systems, regardless of the media they use. Landow (1997) uses the terms hypermedia and hypertext interchangeably. We adopt a slightly different model, as we wish to draw attention to the specific authoring dimensions involved in producing *multimedia* hypertexts. Accordingly, we use *hypertext* as a general term and *hypermedia* to indicate the presence within hypertexts of multiple media. Where a hypertext contains nothing but written text then we use the term ‘textual hypertext’.

**What’s in a hypertext?**

For our purposes in this book, it is perhaps useful to outline a few key features of hypertext:

1. At its simplest, a hypertext consists of two or more textual entities (often referred to as ‘nodes’), with some method that allows the reader to progress from entity to entity (‘links’). In a hypermedia work, a node can consist of any type of media element.

2. Nodes either side of a link are known as ‘source’ and ‘target’ (or source and destination) nodes. Activating the link takes you from one to the other. As noted above, this journey is not (usually) between two or more simultaneously visible locations (as in the pages of a book) but between a visible ‘here’ and an invisible ‘there’. The source node is always spatially present (on the screen) but the destination node is usually ‘elsewhere’. Hence the indeterminacy of the hypertext reading experience.

3. Links between nodes may be basic or anchored. Basic links simply close one node and open another at its beginning. Links that are ‘anchored’ have either the source or the target (or both) of the link as a subpart of the node. For example, a section in one interview transcript could be linked to a different section about the same subject in another (or the same) node (transcript) so that when the link is activated the new node opens showing only the linked section. We will refer to links with anchors as ‘text links’, but it should be noted that in a hypermedia work, the anchor could be any part of any type of media. A text link may be anchored in a quote from a portion of a transcript that, when clicked, starts playing a portion of a video in another node that is relevant to the quote. Any adequate hypertext authoring system has to be capable of distinguishing between basic and text links.

4. In a hypertext, any node may have multiple links to and from other nodes, and it is this interaction between multiple linking and nodes that creates the greatest
potential, and greatest challenge, for hypertext authors. The power of a hypertext approach lies in its ability to create sophisticated linking between nodes.

5 Links can be named, and indeed a consistent, principled use of link names can help construct a semantic map of the hypertext. Giving the link a name can allow the name to express a relationship between the two linked nodes; so, for example, a link between two nodes may be named ‘heritage’ to show that the relationship expressed between the nodes is to do with heritage. Named links can also serve a rhetorical function. For example, it is possible to create links that ‘support’, ‘refute’, ‘exemplify’ or otherwise comment on propositions contained in nodes. By using the appropriate link name the reader can be made aware of what relationship the node at the ‘other end’ of the link bears to the current node (see Barbules 1998). There are, of course, many different possible link functions. Links can also be used disjunctively by taking readers to other nodes without obvious relationships, as a challenge to narrative closure. Links can also function lyrically, aesthetically and narratively.

6 Links can be ‘conditional’ or ‘dynamic’, rather than being static. A conditional link is one that has different targets depending on whether certain conditions have been met elsewhere in the hypertext. This is a primary tool for hypertext fiction writers in order to allow changes in both source and target nodes to occur, depending on how much of the plot has been encountered so far. Dynamic links are those that can be turned on and off depending on specified factors. For example, consider a character, ‘Lucretia’, who has just died in a hypertextual murder mystery (i.e. the reader has just read the node containing Lucretia’s death). Dynamic links allow the writer to ensure that, having encountered her death in one node, the reader does not then stumble on a node in which she is still alive. Although dynamic and conditional links have been of most use as a literary device among hypertext fiction writers, there are many possibilities for their use in creating new types of ethnographic writing.

7 Basic links can be used to create a default option at each node. For example Michael Joyce’s hypertext novel, *Afternoon: A Story*, makes extensive use of basic links that can be triggered by hitting the ‘enter’ key on the keyboard alongside text links (Joyce 1996a). This way, if a reader is not sure which text link to choose they can always take the default option to see what happens next. Conversely, in her hypertext *Cyborg*, Greco (1995) refuses to implement basic links, forcing the reader into making active choices at every step. In academic writing, basic links can be used to provide the information that the author feels is fundamental to the argument s/he wishes to present. They also provide the reader with the security of knowing that there is always ‘somewhere’ mapped out to ‘go’.

8 A more complex use of links comes from using link naming to create ‘paths’ or ‘trails’. These are collections of nodes that are referenced by links of a certain name. Each node is then conceptually part of a theme or subject and the reader may choose to follow this path in whole or part to explore its subject. For example, one of the paths in our ethnographic hypertext, which we called ‘Transformations’,
concerns the transformation of an old colliery into a living heritage museum. The reader can use the link name to ensure that they are still following the path or can choose to explore other information they want to instead.

In the Rhondda hypertext we work with two paths which we call ‘tours’. The reader's first interaction with the hypertext, after the opening sequence, is in an introductory node called the ‘reception’. Here readers can choose whether to progress to a ‘tour hall’ to choose a path, or progress to the data area and explore the linked data in their own way. Paths can, therefore, provide local structure within a hypertext. Paths, and the ability to inspect them, also provide the main tool for the use of hypertext in qualitative data analysis. As the researcher starts to connect the data, using named links, they can inspect the paths that are being traced through the hypertext and use that to refine the linking.

It should be noted, however, that link technology is still in its infancy. The most commonly used form of hypertext, HTML on the World Wide Web, can handle basic and text links but has no simple way of managing conditional or dynamic linking or creating names for links.16 A widely used authoring package for hypertext, StorySpace, has most of the features discussed above, but hypertext authors are always looking for new forms of link capabilities, such as the ability to preview the destination of a link before selecting it.

Hypertext routes

Three research trajectories in hypertext are readily discernible. One trajectory has focused on the use of hypertext as a form of informational retrieval and management. This trajectory was first inspired by Vannevar Bush and is best exemplified, presently, by the World Wide Web. The second trajectory is the use of hypertext and hypermedia as an educational tool. The third trajectory has focused on hypertext as a type of literary authoring device and has become associated with theorists such as George Landow and Jay David Bolter. Clearly, there are complex and intertwined relationships between the three areas, although it is also helpful to consider them separately.

Route I: From memex to the Web via Xanadu

The first notable attempt to conceptualise what would become known as a hypertext system was Bush’s ‘memex’ (1945). In the immediate aftermath of the Second World War there was an increasing interest in information retrieval. Bush believed that the contemporary library systems, with their hierarchical index cards, would prove inadequate for the needs of researchers. He proposed the creation of a machine he termed the ‘memex’ that would function as a personal information system. The memex, looking somewhat like a desk, would have a device for scanning documents and another device that would create links between different documents. Each link would be given
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a label and the user could then search for links with the same label to create ‘trails’ through several documents. These trails could then be saved and would, in theory, become useful documents in their own right. The rationale behind this approach to indexing documents was the concept that our minds do not work in a hierarchical manner as do library catalogues but through the association of ideas. Bush reasoned that technology that works in the same way as the brain would be more natural to use, hence the title of his article, ‘As we may think’. Although many of Bush’s concepts seem very familiar to us now, his ideas were revolutionary for their time. Unfortunately for Bush, the technology required to build a memex was not available and interest in his ideas lapsed. At the same time, Bush was an engineer, not a librarian, and library science as a discipline seemed relatively uninterested in his proposal.

It was the self-proclaimed computer radical, Ted Nelson, who resurrected Bush’s idea as the basis for ‘Xanadu’. Living on the West Coast of the USA in the 1960s, Nelson, although not by any means a computer expert, was interested in the use of computers to provide freely accessible information. Nelson was a leading proponent of what became known as ‘hacker culture’ with its motto of ‘information must be free’ (Levy 1985). In particular, Nelson was interested in widening access to classical literary texts via a computer network ‘docuverse’ that he termed Xanadu. For Nelson, Bush’s idea of the associative link was the ideal manner in which to navigate this docuverse, and he coined the term hypertext to refer to the texts linked together in this manner. Nelson, however, foresaw an extra dimension beyond the ability to create and use trails in the docuverse. In Xanadu, users could annotate, link or alter stored texts so that when a user read the ‘original’ of the text s/he could also access all the alterations as well. Xanadu has never been built, though Ted Nelson is still hard at work promoting it, but it was the first fully conceptualised collaborative hypertext.

Both Bush and Nelson saw hypertext as a referencing tool that would provide a degree of flexibility not possible with the type of hierarchical indexing system generally used in libraries. Although Nelson’s Xanadu had an explicitly ideological aspect that was lacking in Bush’s model, both envisioned hypertext as a more creative, ‘natural’ form of referencing that could cope with an ever-increasing amount of available information. Neither system was ever built, because, in both cases, the idea outstripped the ability of the technology to implement it. It would not be until the advent of affordable, powerful home computers and the development of the internet that it would become possible to create large volume, collaborative hypertexts.

An alternative trajectory to the use of hypertext as a bibliographic referencing system emerged in the 1960s. Starting with Englebart’s ‘Augmentation system’ (Englebart and English 1968) an interest developed in the use of hypertext as a writing and idea development system. Both Bush and Nelson had seen the act of creating trails as fundamentally creative; indeed, Landow claims that Bush ‘assumed that science and poetry work in essentially the same way’ (1997: 10). Although large volume collaborative hypertexts were not feasible due to the lack of technology, it was possible to program smaller hypertext systems that focused more on the use of hypertext as a writing aid on mainframe computers. This development lead to the creation of
several hypertext authoring tools throughout the 1970s and 1980s. These software packages could be used to create small, bounded hypertexts or to link together various different documents on the same computer in a hypertextual format.\(^{18}\)

Small volume hypertext gained additional impetus with the advent of home computers in the late 1970s and early 1980s. In particular, the Apple corporation which had long promoted the creative abilities of personal computing developed a hypertextual computer program *HyperCard*, which, initially, it offered free with the purchase of an Apple Macintosh computer. Although not specifically marketed by Apple as a hypertext system, *HyperCard* allowed users to enter information on different ‘cards’, create ‘stacks’ of these cards, and then link different cards, or portions of cards, together in an associative manner (Nielsen 1990). Because cards could contain any type of information, it was possible to link different media types together. The program seems to have been popular and, indeed, a group of North American anthropologists used *HyperCard* as a way of managing fieldwork data and journals (Fischer 1994). There does not seem, however, to have been any sustained research effort generated that centred on the use of *HyperCard*.\(^{19}\)

Two non-commercial systems were also developed at academic institutions during the 1970s: *Guide* at the University of Kent, Canterbury, and *Intermedia* at Brown University in the USA. *Guide* was distinguished by its use of a form of hierarchical hypertext; buttons allowed users to ‘unfold’ texts or display ‘notes’ about a specific piece of text (Nielsen 1990; Rada 1991; Weaver and Atkinson 1994). *Intermedia* took a very different approach and can be seen as the first attempt at creating a truly collaborative hypermedia environment (Nielsen 1990; Yankelovic et al. 1988).\(^{20}\) *Intermedia* consisted of a series of programs linked together that allowed a user to create and edit text, graphics and video data in different files and then build links between those files. In addition, it was possible to examine the nodes and links of the resulting hypertext graphically, in what was termed a ‘Web view’.

These systems embodied very different notions about hypertextuality. *Guide* treated hypertext as a type of electronic outlining device. Its developer stated in an email, ‘the model is very much a structure that can be expanded out at any level, rather than a maze of links’ (Brown, personal communication, 17 June 1998). Consequently, *Guide*’s repertoire of link functions and types were focused around hiding and revealing text. *Intermedia* was almost a polar opposite; the idea behind this program was to encourage messy, unstructured screens full of links and windows. In this way the developers, says Landow (1997), were experimenting with the idea of hypertext as writerly text, forever resisting closure and breaching its own boundaries. *Intermedia* was developed to assess Landow’s claim that the most interesting feature of hypertext was ‘not that it may fulfil certain claims of structuralist and poststructuralist criticism but that it provides a rich means of testing them’ (1997: 36).

Although *Guide*, *Intermedia* and *HyperCard* are currently defunct, the interest in hypertext authoring systems has been maintained through Eastgate’s program *StorySpace*. As *Intermedia* was inspired by Landow’s concept of hypertext so *StorySpace* was inspired by Bolter’s, particularly the notion of the ‘writing space’ (Bolter 1991, 2001).
StorySpace focuses less on the multimedia possibilities that marked both HyperCard and Intermedia and instead concentrates on handling links and text spaces. In the last decade it appears to have become the tool of choice for most hypertext writers and development of the program is ongoing.

The last decade has also seen two main developments in the field of hypertext and hypermedia. The most obvious has been the emergence of the World Wide Web. Alongside this, the increasing availability of powerful personal computers has encouraged the development of stand-alone hypermedia authoring software such as Authorware, Director and Toolbook. These two strands have combined with the development of programs such as Flash and Shockwave, which allow the playing of complex hypermedia on the Web.

These hypermedia authoring programs have become viable due to the increasingly sophisticated and powerful multimedia abilities of personal computers. There have been many such programs developed in the last few years, most of which have not survived for long. The market leader has been Director and its producers, Macromedia, have become by far the dominant company in the field. Unlike programs such as Intermedia and Guide (and to a lesser extent StorySpace) which were developed firstly as intellectual exercises, these hypermedia authoring packages have been developed for mainly commercial reasons. Consequently, they are oriented around sophisticated media manipulation and have, very successfully, marketed themselves for the production of everything from interactive music videos to online games and sales catalogues.21

Other programs, such as Authorware, have been focused more on the field of Computer Assisted Learning (CAL). As contributions to the field of hypertext scholarship, the interest in the commercially oriented programs lies, mostly, in the technicalities of handling multimedia. Their development has, however, brought to light various new issues in hypermedia theory, mostly to do with conceptualising links between different media types as well as the different concepts for how to implement hypermedia authoring. These are topics to which we will return later.

It is the growth of the World Wide Web that has made hypertext a part of everyday life for more and more people, especially in North America. Links, bookmarks, URLs and search engines have become commonplace terms over a period of just a few years and the Web's influence on contemporary life is profound. It is perhaps surprising then that its main developer, Tim Berners-Lee had never heard of Ted Nelson or Vannevar Bush when he first conceived of the Web (Berners-Lee 2000: 5–7). Berners-Lee first conceived of the Web as an information retrieval mechanism for the internet.

In the early 1990s the internet was experiencing exponential growth in usage and the number of computers being connected to it, but the problem was that no-one knew where anything was. Catalogues of online material tended to be held on different computers in different formats. The privatisation of the internet by the American government meant that any centralised index became infeasible and anti-theoretical to the aims of making the internet a distributed resource (Abbate 1999).
Although there were some information search-and-retrieve tools available (e.g. a hierarchical indexing system called ‘Gopher’), they tended to be hard to use and required institutions to expend labour in creating and maintaining hierarchical indices that might become outmoded in a matter of weeks. There were many proposals in this period to adopt or invent certain standards that would facilitate information retrieval on the internet but all of them required the conversion of pre-existing documents. Berners-Lee proposed the creation of a ‘mark-up’ language that could describe any document which was to be stored on the Web. In this way each document merely needed a small number of codes added to its beginning and end and then it would be ready for retrieval from the Web. Mark-up languages were already well known and widely used, and Berners-Lee adapted a version known as Standardised General Mark-up Language (SGML). He extended SGML by adding in features that implemented hypertext links so that any part of the document could be linked to any part of another document. Rather than having to browse up and down an index a user could simply click with a mouse and download a different file to the computer. This new mark-up language he titled ‘Hypertext Mark-up Language’ (HTML). Although there are some similarities between the Web and Nelson’s concept of a ‘dociverse’ it is a very different type of thing. As with Xanadu, at first Berners-Lee intended the Web browser program to be a combination clipboard and document reader. In theory you would view the page and make annotations directly to it. There would have been no real distinction between reading a Web page and writing one. The commercial orientation of the Web has, however, made that vision currently untenable.22

The Web has become the first truly widespread hypermedia environment. The problem is that it was intended to be a document retrieval system, and there was relatively little interest in how the document looked once it was retrieved (the ability to play digital video and audio was a non-issue when the Web was first designed). Consequently, using it as a medium for constructing hypermedia is somewhat problematic. Web developers have solved these problems, to an extent, through the invention of Java, a portable programming language that can be run on any computer and the development of ‘plug-ins’ that can enhance a Web browser and let it play specific content. Most multimedia that can now be accessed on the Web is either accomplished through a Java program or a plug-in (such as Flash or Shockwave). There is a Web consortium research team working on producing a mark-up language for multimedia – SMIL23 – but so far their work does not seem to have received the attention it deserves.

The other problem with the Web is that it is a fairly primitive hypertext system. Although the linking system allied with history lists and bookmarking makes for a decent navigation system it can still be extremely difficult to find things on the Web. In addition, the link system is rather basic. Although following links is fairly straightforward, the ability to create them is not, and the Web lacks good hyperlink authoring tools. Some of these deficiencies have been addressed by third parties. Search engines such as Google or index systems such as Yahoo! have become ubiquitous.24 An experimental search engine named Kartoo (cited 24 June 2002) is able to provide graphical views of Web pages along with semantic relationships between them.25
On the whole, though, the types of advanced hypertext functionality that authors expect as standard from programs such as StorySpace tends to require advanced programming skills for implementation on the Web.

**Route 2: Teaching with hypertext**

Hypertext and hypermedia have also been developed for education and training, both in the public and private sector. Educational hypermedia systems are aimed at transmitting and testing information in a structured way. Computer-based training (CBT) and computer-assisted learning (CAL) programs utilise hypermedia to create controlled environments with the ability to test the users. In this case hypermedia/hypertext has become popular because it is easier to control and survey hypermedia users than book readers. For example, during our research we interviewed an outside consultant in environmental risk management who had been tasked to generate an Environmental Management System (EMS) for a UK aluminium producer. As he explained to us, European Union policy requires that the company must possess a quantifiable training system for workers at the plant about the EMS. The consultant therefore decided to produce a hypermedia tutorial – with associated tests built in on the grounds that, unlike a book that a worker could simply ignore, a hypertext requires the worker to sit down at a computer and activate it. In addition, by continually asking the user to press keys to continue as well as answering regular questions, the user had to interact with the computer in order to get to the end. Because the hypertext used timed speech files, the user was unable to skip past sections and was forced to plough through each section. Even the ‘back’ button option, which allows a user to return to a previous section, was removed. Supervisors were always on hand to ensure that the user was proceeding through the package in an orderly and attentive manner.

Not all instructional hypertext programs are as highly controlled as this. For educationalists, hypertext and hypermedia have become part of a wide-ranging debate about the use of computers in education. The use of hypertext/media tends to reflect the educational theory being practised. Researchers from a poststructuralist paradigm have tended to focus on the ability of hypertext to encourage more creative exploration of ideas (Joyce 1995; Landow 1997), while others see the strength of hypertext in its ability to create programmed, testable learning environments (see Scrimshaw 1993). Much educational hypermedia software has focused on providing testing and feedback facilities in which the ability of the student to read ‘against the grain’ is limited (Barbules and Callister 2000: 60). Although there is a large literature on the use of computers in education, when it comes to hypermedia the main debate centres on the relationship between control and freedom in the medium. Scrimshaw suggests that ‘what the medium of hypertext provides is an infinitely adjustable level of control over the relative power of the user and the designer to determine the text that is read’ (1993: 182). Barbules and Callister (2000: 61–6) expand on this by arguing that different types of hypertext are suitable for different types of students.
Presently, the momentum in educational hypermedia appears to favour Web-based presentations, especially when combined with remote learning schemes. The major software packages that focus on CAL hypermedia have become noticeably better at exporting their presentations to a Web-mountable format. Some of the more noteworthy examples, such as George Landow's *The Victorian Web* (2002), which has been converted from *Intermedia* via *StorySpace* to the Web, are intended to facilitate creative exploration and collaborative expansion. The Victorian Web is a good example of an expanding hypertext that presents material about Victorian society for use by students. It is possible to submit additional material to the Web page and the information there is presented in clearly defined units. A student can therefore explore on their own or be tasked to read specific parts of the Web site.

**Route 3: Hypertext fiction**

As with any medium of expression, hypertext is amenable to a variety of rhetorical strategies and literary devices. To date, many of the major investigations into experimental hypertext writing have been carried out in the field of fiction, by authors such as Michael Joyce (1996) and Stuart Moulthrop (1991). Explorations of the use of hypertext for academic writing have also appeared, though this is still only a fledgling genre (see for example David Kolb's philosophical hypertext, *Socrates in the Labyrinth* (1994) and Diane Greco's cultural study of cyborgs (1995)).

The field of hypertext fiction is encapsulated by two well-known works that represent polar opposites in the ways in which narrative is controlled. Joyce's *Afternoon: A Story* (1996a) is a hypertext that uses a variety of control mechanisms to ensure that the reader is directed down certain paths. Often the reader will appear to return to a node already visited; however, the links from that node will have subtly changed (through ‘dynamic’ linking, see above) so that clicking on a previously selected link may well take the reader to a different destination. An alternative approach is taken by Stuart Moulthrop in his hyperfiction text *Victory Garden* (1991). Written partly as a response to *Afternoon*, Moulthrop's novel allows the reader almost complete freedom of action. The entire hypertext is represented in a map of a garden maze; by progressing around the map the reader can perform the equivalent of visiting several intertwined narratives. The tension between control and freedom, as exemplified in these two approaches to hypertext fiction, has been a keen source of debate for authors.

*Afternoon* starts with a node that muses about poetry and recollection to an unnamed listener. Nineteen ‘hidden’ links within this first node lead to various parts of the hypertext, and following any of them accidentally can disorient an incautious reader. The twentieth link, however, is a basic link that is triggered by taking the default action of pressing the ‘enter’ key; if the reader takes this option then he or she may progress through thirty-two nodes taking the default option each time. By so doing the reader gains a base-level insight into the characters and plot of the novel. Once the end of this default path has been reached the reader must then backtrack and investigate various text links to experience the story in more depth; pressing the
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enter key provides no more nodes until the reader finds a new section of the hypertext to explore.

Joyce’s intent in his novel is to re-create the protagonist’s sensation of disorientation and lack of knowledge within the reader. The central issue for the protagonist is to discover whether his child and ex-wife died in the car crash he saw during his journey into work in the morning. Telephone calls, conversations and reminiscences provide clues but no concrete answers. The protagonist’s confusion is replicated in the reader’s inability to control navigation through the hypertext. The links are hidden, forcing the reader to click blindly in hope that something new reveals itself. Once a new node is discovered, pressing the enter key will usually reveal some further default entries until that path is exhausted. At any given time it is never clear whether or not you have reached the novel’s climax. In its interaction with the reader, *Afternoon: A Story* feels as much like a textual ‘adventure game’ played on a computer as it does a traditional novel. Where, however, a traditional adventure game sets puzzles to be resolved until a climax is reached, *Afternoon* refuses to allow that sense of closure. As such, the hypertext takes advantage of the computer not to produce a more writerly text or to give the reader the ability to break apart the text but to control what the reader can do and reduce the information available.

By contrast, Stuart Moulthrop’s hypertext *Victory Garden* invites the reader to take whatever path they prefer. Moulthrop provides a map of the ‘garden’ and encourages readers to explore their own route around the novel. That said, there are still several control features implemented. As with *Afternoon* the links are hidden, though can be revealed, and some use is made of conditional links. Where *Afternoon* feels like an adventure game, *Victory Garden* feels somewhat like a jigsaw as the reader gradually completes the hypertext. Both however take advantage of the playful possibilities of hypertext to produce an art form that is specific to the medium. Although *Victory Garden* is less controlled than *Afternoon*, both novels have different structures and, indeed, aims, than the average ethnography. The novels are intricate puzzles requiring mystery and subterfuge to fuel the narrative pace. The extent, however, to which they succeed in creating and maintaining narrative engagement on the part of readers is open to debate. For some critics, there is a fundamental incompatibility between narrative pleasure, classically defined, and the interactive text: ‘Empirical studies have shown that when readers are motivated by the desire to know how it ends – the primordial narrative desire – and when they can find out by hitting the return key, they will experience the other links as a distracting nuisance’ (Ryan 2001: 257).

Ryan suggests that interactive texts are better suited to the kind of writing that is not dependent on generating the desire to know how it all ends, but on creating a text replete with local variations. In such a text, clicking will deliver a myriad of ‘microevents’ – interesting discoveries and ‘morsels’ that the reader can activate without becoming irrevocably diverted from the overarching narrative structure. In addition, such texts can take full advantage of the non-lettered modes of representation implicit in hypermedia and offer innovative explorations of the inter-relations between sound, image and written word. Indeed, Joyce’s more recent works, *Twelve...*
Blue and Twilight: A Symphony make extensive use of graphics and images, and, in the latter case, video clips, music and other sounds.

The loss of narrative cohesion inevitably presented by hypertext poses different kinds of problems for ethnography and qualitative research, as opposed to fictional writing. Rather than being primarily a problem of reader distraction (though this, too, may well present barriers), in interactive academic writing the loss of narrative cohesion can simply result in confusing and unreliable exposition. Interactive hypertext structures can easily undermine the conventional academic norms that call for transparency in the production of ideas. In ethnographic writing, propositions, for example, need to be evidenced both clearly and explicitly. It needs to be clear how the interpretations were reached, so that the reader can judge their adequacy. Mystery is not usually seen as appropriate. It is as yet far from clear how qualitative researchers and ethnographers can resolve these problems while retaining the interactivity that lies at the heart of electronic writing (we offer some further thoughts on this in Chapter 8).

A more transparent approach to fictional hypertext writing is taken by Deena Larsen in her collection of hypertext short stories Samplers (1996). Like Joyce and Moulthrop, Larson produced the hypertext using the StorySpace hypertext authoring program. Unlike them, however, she allows readers to view and navigate the hypertext graphically through a map window. This is, in fact, a key element of the work, because when a map view is used it reveals that the nodes themselves are arranged in patterns that replicate the quilt ‘sampler’ images used for each of the short stories. For example, Figure 1 shows a map view of the hypertext mystic knot in which it can be seen that the nodes of the hypertext are arranged in a pattern that re-creates the knot image. This manipulation of hypertext structure is something that has been associated predominantly with fiction hypertext writers and is a technique that we made use of when producing our own hypermedia ethnography.

The hypertexts discussed above were all produced using StorySpace and consequently took advantage of, as well as being limited by, its abilities. In all of the hypertexts, the reader can save ‘readings’. This means they don’t have to start at the beginning each time they open the hypertext. They can bookmark nodes in order to return to them later, make margin notes to add their own commentary to the hypertext and call up a history screen so that they can see which nodes have been read. The program, however, is limited in two ways. The lack of multimedia, apart from basic graphics, enforces a focus on written text. In addition, it is a stand-alone program. One of the intents of hypertext is the ability to link beyond the present hypertext into a wider universe of texts; in practical terms this means the capacity to link directly to Web pages.27

Recent developments

Hypertext on the Web

The advent of the World Wide Web has opened up new possibilities for hypertext and, more recently, hypermedia fiction. Although the Web lacks some of the hypertext
sophistication that is native to programs such as StorySpace and is more complex to use, it does include the ability to link externally as well as integrating multimedia elements. In addition, its prevalence and familiarity in contemporary computing culture means that users have become accustomed to the standard hypertext features it incorporates (for example anchored links, navigation toolbars, history lists and bookmarks).

Deena Larsen's *Disappearing Rain* (2000) demonstrates some of the possibilities available for Web-based hypertext fiction. The work is based around two kanji – the Japanese pictograms for river and rain – and a puzzling disappearance. By clicking on different parts of the kanji or selecting text links, the reader can explore the mystery. Unlike a self-contained hypertext, certain links in *Disappearing Rain* can take the reader elsewhere on the Web. For example, the node ‘their sides dissolving’ and the text, ‘and there were no matches at Yahoo’s people search’, contains a link which goes directly to the Yahoo people search Web site. Compared to previously published hypertexts, the hypertextuality of *Disappearing Rain* is somewhat basic in its use of links. There is no ability to annotate nodes and very little in the way of complex linking patterns. The ability to change the destinations of links and deactivate links until certain conditions have been met has been implemented but it required specialist Java programming. In addition, although the kanji are clickable image maps (clicking on different parts of the kanji takes the reader to different nodes), they provide the only
non-textual media in the piece. Larsen takes an alternative approach in her hypermedia piece *Intruder* (2001). This short piece is presented as a ‘Flash’ item in an online journal. In a reverse to most hypermedia, *Intruder* penalises the reader for clicking by ending the piece prematurely. The only way to experience the entire piece is not to click unless in response to a specific stimulus. By using Flash, Larsen can generate animated text and images that respond to the user’s positioning of the mouse and what the user clicks on. *Intruder* is an example of a piece of interactive artwork that is not easily classified.

An ambitious Web-mounted hypermedia production is Mark Amerika’s *Grammatron* (1997). He describes it as a ‘public domain narrative environment’ containing ‘over 1100 text spaces, 2000 links, 40+ minutes of original soundtrack delivered via Real Audio 3.0, unique hyperlink structures by way of specially-coded Javascripts, a virtual gallery featuring scores of animated and still life images, and more storyworld development than any other narrative created exclusively for the Web’ (1997). As with many hypertext works, *Grammatron* explores issues of freedom and control. When it is first encountered the reader must watch 91 nodes appear sequentially before taking any action. Once this opening sequence is complete, the reader can navigate the story hypertextually, experiencing a mixture of video, still image, sound and text. The use of sophisticated programming means that the destinations of links change depending on previous choices. Compared to *Intruder*, *Grammatron* is more a hypertext with extra media elements. At most times in *Grammatron*, the other media support the written text or add depth to what is written but the text is the primary focus. Preventing the visual from becoming simply illustrative in a hypertext requires a complex balancing act. For example, in the award-winning *The Ballad of Sand and Harry Soot*, Strickland (1999) uses images and font colours to counterpoint the text. However, in that case, there is nothing in the format of the piece that could not be presented on colourful paper; indeed it is the printed version of the poem that won its awards! Perhaps that indicates a central paradox about hypermedia fiction on the Web, to date.

**Hypertext non-fiction**

Hypertext non-fiction authors are also beginning to explore the different possibilities for hypertext. Whereas fiction writers have focused on the ability to expand the notion of the text and narrative, a small number of non-fiction writers have looked to challenge the nature of scholarly argumentation and rhetoric through the use of hypertextual devices (e.g. Bolter 1991; Greco 1995; Kolb 1994). Although hypertext is often associated with poststructuralist and postfeminist literary theories it is perhaps ironic that much of the innovation has come through the exploration of discursive structures within hypertext.

David Kolb explores various hypertext structures in his collection of hypertext articles *Socrates in the Labyrinth* (1994). Writing as a philosopher, he is keen to explore the effect of hypertext on philosophical argument. He experiments with different kinds of hypertext structure, in order to explore the connections among different ideas. Perhaps the most convincing structure he creates, and the one that has been widely
adopted, is the ‘cycle’. Here, after following a path, the reader ends up back at the beginning. This is fundamentally the same structure that Joyce uses in *Afternoon*; however, Joyce hides the ‘looping’ from the reader and tends to mutate it so that when one returns to a node in the cycle the next step might not be the same each time. Kolb keeps the cycle stable but expands on it by introducing subsidiary cycles for each node. In this way the hypertext ends up with a main cycle that appears to be orbited by a series of other cycles. Kolb also explores the possibility of a pyramidal structure of hypertext in *Socrates in the Labyrinth* (1994). The top level consists of a series of postulates, each one of which is a link. Selecting any of the links takes the reader down a step of the pyramid into a more detailed set of postulates, each of which is also clickable to move down a further level and so on until the bottom of the pyramid is revealed. In theory, then, the reader can progress either vertically or horizontally through the hypertext. Although the focus of Kolb’s work is on experimenting with different hypertextual structures, each hypertext shares his use of names for links.

Kolb’s *Socrates in the Labyrinth* was produced using *StorySpace* and consequently supports paths and the ability to interrogate them. A path, in this case, is simply a list of all the nodes that have links with the same name to or from them. For example in Figure 2 a hypothetical hypertext, node A is linked to node C via a link called ‘foo’ and node E is linked to node F by a link of the same name. This generates a path called ‘foo’ which consists of the nodes A, C, E and F. Consequently, even though, nodes A and F are not explicitly linked together they are shown to be related via the presence of links sharing the same name. Through his use of paths Kolb offers the reader routes through the hypertext as well as ‘signposts’—at any time one can look to see what paths traverse the node. His systematic implementation of this feature is an example of how academic argumentation can be presented in an innovative way through hypertext.

![Example of hypertext showing named links](image)

**FIGURE 2** Example of hypertext showing named links
Diane Greco, on the other hand, relies on the actual mechanics of linking in her hypertext, *Cyborg* (1995) to give it a sense of fragmentation. In her introductory notes she states that ‘hypertext animates *Cyborg*’ (1995:15). Like Kolb, she uses *StorySpace* to present her work and, also like Kolb, she encourages the reader to explore the hypertext by allowing graphical views of the hypertext. Interestingly, *Cyborg* is a hypertext revisioning of a printed document: her undergraduate thesis. Although she seems to have made little use of the mechanics of hypertext she has taken advantage of the medium in order to alter the rhetorical style of her writing. Each node in the hypertext tends towards short, provocative sections of text that recreate a feel of ‘cyberpunk’ science fiction in the writing style. In addition, hypertext links to quotes, which are themselves linked to their bibliographic reference as well as to other parts of the text, including other quotes, allow the reader to wander almost randomly through the text. There is no overarching structure to this hypertext: the reader is encouraged to get ‘lost in hypertext’.

Both *Cyborg* and *Socrates in the Labyrinth* use hypertext to embody theoretical concerns. Kolb is interested in rhetorical structures; Greco is interested in the deconstruction of structure. Greco’s approach is one that has become associated with feminist (and postfeminist) hypertext experiments. For example, Page claims that postmodernist, feminist writing ‘is hypertextual in principle and bears relation to discourses of many women writers now working in hypertext’ (1999: 112). The feminist perspective, as embodied in Page’s analysis, is founded on the notion that hypertext ‘prohibits definitive reading; the reader chooses the path of the narrative’ (Page 1999: 123). In this understanding, the printed text is held to be a device that encodes patriarchal/phallocentric notions of what a text should be while hypertext provides a medium to challenge those notions. Page demonstrates this through an analysis of Guery and Petry’s hypertext *Izme Pass* (1999). Invited to work on a collaborative hypertext with Michael Joyce, they instead used *StorySpace* to break apart his work and create spaces for new writing. Wendy Morgan (1999) tries a similar technique in her hypertextual deconstruction of Lather and Smithie’s published research on women living with HIV/AIDS. By breaking apart the monograph into a hypertext she is able radically to revision the text and de-centre many of its assumptions.

Most of the scholarly hypertexts that are readily accessible are, however, merely mounted on the Web and not particularly hypertextual (Stone 1998). On the whole, online journals have used the Web simply as a storage medium and attempted to re-create a paper format online. Our own online publications (Dicks and Mason 1998, 1999) are, indeed, examples of this tendency. Although taking this approach has some obvious merits, it serves to underline the extent to which academic writing, on the whole, has so far failed to take real advantage of the Web as creative medium.

**Hypermedia and ethnographic writing**

Hypermedia offers ethnographic writers many different possibilities. At one extreme, hypermedia allows for interactive, tightly controlled educational ethnographic
presentations that can make for extremely useful classroom resources (Pink 1997, 1999). At the other extreme, hypermedia potentially allows the ethnographer to produce more ‘writerly’ texts (Barthes 1975); offering the possibility of creating different kinds of multiple links between both the assembled data and the interpretative texts which comment upon these data (Howard 1988). Nodes for ethnography, then, can be divided into two types: data nodes and interpretative nodes.

Back in 1988, Alan Howard claimed that ‘hypermedia has the potential for establishing an entirely new kind of relationship between authors and readers in respect of ethnographic work’ (1988: 311). A few years later, Seaman and Williams predicted that ‘the increasing availability of interactive multimedia and hypermedia database systems on personal computers will transform ethnographic methodologies’ (1992: 300). So far, however, the potential of hypermedia has remained confined to a small band of experimenters. It is only now, indeed, that we are starting to see the first examples of ‘interactive’ CD-ROM ethnographies beginning to appear. Most of these have been developed by and from the work of ethnographic filmmakers and visual ethnographers. Examples include Peter Biella et al.’s Yanomamö Interactive: The Ax Fight (1997), Biella’s Maasai Interactive (2005), Robert Gardner’s interactive DVD release of his film Dead Birds (2004), Sarah Pink’s The Bullfighter’s Braid (1997) and Interweaving Lives (1999), Jay Ruby’s An Ethnographic Study of Oak Park and Roderick Coover’s Cultures in Webs (2003). Some of these are discussed further below.

By contrast, there has been relatively little interest in hypermedia within written-mode sociology and other social sciences. With the exception of the works by visual anthropologists and filmmakers, we could echo Mark Bernstein in asking ‘where are the hypertext ethnographies?’ Undoubtedly, the lack of specialist software, allied to the cost of the relevant technology and the enhanced human resource requirements, have made the task of creating hypermedia ethnographies rather daunting. To utilise hypermedia as both visual, aural and written medium is an as yet unexplored field (one which our work is trying to develop). Indeed, the visual ethnographers have seen the potential of hypermedia largely through the lens of the camera. Their CD- and DVD-ROMs (see below) are heavily characterised by film and image, with relatively little in the way of integrated text/image/sound experimentation. This has meant that the complex hyperlinking capabilities in which we are most interested, particularly in multimedia form, have been relatively unexplored.

The earliest interest in hypertext and hypermedia for ethnography was oriented around its use in fieldwork and organising data. For example, Fischer comments on the utility of hypertext programs for the storage of ‘irregular data’ (1994: 40–1), arguing that ethnographic data tends to come in all shapes and sizes. Similarly, Boyd gives an example of how she used a hypertext program (StorySpace) to organise her fieldnotes during ethnographic fieldwork in China (2001). Fully fledged hypermedia ethnographies differ from these examples, however, since they use the CD-ROM itself as an interactive representational space. Biella et al.’s hypermedia ethnography, Yanomamö Interactive (1997) gave a glimpse of the potential of the medium. Maasai Interactive was produced on a CD-ROM using an Apple Macintosh program called HyperCard.34

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(An updated version of *Maasai Interactive* is to be released on DVD-ROM in 2005.) The original CD-ROM contained about 2,000 pages of text, 2,175 images, 8 hours of audio recordings and one minute of video from his fieldwork with the Maasai. These massive amounts of data are stored in a series of databases that are hypertextually linked to interpretative commentaries and assigned readings and exercises. Biella’s intent was for the CD-ROM to be used primarily as a textbook and teaching resource. Accordingly, it shares some similarities in approach to the use of hypermedia in Computer Assisted Learning (CAL). Although Biella traces his intellectual heritage to the work of Landow and Delaney and the hypertext program *Intermedia*, he explicitly designs *Maasai Interactive* very differently. *Intermedia* was designed to encourage ‘textual randomness’ (Landow 2002: 9) while Biella’s hypermedia is ‘committed to non-random, non-broken readings and analyses’ (Biella 1993b: 319). He achieves this by using a different underlying metaphor for his hypertext that is realised through the screen layout. The screen of *Maasai Interactive* is divided into quadrants with each quadrant showing specific types of data. The ‘main text’ in any screen is always placed in the top left quadrant while the three other quadrants provide contextual information about the main text. Consequently, the top left area of any screen is always the primary focus with the rest of the screen providing supplementary information. As the reader progresses through the hypermedia they travel from screen to screen, each new screen providing a new primary focus with its supporting information. Biella describes this as a ‘sedate’ travel metaphor: ‘the computer window is the vehicle for travel to many locations – different files or “screens” – each of which is purposed to feature one particular document’ (1993b: 315). His intent then is not to baffle or puzzle or challenge the reader; rather, he claims that ‘contrary to Landow and Delaney, the consequence of exposure to hypermedia is not necessarily a growing conviction of textual “randomness” or incorrigible “fragmentation”’ (1993b: 320–1). Peter Biella continues this approach with his more recent follow-up experiment, *Yanomamö Interactive: The Ax Fight*. This CD is designed to be viewed alongside a textbook and video documentary of Asch and Chagnon’s classic ethnographic film, *The Ax Fight* (1975). As with *Maasai Interactive*, the screen is divided into quadrants and is designed to be simple to use.35 In both cases, Biella’s travel metaphor facilitates ease of use while providing an element of homology between the fieldworker’s journey to the ‘field’ and the viewers’ journeys through the CD.

Sarah Pink’s two ethnographic CD-ROMs take different approaches to the use of metaphor as a structuring device. Her earlier work, *The Bullfighter’s Braid*, is essentially an interactive article (1997) with associated learning aids, images and video clips. A margin on the left side of each screen contains forward and backward arrows along with a button to return to the previous section. A small number of textual hyperlinks allow the reader to jump to areas of particular interest but, always, the left-hand margin remains present with an indication of which page and which section the current screen is a part. In all relevant ways, *The Bullfighter’s Braid* is as linear as a printed book. Pink’s other ethnographic CD, *Interweaving Lives* (1999) works in a similar manner. Although the contents screen for each section is an animated loom, suggesting a
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weaving metaphor, and each section is titled a ‘strand’, the work still consists of sections and pages within each section.

Although Pink’s CDs suggest some very useful avenues for the exploration of hypermedia ethnography, they focus primarily on the multimedia possibilities in computer technology and make relatively little use of hypertext per se. This is, perhaps, unsurprising, as Pink’s background is in visual ethnography. As with Biella’s *Yanomamö Interactive*, Pink’s primary interest appears to be in exploring the effects of new media on still and moving images. In this respect her work can be seen as a progression from the likes of Kersenboom’s *Word, Sound, Image* (1995), which features an illustrative interactive CD (CD-i) along with the book. Although Kersenboom’s work remains embodied within a conventional, linear monograph, and the CD-i element is explicitly illustrative, she argues forcefully for the further exploitation of such representational possibilities. Her rationale for exploiting contemporary information technology – at least as an adjunct to a printed version – is that: ‘with the advent of CD-i anthropological and linguistic fieldworkers are offered a chance to represent their data, which depend on word, sound and image as their existential condition, as well as their analyses, in one comprehensive exteriorised form’ (1995: xvii). Kersenboom’s empirical work is focused on Tamil oral performance, and she argues that we need multiple modes of representation (written, visual, musical, spoken) in order to appreciate the full complexity of such cultural forms.

A major obstacle to the accomplishment of this aim has been the ability to store and produce video. Interactive CDs were still relatively recent in 1995, and the technology required to create them only became widely available to consumers from 1997. Furthermore, without specialist video capture and recording equipment, a CD can only hold about a maximum of 50 minutes of small, low quality video at most and playing that back on a computer was often problematic. Consequently CDs were something of a technological dead-end for high-quality visual ethnography. Obviously the recent advent of the higher capacity DVD along with advanced new video compression techniques (MPEG-4) has generated new options for the production of visual and hypermedia ethnographies that are already becoming more affordable and accessible.

An alternative approach to packaging a CD with a book was taken by Goldman-Segall in her monograph, *Points of Viewing* (1998). A ‘digital ethnographer’, her work is an ethnographic study of the computer culture of school children within a particular school and her primary fieldwork involved extensive video-taping of the children. As a visual ethnographer she wanted her ethnography to extend the ideas of visual ethnography beyond the book. To do this she created an associated Web site with extensive video clips (1998). A reader can open the Web site, type in the page number of the reference and watch the relevant video clip. It is also possible to leave comments about the video clip for future viewers directly on the Web site. *Points of Viewing* demonstrates the advantages and disadvantages of the Web for this kind of work. The most notable disadvantage is the quality of the video images. In order to ensure that the video can be easily viewed it is tiny in size and sampled at low frame rate with fairly poor resolution; we found that it was almost impossible to see detail
in anything other than close-up shots. In addition the sound quality is quite poor. Essentially it is hard to see and hear what is actually being portrayed, which is something of a drawback when using visual representation. A less noticeable problem was access. When we first accessed the Web site (in 1998) the links were broken. Goldman-Segall explained that this was due to copyright issues with the previous host requiring them to move to a different host (personal communication, 8 September 1999).

The extra advantage of the Web site is that the users’ comments can foster a dialogue that may prove a valuable resource in its own right. Certainly, e-businesses have latched onto the idea of encouraging user feedback to promote a sense of community on online sites. In theory, the addition of a facility enabling user comments extends the book into a collaborative exercise. In practice, however, this facility may not be widely exploited. When accessed on 24 May 2004 only the opening video had any comments from the last two years and most of the other video pages had no comments after December 2000.

There have been some other attempts at presenting ethnographic material on the Web. MERLin, the publisher of Goldman-Segall’s CD-ROM maintains a multimedia ethnographic research lab online (http://www.merlin.ubc.ca/index.html) and various individuals produce homepages. The use of the Web as a medium for the presentation of ethnography is still in its infancy, however. One notable attempt at centralising information about online ethnographies was made by Tennant (1999, 2001). His Los Loros Web site provided useful links to what he termed ‘HTML ethnographies’ as well as providing information about his own ethnographic work at Los Loros. Most interestingly, he developed a piece of software called HyperBuilder that was intended to help ethnographers produce HTML ethnographies (1999). HyperBuilder could be used to generate Web pages from ethnographic material. In this respect it was a presentational tool and was not intended to help with the research tasks involved in social science research. Although HyperBuilder could have become a useful product, it never progressed past the prototype stage, and work on it has been left on hold while its developer works elsewhere in the industry (personal communication, 30 June 2002).

Perhaps the most interesting recent online ethnography is Wesch’s Nekalim.net (2002a). The ethnography utilises the latest innovations in Web-based multimedia to present a wide range of material, including fieldnotes, historical documents, images, video and academic papers. Furthermore, the site uses some sophisticated presentational techniques in order to ‘layer’ the ethnography. Nekalim.net is, to our knowledge, the first academic ethnography that is ‘native’ to the Web. By that we mean that everything about the ethnographic process has been conducted with the aim of presenting the final product online; the author even hopes to upload fieldnotes from the site to the Web page during fieldwork as well as encouraging the local participants and readers to contribute as well. Nekalim.net also demonstrates some of the problems with Web-based work; it requires the very latest programs and computers to view it and a great deal of bandwidth. Conversely the Web site is still, compared to what could be produced with a commercial product (such as Director), rather primitive. That said, it is still under development and, by using the Web as a development platform rather
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than a proprietary commercial program such as Director, Wesch decreases the risk of his work becoming unreadable. As the Web site evolves and the Web itself becomes more advanced we would expect Nekalim.net to provide a good example of what can be achieved in Web-mounted ethnography. Technological difficulties aside, Nekalim.net also throws into stark relief some of the problems lying in wait for hypermedia ethnographers. Although we have argued (as have many) that hypermedia can allow for greater exposure for subjects’ ‘voices’, the characteristics of the medium are likely to create unexpected dilemmas, Wesch acknowledges.

The ‘burden of authorship’ is great in hypermedia ethnography, precisely because the subjects and their voices can seem so near (and therefore can be so easily misunderstood). My argument here has been simply that providing space for the subject’s own words does not equate to giving them voice. (2002b: not paginated)

Practical understanding of what the Web might do for ethnography has only just begun to be developed, and we hope that the work we report on here, as well as our current and future projects, will be able to take this potential forward.

Hyper-tensions

This is a good point at which to mention some particular dilemmas and tensions inherent to hypertext authorship. The first dilemma, as we have already noted above, is the tension between freedom and control. Hypertext potentially opens up the text through multiple linking, allowing the reader the opportunity to generate unpredictable reading paths. Given this, how does an author, especially one dealing with academic argumentation, simultaneously orient a reader towards intended readings as well as allow a reader to discover his or her own pathways through the hypertext? If data is to be included in the hypertext, how ‘cooked’ should it be and how easy to navigate? Second, how does an author ensure that the multiple choices are not so bewildering that a reader finds the hypertext impenetrable? Although being lost in hyperspace brings one set of challenges, being swamped in hyperspace can be just as disheartening (Barbules and Callister 2000). Keeping author control of the hypertext structure while allowing the reader the maximum amount of freedom poses severe problems. For fiction writers, this tension causes plot development difficulties. Earlier we considered the case of ‘Lucretia’, a character who dies at a certain point in a hypertext murder mystery. How can the hypertext be constructed so that, having read about her death, the reader does not then encounter a node in which she is still alive? In a complex hypertext (e.g. Joyce’s Afternoon contains 539 nodes and 951 links, Deena Larsen’s Samplers contains 238 nodes and 2,038 links), ensuring that Lucretia stays dead is a major task requiring extremely sophisticated linking. Whether we write as ethnographers with a scholarly interpretation to present or as fiction authors with a story to reveal we are faced with the same issue: how do we create narrative progression or logical argumentation in hypertexts? This brings us back to the issue of
sequentiality – for, in order to make sense, the enforcement of some sequentiality is necessary in any text.

As discussed earlier, most hypertext authors have addressed this by implementing a certain amount of control and constraint within a hypertext. At a more fundamental level, every hypertext we have come across so far has some form of imposed internal structure. This structure is usually implemented through navigation and metaphor. For example, in our own hypermedia ethnography we make use of both link variety and a metaphor to orient the reader. Our overarching metaphor is that of ethnographer as guide, treating the reader as a ‘visitor’ to the hypertext. The heart of the hypertext consists of two tours focused on specific issues. Each tour features a basic link from node-to-node so that a reader can follow the tour in a simple way. Text nodes can take the reader into less-structured excursions into ‘optional’ parts of the tour. Through the consistent use of a hypertext structure, enabling readers to understand where they are in relation to the whole, as well as consistent navigation strategies to aid in understanding where their choices will lead them, we hope to minimise reader disorientation. The use of such strategies allows the author to attempt to portray the rich complexity of social phenomena more fully than is possible in a printed linear text. Atkinson has noted the poetics of ethnographic writing and its role in conveying narrative and authenticating statements (1990); ethnographic hypertext writing offers new poetics for the ethnographer to explore (Dicks and Mason 1999). The promise of hypertext also lies in its ability to make scholarly texts more transparent, allowing the reader to identify and follow the construction of the interpretation. In social research this can be realised by making much, if not all, of the data accessible to the reader. When using the hypertext computer environment to help analyse the data, various links and structures are created by the developer that may not appear in the final, authored hypertext. It is a relatively simple, if ethically complicated, task to make these available to the reader so that s/he can trace the creation of ideas and interpretations developed by the ethnographer. In addition the reader can, in most hypertext reading programs, create their own links and add in their own notes and comments. In this way, a reader can explore the narratives constructed by the author, browse through the hypertext guided by their own interests or even move into the ‘backstage’ area of the data and create their own interpretations. Consequently we suggest that not only can hypertext aid the researcher’s interaction with the data, it also provides for a richer interaction between reader, researcher and data.

The tension at the heart of hypertext authoring can, we feel, be productive. As writers we found that wrestling with how to structure a hypertext that had no pre-given structure opened our eyes to the manner in which printed texts have normalised certain conventions of academic writing. Once we were outside of the security of the monograph we found ourselves at times, frankly, floundering; it was not until we were able to posit some initial structures that we gained any sort of understanding of what it was that we were trying to achieve. The advantage for us proved to be that, unlike a printed book, the hypermedia format allowed us to develop structures and navigation strategies that, we feel, were more appropriate to the subject at hand, and yet which did not mean we had to sacrifice academic rigour.
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Hypermemea futures

The ‘where do we go from here’ section appears to be mandatory in any work that deals with social science and new media/technology. Such sections seem, however, to function primarily to make the authors look foolish ten years down the road. It is said that ‘internet years’ are rather like ‘dog years’ (i.e. there are seven internet years for every one calendar year). The acceleration of virtual society has been noted by theorists (Virilio 1995) and incorporated into science fiction novels (Banks 1995). Predicting the technology of the future is a mug’s game, and discussing the technology of the present will make this book a good ten internet years out-of-date at least by the time you read it. We believe, however, that it is worthwhile pointing out some of the possibilities that we see in hypermedia and ethnography.

The Web is likely to become increasingly important as a medium for scholarly publication. Although to date it has not been very creatively exploited there are significant, if not highly visible, changes being implemented that may well function to make the Web a more viable medium for hypermedia ethnography and social science research more generally. The major change is the implementation of XML – ‘Extensible Mark-Up Language’. XML is designed to mark-up data (whether spreadsheet, database, address book and so on) in the same way that HTML marks up text, in order to allow it to be read on the internet and manipulated by any other program. This offers the potential for the design of online ethnographies that would not require proprietary programs to read the data. Also, because XML treats data as plain text and defines all the information needed to understand the data in situ, then the results should be future-proof. Digital archives have long experimented with the older SGML as a tool for the creation of generically readable data (e.g. Robinson 1993), and XML promises finally to make this possible. XML also underpins the development of the World Wide Web into what Berners-Lee terms a ‘semantic Web’ (2000: 169–90). At its most basic, a semantic Web is a hypertext with named links. By connecting nodes (Web pages) together via links with names, a relationship is defined between those nodes. This enables a much more complicated interrogation of information on the Web. The ability to create relationships between nodes is the key step in hypertextual data analysis; a subject to which we will return later in this volume.

Hypertext and hypermedia activity in the UK currently reflects a particular discipline-bound division of labour. In contrast to the widespread belief that hypertext is an inherently liberating form of postmodern authoring, due to its seemingly unstructured nature (Kaplan 1997; Landow 1997; Moulthrop 1993), many of its current applications outside the academy suggest quite the opposite. Hypermedia can equally be used for surveillance purposes, for assessment purposes, and for other aims that are at odds with this image of creative, non-linear thinking (McHoul and Roe 1996). We suspect that this split is likely to continue. Perhaps the biggest obstacle to academic hypermedia authoring is likely to be academic institutions. Academic credit is still based on publishing conventionally-authored monographs with major publishers or
articles in peer-reviewed journals. Hypermedia is a move away from the formal structures of the academic article or book with chapters. Further, it takes time to produce and needs the type of distribution medium that seems unlikely to win favour with university assessment procedures in the near future. Until such time, however, academics venturing into ethnographic hypermedia work may find that their work is not acknowledged as properly ‘scholarly’.

As a medium, hypertext/media will certainly offer challenges at all levels for qualitative research. Can we, or should we, blur the boundaries between analysis and representation and what, if anything, does this do to the research process? Will it prove possible to balance visual and textual components in a hypermedia or will one always be seen as a secondary? How do we deal with the tension between control and freedom? If, as Landow (1997) argues, hypertext makes for a useful tool to test poststructuralist theories of literature then it should also be able to ‘test’ ethnographic theory. Experimental ethnographic writing has worked to problematise the writing process; hypermedia may well problematise every aspect of the ethnographic and qualitative endeavour.
In this chapter, we consider the extent to which ethnography is exploiting the different kinds of media that are potentially available, within the context of hypermedia. The term hypermedia has two distinct dimensions: hyperlinking (involving connectivity, orientation and the ordering of meaning), and multimedia (the various material forms in which meaning is conveyed). This chapter focuses on the latter, addressing some of the complex issues raised by the bringing together of different media in ethnographic research. We begin by noting that the use of the term ‘multimedia’ in qualitative research is becoming more and more routine. Any research project using some combination of images, writing and sound can claim to be a ‘multimedia’ project. However, the term is often used in quite restricted, and sometimes confusing, ways. The word ‘media’, for instance, is often taken to refer both to the technical means by which something is represented – such as cameras, pens-and-paper, laptops and tape-recorders – as well as the material forms that those representations take – such as written fieldnotes, photographs, recorded sound and video images. As a result of this slippage, the term multimedia often refers primarily to the use of various technical recording aids, and the term ‘multimedia data’ simply to the materials produced by them. We intend to outline an approach to multimedia here that goes beyond this rather limited definition.

**Multimedia in qualitative research**

As we have outlined, there are two principal ways in which the use of multimedia is usually envisaged in qualitative research. In the first, it refers to the various media used by the researcher to *record* his or her observations of the field. In the second it refers...
to those media collected by the researcher in the field. The latter often involves studies of media forms, as in ethnographies of ‘indigenous’ artwork or film. In these two usages, media are approached in rather different ways. In the first approach, the multimedia aspect of the fieldwork may be envisaged solely in terms of what we might call the ‘recording metaphor’. Here, the term ‘data’ becomes coterminous with the technically-produced material products – such as written fieldnotes, images and sound-recordings – produced by ethnographers and then carried away from the field for subsequent analysis. Such an approach tends to equate data with recordings, and recordings with representations. An obvious danger of the recording metaphor is that the mediating effects of the technologies used may be neglected. They may be seen simply as a means to an end – albeit not a neutral or transparent one – but one in which the distinctive semiotic properties of different media tend to slip from view, so that they become mere carriers of something called ‘data’.

In the second approach, by contrast, naturally-occurring media forms – such as artworks, photographs, films and material artefacts produced by groups of people situated ‘in’ the field – are studied in their own right as expressions of the culture or way of life under investigation. If the tendency in the first usage is to underplay the semiotic specificities of different media, in the second, there is likely to be much greater attention paid to their culturally-specific meanings. For instance, the ways in which a group uses technology to depict its own culture may be read as evidence of its distinctive ‘way of seeing’. (A classic example of this is Edmund Carpenter’s (1995) camera work with New Guinea people who had never before seen or used a camera.) These two different approaches define media, rather contradictorily, as either relatively neutral (in the recording metaphor) or decidedly culturally-specific (in the expressive metaphor). What both approaches have in common is a tendency to define multimedia data as that which is produced by the conscious and deliberate use of various media technologies – from paintbrush to video camera. However, we would wish to argue that the term ‘media’ is at once broader and more tightly defined than these technological usages suggest. It is possible to make two distinctions. First, we can distinguish between different stages of the ethnographic research process and the different ways in which multimedia may be employed at each stage, rather than simply as ‘data’. Second, it is useful to distinguish between the terms ‘media’ and ‘mode’ (cf. Kress and Van Leeuwen 2001). Hence we can distinguish between the inherently multi-modal nature of the social world itself (a particular aspect of which researchers identify as the ‘field’ or the research setting) and the various media within it that we can directly observe in material form. These material media forms are what we can think of as data – data being the represented world as we know and experience it, rather than the ‘world in itself’ (Bauer et al. 2000). If we restrict our use of the word ‘data’ to observable elements of the field setting, rather than to our recordings of it, we suggest that the multiplicity of media forms in any setting can be more clearly appreciated. The question of which technical media, if any, we may select for recording our observations then becomes a separate issue. We may choose to use pen and paper, or we may

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embark on a fully-equipped filming project. What we thereby produce is something which is often also, confusingly, called ‘data’, but which we need to distinguish from data in the field.

However, distinguishing between data in the field and our recordings of them brings a potential danger. If we think of written notes or video film as data-recordings, we are already employing a metaphor that suggests a neutral process of data capture. Against this, we need to be aware that data-recordings, in standing for the field in its absence, can never reproduce its inherent multimediality and multimodality. The various recordings with which analysis works present media which are typically much reduced in number and variety than those occurring in the field – usually, they are confined to either written or audio/visual forms. Therefore, there is an inevitable process of transformation in which the living, material and textured social world is represented in its absence by ‘dead’ records produced within a much-reduced range of media. Related problems and questions ensue. For example is the photograph simply a two-dimensional representation of three-dimensional data? Why do we need a camera to record it rather than our eyes and brain? Does the camera function rather like the audio-recorder for interviews, making us, as Emmison and Smith (2000) suggest, reliant on thin, extracted representations of complex situations? Such questions foreground the inevitable gaps between the world we observe ‘in situ’ and our representations of it. That these so-called ‘recording’ media transform the world they represent is not a novel insight. Over the last thirty years or so, semiotic approaches and the ‘linguistic turn’ in the humanities and social sciences have drawn researchers’ attention to the complex processes involved in representation. Among other things this has underlined the constructed and rhetorical nature of the representational practices ethnographers use (Clifford and Marcus 1986; and see Chapter 2 this volume). Yet it often proves difficult to sustain this understanding when analysing representations of one’s own data produced through technical media. Audio-recordings of speech, for example, appear simply to copy it, yet they lose many of the modes accompanying speech – such as facial expression, gesture and gaze – that contribute to its meaning-making power. A thorough-going appreciation of multimodality, we contend, involves paying attention to the complex interactions of multiple modes within the field.

When we work with multimedia recordings as a representation of a complex field, we also need to pay attention to how these different media interact together. Not only do they transform what they represent in the field, further levels of meaning are produced through their interaction and fusion (not least through subsequently being orchestrated together on the electronic ‘page’ or computer screen). This multiplication effect means that the term multimedia can actually involve the bringing together (not merely the adding together) of different mediating agents. Accordingly, we can propose that, in the current context of digital convergence of various electronic digital media, the semiotic, linguistic and poststructural turns are posing a new set of difficult questions. The potential for combining different media together vastly complicates the web of meaning that ethnography can produce. One of the challenges now
facing ethnographers is to try and understand what kinds of meaning can be produced in the process.

**Sound and vision**

To date, multimedia work in qualitative research has been dominated by visual media. Indeed there has been a recent explosion of interest in visual methods in a range of disciplines (see Banks 2001; Emmison and Smith 2000; Pink 2001; Rose 2001; Van Leeuwen and Jewitt 2000). This no doubt reflects the current predominance of visual modes of communication in society as a whole (Kress 1998). The visual realm is central to qualitative research in the digital age, since it can now more obviously assume a role no longer confined to illustration (merely reinforcing meanings secured through words), but one central to the communicative power of the whole project. This new potentiality requires careful thinking through, however, particularly given the history of scepticism towards visual methods still found quite widely within the social sciences.

So far, there has been much less attention paid to the potentialities of sound – another mode that new digital recording and processing capabilities allow the ethnographer to exploit (see Bauer 2000). Sound has classically been seen as the accompaniment to images, as in audiovisual recordings. Or, as in the case of audio-recorded interviews, sound has been quickly transcribed into written text. Compared with the written word, recorded sound has been difficult to manipulate. Now that high-quality sound can be easily and unobtrusively recorded, and (through hyperlinking) connected to other media in novel ways, its role and value as a distinctive form of data in qualitative research needs to be reconsidered. Similarly, hypermedia allows other media more fully to enter the ethnographer's toolkit – such as graphical images. Much of the literature on visual methods tends to privilege camera-generated images (though Emmison and Smith 2000 is a commendable exception). Yet multimedia can include graphical documents and images that are not produced by cameras. Screen-based platforms allow these different media to be integrated together in the same channel, thus overcoming the traditional storage and access problems of each particular medium (Seaman and Williams 1992).

However, one of the dangers of multimedia ethnography is that different media are used simply because the technology exists to allow it. There is a temptation to wield a video camera as well as a minidisk recorder solely because the equipment has suddenly become affordable. Bearing in mind our remarks above about the inevitable transformations involved in the use of recording media, it should be stressed that the implications of choosing different media are considerable. They should, therefore, be carefully assessed. For example, if one's research data are largely based on spoken interviews, the use of a video camera (as opposed, perhaps, to a stills camera) may be redundant. It is a matter of using the appropriate media for recording different kinds of data. This relates to our argument about the *affordances* of different media: the characteristic kinds of representation that each brings (see Kress and Van Leeuwen 2001). We shall return to this question below.
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**Modes and media**

In thinking through the question of multiply-mediated meaning, we have found useful the distinction discussed by Kress and Van Leeuwen (2001) between modes and media. As we indicated above, *modes* are the abstract, non-material resources of meaning-making (obvious ones include writing, speech and images; less obvious ones include narrative, gesture, facial expression, texture, size and shape, even colour). Modes cannot be directly observed, for they are abstract resources; they are rule-governed, codified sets of meaning-resources, involving the idea of formal ‘grammars’ (for example, the grammar of film and that of writing). However, modes are not always governed by grammatical rules of combination. Language is organised grammatically, but visual images are more lexically ordered (i.e. a loose collection of icons that can be arranged in an indefinite number of ways – Kress and Van Leeuwen 2001). What we actually observe in the field are the various *media* in which these modes are produced – marks on the page, movements of the body, sounds of voices, pictures on the wall. Media are the material resources that make meaning (including both tools and the materials used). For example, speech can be thought of as a mode (an abstract rule-based system) of communication that can be contrasted to that of writing; however, the spoken word can be thought of as a medium, too, i.e. in its ‘material’ form as the sound-waves emitted by the human vocal apparatus.

As Kress and Van Leeuwen observe, ‘multimodality and multimediality are not quite the same thing’ (2001: 67). The same mode can be realised by different media. For example, we can imagine an informant choosing to tell the story of their lives either through photograph albums or the spoken word. In both cases, they are using the ‘mode’ of narrative to make sense of their lives (through making separate use of image and speech). So the abstract rule-governed resource of narrative may take material form in both photographic images and spoken stories. When these pictures and words are combined together, the mode of narrative is transformed into a multimedia form that has different meaning-potential than either of the single forms. Similarly, meaning is produced through combinations of objects, artefacts and materials. Material semiotics, for example, deals with the ways in which objects themselves communicate meanings (i.e. through mobilising particular modes such as shape, size, texture and colour). Accordingly, we might want to consider how the field-setting space is organised via the entire ensemble of material objects and structures within it. This would include their positions, colours, shapes, and so forth. In that case, we would also need to consider the extent to which the material organisation of various media in the field-setting contributes to the production of ethnographic meaning. How, for example, does the layout of a classroom’s furniture, the colours of its walls and the shapes of the desks and toys within it work to anchor particular meanings of childhood and pedagogy? Here, we need to bear in mind that, while modes are inevitably realised through media of various kinds, media are not necessarily organised into modes (Kress and Van Leeuwen 2001).
Some media do not operate according to organised and well-established distinctions of meaning; in other words, they do not have modes. Certain semiotic resources may be recognised as modes in some domains, particularly specialised ones, but not in other, more general ones. Gesture, for example, is a recognised mode in the psychology of body language but not in classroom teaching (though there is no reason why it shouldn’t become so). The teacher designing a lesson plan is unlikely to include gesture (not recognising it as a mode), but is likely to include visual images and writing. The medium of paper, similarly, does not have a corresponding mode in most classroom settings. But those who specialise in paper-based media have formulated a semiotics of paper qualities (e.g. glossiness, opaqueness, etc. and their various signifieds). And smells, again not a mode in ordinary discourse, have a recognised grammar which specifies how to categorise them in specialist discourses such as aromatherapy and perfumery (e.g. each one has a head, body and tail).

In changing cultural and historical conditions, then, media can become turned into modes. The more ‘work’ a particular culture invests in a medium, the more it takes on the qualities of a mode (e.g. paper or computer icons becoming modal). As more and more of the manufactured material world becomes subjected to the practices of design, more media are co-opted into the processes of making meaning (Kress and Van Leeuwen give the example of the sound a car-door makes when it closes: sound-designers having been employed to simulate the requisite satisfying click). Hence new technology changes more and more media into modes. This means that ethnography confronts an ever-expanding and increasingly codified universe of meaning within its field settings. Moreover, modes are not necessarily discrete. As Kress and Van Leeuwen argue:

We seem to be at an odd moment in history, when frames are dissolving everywhere, and formerly clear boundaries are becoming ever more blurred. It is not therefore surprising that the same may be happening with representational resources. We may be approaching a time when the question is not so much ‘what discrete modes are occurring together?’ as ‘what ensembles of resources are being produced?’ (2001: 25)

A good example of this is writing. This is not so much one mode as a composite mode, for it brings together the visual dimension and the phonetic. In the late middle ages, early print writing was frequently deployed in combination with elaborate pictures and images; it was only from the late eighteenth century that the modern book conventions of uni-directional, fixed, homogeneous blocks of print surrounded by white space became established (Bolter 1990). Images became relegated to occasional illustrations, and were often banished entirely from ‘serious’ works. Today’s computer screen is not amenable to these long blocks of unbroken print. Accordingly, writing is again being redefined, as the screen allows its various modal components to be separately exploited. For example, it is now possible to make meaning from the directionality of writing, by breaking text up, moving it around, stacking it, and so forth. The fact that the entire screen is bit-mapped, divided into ever-finer pixels, means that
it becomes a fluid, graphical space. Writing’s visual modes therefore come more fully to the fore.

In summary, the distinction between modes and media is a useful one, we contend, for ethnographers. It draws attention to the different resources or grammars that allow people and environments to communicate and to produce meaning. Rather than focusing solely on observable media, it encourages appreciation of the different (or indeed similar) kinds of meaning that different media afford. This focus on the various affordances of different media allows the ethnographer to appreciate how meaning is made across a variety of media acting in multiple combinations with each other (Kress and Van Leeuwen 2001). This is why, as Kress (1998) argues, multimedia does not simply mean adding the visual and the lettered modes together, but the production of a distinctive, multi-semiotic code of representation. It follows that in order to understand the ‘meanings’ of any environment, we need to understand how its various semiotic modes and media work together to produce a particular set of meaning-effects.

Media at different stages of the research process

Different media can be employed at different phases of the research process, from defining the research setting to producing the finished ethnography. There are a number of elements to consider here.

Multimedia observation in the field

Before wielding any kind of technological recording medium, the ethnographer needs to consider the sheer range of media that abound in the field-setting – all the observable forms that communicate some kind of meaning. These might include bodies, material objects and landscapes as well as sounds, pictures and written texts. Together, they orchestrate the field’s complex and particular ensemble of meanings. Understanding the meanings of these media implies also understanding what semiotic modes they are deploying. Accordingly, a first step in multimedia ethnography is to look at the field in terms of the various modes and media at work within it. This step involves a recognition that there are all kinds of communicative modes being realised in even the simplest field-setting, and that understanding the ‘meaning’ of that setting, and of the actors who move within it, involves trying to attune oneself to this variety. Attending to the field’s inherent multimodality in this way makes it clearer what kinds of information are lost (and which gained) with the use of technical recording devices such as video cameras or tape-recorders.

Multimedia data-recording and analysis

A second use of multimedia is apparent as soon as the ethnographer begins to record his or her observations. As already noted, we need to be aware of the various transformations
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effected by the use of different media for recording. It is easy, for instance, to lose sight of the physical materiality of the research setting, and its contribution to the field’s meaningfulness, when data are collected in the form of images, fieldnotes and/or recorded sound and then ‘taken away’ for analysis. What happens with recordings onto videotape, for example, is that the three-dimensional modes of shape, texture, size, physical position, and so forth, are translated into two-dimensional images. This has implications for how subsequent analysis and interpretation is likely to be approached (since the multiple material dimensions of the field may slip from view).

For example, in our own hypermedia project, we recorded many hours of video footage of ‘naturally occurring’ action in the Rhondda heritage museum, as well as video-taped interviews with guides and visitors. We also audio-recorded a number of face-to-face individual and group interviews and transcribed these into written form. When it came to analysis, we found ourselves working, in practice, with just four principal media, i.e. written texts of various kinds, still images, moving images and sound. What we found was that, although aware of the dangers of the recording fallacy, it was always a struggle to keep the mediating effects of the media we used in view. In other words, during analysis we tended all too easily to treat our video footage as records rather than as constructs. Accordingly, we frequently found ourselves analysing the video footage as if it were what happened in the field.

To keep both levels (the documentary and the representational) simultaneously in mind is a difficult endeavour. For one thing, by the time the analysis phase ‘proper’ occurs, it is often the case that the researchers have left the field. This underlines, perhaps, the value of undertaking serious, ongoing analysis during the fieldwork stage itself. This may, however, be impractical owing to time constraints (and even, according to some arguments about the benefits of ‘distance’ for critical reflection, undesirable). It also, however, underlines the ease with which field data are ‘left behind’, becoming redefined as the material records that the researcher takes away. It was partly this experience which, with hindsight, made us appreciate the importance of attending to the multimodality and multimediality of the field itself, and becoming more conscious of the transformations and, inevitably, the reductions involved in using technical media for data ‘collection’.

Multimedia in research representation

Similar problems beset the process of representation, authoring or ‘writing up’. Many multimedia projects collect data in different media but then resort to a single medium for the representation of the research end-product. Typically, these end-products are either written texts or films. Written ethnographies struggle to represent fully the media and modes ‘left behind’ when the researcher leaves the field. For instance, writing is not a very economical or effective medium for describing the detail of spatial relations; images, by contrast, excel at this. Perhaps this is why written ethnographies and research reports have sometimes paid scant attention to the meaningfulness of material environments. Similarly, an ethnographic film cannot, arguably, represent the
level of academic argumentation necessary to do justice to the more theoretical implications of analysis. This is why continuing the multimedia strategy into the representational phase of the research potentially strengthens its explanatory power. In our work, we are exploring how to ‘write up’ our analysis in multimedia form.

Multimedia authoring returns to the complex question of mode and media combination. When data extracts in different media (say, photographs and fieldnotes) are combined into one ethnographic account, they do not retain their own separate meanings, but take on new meanings by virtue of being brought together. In other words, meaning is produced through a process of re-combination or fusion. For example, it is obvious that still images communicate differently when linked to a written caption or a musical soundtrack as opposed to when they are left to stand alone. And video sequences, likewise, are transformed by being juxtaposed to spoken or written text. Multimedia ethnographic authoring in the digital age needs to attend to the implications of such fusions. In practice, ethnographic authoring potentially works with three principle media. First, there is the written word, with its various modal resources. Second, there are digital visual media (still and moving photographic images; still and animated graphic images). Third, there are digital aural media (audio soundtracks, either stand-alone or linked to images). There are various possibilities presented by these media which hypermedia ethnographers can embrace, including:

1. Archives of still photographic images hyperlinked to written interpretative texts;
2. Raw, unedited video footage of selected field events or situations, hyperlinked to an overlaid soundtrack of the ethnographer’s or others’ voices;
3. Sequences of edited video designed to make filmic sense on their own terms, linked into the rest of the ethnographic hypermedia environment (EHE) in various ways;
4. Digitally (re)produced or enhanced graphical representations, such as sketches showing scenes that the camera cannot capture (e.g. a long-demolished colliery or an obsolete ritual) or drawings and maps made by fieldwork participants;
5. Unedited or edited audio sound, perhaps of informants’ recorded voices or more general field-setting soundscapes, again hyperlinked into other texts and/or images in the EHE.

These are only a few of the potential uses, and one can imagine many others which would allow the hypermedia ethnographer to co-ordinate different media in innovative ways. Each of these possibilities, of course, brings its own problems and potentialities, and involves the ethnographer in quite complex decisions. In effect, digital-age ethnographers are required to become designers in ways that their writing-based or film-based predecessors were not (see Kress and Van Leeuwen 2001, on the ubiquity of design in the age of digital communication). That is not to say that single-medium ethnographies will disappear, for they will always retain their own particular communicative powers. But today’s digital platform makes the question of choice unavoidable. The ethnographer is potentially confronted with (a) the task of selecting among
a suite of recording and representational options, and (b) the task of orchestrating together the selected media into a field of meaning which makes the ethnographic sense that is required. This is no small endeavour.

**Multimedia meanings in qualitative research**

There are a number of ways in which multimedia can potentially help to enrich, as well as trouble, the production of meaning in qualitative research. With this in mind we now move on to discuss five particular issues: semiotic affordances; the constraints of screen-design conventions; the question of contingency; the debates about ethnographic authority; and, finally, the small matter of the hyperlink itself.

**Affordances**

The ability to represent, within one channel, a range of different media draws attention to the varied semiotic qualities of different media forms: what Kress and Van Leeuwen (2001) call their ‘affordances’. Kress (1998) points out that hypermedia and, indeed, any screen-mediated form of multimodal representation, brings out the different material properties of language. For example, sound and writing are shown to be inherently different from each other – one is temporally determined and has no visual component; the other is spatially determined and is embodied graphically. The spoken word is truly linear and sequential – it unfolds over time and leaves no trace as it is uttered, while writing is a simultaneous, permanent graphical representation that can be repeatedly perused and skimmed in different sequences. For this reason, it is not strictly true to say that writing is linear, for its reception – i.e. reading – is very often non-linear (see Chapter 7, this volume). The spoken word, however, is nearly always linear. For such reasons, the spoken word is suited to the description of events ordered into sequences, and is thus oriented towards unfolding narrative functions like story-telling. As each word ‘disappears’ after its utterance, it is easy to generate the effects of suspense and the stringing–out of enigmas. The written word, on the other hand, like other visual forms, lends itself to the depiction of an arrangement of elements and their relationships to each other. It can still generate suspense, but is also ideally suited to structured argumentation. The permanent, sequential arrangement of ordered clauses on the page makes it possible to peruse, at leisure, hierarchically ordered, logical connections between one element and the next (Bolter 1990).

Hence, multimedia representation implies careful consideration of how different media afford different kinds of meaning. Voices, for example, vary considerably in tone and quality – giving us immediate clues as to the speaker’s gender, age, social status, mood, and so forth. Intonation and rhythm, too, convey important dimensions of meaning. Accordingly, when an informant’s voice is ‘heard’ (as opposed to being ‘read’ as a transcript-extract), there is an important sense in which it stands for itself – as opposed to being incorporated, in its transcribed form, by the modes of writing.
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Writing, potentially, may then begin to lose its long-established monopoly and start to be used for more mode-specific functions – for explaining sounds and images, for example, or for pointing to them. These possibilities have important implications for academic authoring (explored further in Chapter 8, this volume).

Contingency

Multimedia brings a marked potential for opening up the field of meaning, and highlighting the complexity and contingency of interpretation itself. As with initiatives associated with post-paradigm ethnography (see Chapter 2, this volume), bringing together image, writing and sound enables the representation of multiple voices and perspectives. This multi-perspectival potential can be developed in quite economical ways through multimedia. For example, sounds can be used creatively to contradict or suggest alternative readings of images. Images can be counterposed to each other to show different perspectives on the ‘same’ situation. Writing can be used to question the meaning of images and to show up their malleability. In such ways, hyperlinked multimedia (or hypermedia) can be used to produce deliberately ‘open’ meanings in qualitative research. This contrasts with conventional wisdom that sees images and words as working together to tie meaning down (where, for instance, a written caption or title ties down, or anchors, the meaning of a photograph – see Chaplin 1994).

A film can, of course, be made deliberately ambiguous using speech, soundscapes and images alone, just as writing can produce ambiguity using solely the poetics and rhetorics of written language. But bringing the semiotic potential of writing and sound images together creates an even more complex and potentially open representation. Because hypermedia brings together the capacity for interlinking lengthy written texts as well as sound and still/moving images, there is considerable scope for creating a sense of the contingency and complexity of ethnographic interpretation. This sense of contingency is pointed to by Marcus (1994: 37), in his discussion of ‘the cinematic imagination at work’ in contemporary ethnographic writing. By this, he means that there is a cultural fit between experimental film and experimental writing responding to ethnography’s crisis of representation. Film offers key representational characteristics that allow the rupturing of the foundational tropes of realist ethnography. These include the disruption of, among other things, temporal chronology, settled community, concepts of social structure and the assumption of otherness. Marcus points out that through devices such as montage, films have long been able to represent multiple and competing perspectives, reflexivity, the experience of simultaneity, and the juxtaposition of different timescapes, via flashbacks, flash-forwards and so forth. For example, experimental film has been adept at conveying a sense of ‘parallel worlds’, and disrupting assumptions of a unitary cultural world-view. These effects are difficult to achieve in writing, due to its inherently sequential, consecutive and singular nature. It follows, therefore, that multimedia has the potential to strengthen the representational repertoire of ethnographers in their search for alternatives to the realist conventions established in the previously dominant written mode.
Whilst Marcus (1994) is correct, it seems to us, in suggesting that film offers possibilities for exploring more contingent and fluid conceptions of meaning, it should be borne in mind that film itself is no more inherently open than writing. Film can also tie meaning down rather than open it up. The potential that hypermedia offers for a more sophisticated representational practice comes rather from the possibilities of combining different representational forms within the same multimedia environment. It is through a careful and principled montage of different media that the potential for new meanings can emerge.

**Screens**

Computer screens orchestrate meaning in particular ways. The screen-based delivery of electronic multimedia ethnography will have implications for the kinds of meaning that are produced. There is already a process of modal transformation occurring, for example, in the world of instructional media, and screen-based ethnographies will not be immune from its influences. As Kress (1998) argues, the role of writing in school textbooks has been slowly redefined over the past 20 or so years. In science textbooks, where written text used to carry the bulk of information, now images have a greatly enhanced role. Newspapers, too, have followed suit, mimicking, to varying degrees, the design-language of Web sites. For instance, Kress suggests that writing is increasingly used, following Web-conventions, for the purpose of simply pointing to images ('look at this!'; 'click here!). Pages in informational publications of all kinds are thus increasingly visual in their layout, eschewing the older convention of unbroken blocks of print. This relates to McLuhan’s (1964) observation that, through a process of hybridisation, media forms come to incorporate each other’s features. In this way, the computer screen encourages and establishes a new combined mode of image/writing (see also Bolter 1990).

Since hypermedia does not give us writing or sound or images, but a combination of all three, ‘pages’, in the process, mutate into something new. The combinatory effect of multimodal representation is not a novel feature of hypermedia. As Lemke (2002a) points out, it is also a feature of ordinary embodied communication. The spoken word communicates through non-linguistic signs such as tone and intonation as well as through words. Writing, further, is not only read through linguistic units of meaning, but also through graphical cues (such as typeface, bullet points and paragraph indents). Accordingly, hypermedia’s multimodal nature is not a radical departure for human communication. It does, however, bring its implications much more clearly to the fore.

Sound, for example, is becoming more widely utilised onscreen – in games, certainly, but also in Web sites and instructional hypertext. The task of multimodal screen-based representation accordingly becomes one of ‘complex orchestration’ (Kress 1998: 77). The combinatory effects of bringing multiple modes together into one ‘space’ – the screen – have to be borne in mind. Pages become more oriented towards display rather than narrative, and the task of text-makers becomes focused on design. Written text may be ‘demoted’ to a smaller proportion of screen space. With the multiple
window as its defining topographical feature, the computer screen mimics not the modern printed book with its clean simple space, but the magazine – where the page is divided into blocks composed of different media and different typefaces (Bolter 1990). Hence the magazine-like layout of many professional Web pages.

Further, the use of underlined links in hypertext suggests that writing's meaning is always elsewhere, always deferred until the next link is followed. The activity of hypermedia readers becomes directed towards what Lemke (2002a) calls traversals – the multiple trajectories that they find and trace, and which cannot be mapped out in advance by the author. In fact, in hypermedia, each screen-page consists of a combination of information on offer and invitations or demands for action on the part of the user (inviting him or her to use the mouse to explore the options identified).

There are a number of ways in which screen-based representation may actually work to limit, rather than expand, the field of meaning. The screen pulls these different modes into a spatial contiguity. Sound arrives through clicking on a particular portion of the screen. Sound becomes, in other words, tied into space. Videos and stills, too, have to occupy a certain position within the screen's available space. The screen thus subjects these other modes to a higher-order spatial framework – placing this here and that there, allotting this to one screen and assigning that to another. The screen acts, in this way, as a powerful spatialising mode.

The screen's prioritisation of space means that hypermedia becomes limited in its representation of time. A film can easily achieve complex temporal effects, but these are decided in advance. They are not controllable by the spectator. By contrast, hypermedia is predicated on the giving of choice to users – the choice of where to go and which path to follow. Yet on a computer screen, the existence of these paths is inevitably realised through visual and spatial signifiers. A still image on a computer screen exists in a spatial dimension but has no temporal dimension. On the other hand a sound clip played by a computer has no spatial presence but exists purely along a temporal axis. A video clip exists along both dimensions (see the discussion in Chapter 5). To create a link from or to an image requires the ability to select a spatial area; to create a link to/from a sound clip requires setting up a temporal link. The spatial link, by its very nature, simply sits there, waiting to be activated when the user so chooses. But setting up temporal links that can be activated at will poses considerable problems. In the absence of visual cues, how would one know when different links became available? Because time-based sound 'disappears' as it unfolds, there is no enduring trace of the 'whole' left behind from which to select a link. By contrast, the space-based media of image and writing present a visual map – as Hastrup (1992a) points out – of a whole environment. Images are always present on a screen, but sound is inevitably located elsewhere – unless tied into images as in video, or given some graphical representation (e.g. by waveforms). By tying representation into its predominantly visual spatial co-ordinates, the screen implicitly promotes that which can be seen over that which cannot. Links become equated with spatial positioning.

All of these screen-design constraints are likely to impinge to a degree on the business of ethnographic representation, transforming and reworking it in the process. And they
arguably bring a number of dangers with them – such as those of over-simplification and fragmentation. For example, sound may be expected to come in the form of sound-bites – snippets rather than more lengthy exchanges. Moving images become fragmented into clips. Ironically, the bitty layout of multimedia screens may actually give the impression of excessive (and unwarranted) clarity, rather than the openness and ambiguity discussed earlier. Inevitably, some of the peculiar conventions and crafts of medium-specific representational practices (e.g. the complex rhetorics of writing) will be reconfigured, even lost, when different media are brought together into a single screen interface. We explore some of these issues more fully in Chapters 7 and 8.

**Authority**

These potential transformations in representational practice have implications, inevitably, for the issue of ethnographic authority, or ‘ethnographicness’ (Nichols 1994). How to maintain, or perhaps reinvent, appropriate intellectual standards and rigour in the digital, qualitative, multimedia environment? What, indeed, is rigour in ethnography and qualitative research, and how can it be identified? While we consider such questions in relation to the conventions of academic authoring in Chapter 8, here we want to introduce some issues of ethnographic authority. In bringing together images, writing and sound, multimedia ethnography is combining modes that have historically assumed quite different kinds of cultural authoritativeness. The voice, for instance, has usually been assumed to be inevitably more subjective than the written word. The image, meanwhile, has been seen as less trustworthy than both of these.

Let’s return to the question of sound. Sound, of course, has not really entered into the sights (so to speak) of print ethnography. But it has been central to the establishment of authority in ethnographic film. Hence, the device of narrative voice-over has classically been used in ‘expository’ documentary film to provide the effect of objective overview, knitting image-sequences together that simply illustrate the authoritative interpretation. Although still used, this device is increasingly supplanted by the now-favoured convention of allowing the voices of informants themselves to tell their own stories (Hockings 1994). In this case, the impression of authority can still be achieved (note that we are not talking here of the more avant-garde film styles, discussed in Chapter 2, which consciously foreground the impossibility of authoritativeness). However, instead of via one voice, authority can be established through the careful editing together of different, even conflicting, voices so that the end effect is of a coherent, though complex and nuanced, mosaic. This is the effect achieved, for example, in many social-realist films, such as those produced by the long-established Amber film co-operative based in Newcastle, in the UK. In their well-known film of 1985, for example, *Sea Coal*, the individual voices of the coal-gatherers confer both the authenticating effects of subjectivity (‘this is my story’) and, through their interweaving into an edited sequence, the documentary authority of objectivity (‘this is their story’). Such different kinds of authority (or, more properly, authority-effects) are also available for exploitation by ethnographers in their use of voiced sound via the multimedia screen. This means that the authority-implications
of the spoken voice will need to be quite carefully considered in multimodal ethnography. Should the ethnographer speak ‘on screen’? Or should we reserve the spoken word for our informants, and the written word for the ethnographer? And, since every speech-act implies an addressee, should we be thinking more consciously about the mode(s) of address that we are utilising? Kress and Van Leeuwen suggest that ‘images create similarity and sound difference’ (2001: 105). In the light of this, what are the different kinds of authority that each brings?

A further issue concerns the questions posed by the camera/fieldnote divide. Here, we are talking about two different kinds of ethnographic authority: that produced when ethnographers rely on the powers of their own senses (particularly sight and hearing in the making of fieldnotes), and that produced when these are aided by the camera (both through photographic stills and moving video or film). The camera is a technology that – supposedly – enhances human powers of memory and observation. The ethnographer’s pen or typewriter, of course, are also technological enhancements of human powers – but involve the observer and the observed in quite different relations to each other. For instance, the film-based ethnographer sees the field through the camera lens, while the writing-based ethnographer observes first, and then writes. The camera lens works to ‘enframe’ the field into compositions, while the constantly moving human eye tends to organise it into scenes. These two traditions have produced quite different understandings of authority within the field of ethnography.

An influential tradition of the mid-twentieth century, encapsulated in the work of anthropologists Margaret Mead and Geoffrey Bateson, privileges the observational power of the camera lens over that of the unaided fieldworker. In their fieldwork, they amassed vast archives of photographic stills as permanent, objective records of the field (e.g. Bateson and Mead 1942; also see Mead 1995). As Chaplin (1994) points out, by being grouped together in carefully planned sequences, the photographs of Balinese life made by Mead and Bateson were able to speak for themselves without being weighed down by the verbal strait-jacket of established Western social scientific terminology. Mead and other ethnographers (such as Becker 1986; Collier and Collier 1986) were in turn countering an earlier position which had argued that photographic images lacked objectivity and rigour compared to fieldnotes (Pink 2001). Whereas anthropologists such as Mead were able to argue successfully for photographs as sound evidence of ‘the field’, the positivist tradition of sociology, up until the 1960s, largely shunned their use (Chaplin 1994).

Problems attributed to the use of photography in social science have focused, in the first instance, on the aesthetic quality of images, which is held to detract from their scientific significance. Second, images have been seen as inherently ambiguous, making them unsuitable for communicating in the precise and accurate way demanded by scholarly reasoning (Lemke 2002a). Third, there is concern about the tendency for a single picture to suggest something about the typicality, currency, distribution and so forth of its depicted subject-matter (see Goffman 1979). In reality, the picture may be the outcome of a very selective defining process, which itself determines its meaning. We can take each of these objections in turn.
In terms, first, of the problem of aesthetics, it has been argued by some visual anthropologists that artistry and poetic effects are at odds with scientific value. For example, Heider argued that ‘The Nuer is one of the most visually beautiful films ever made … But the film is almost without ethnographic integrity. By this I mean that its principles are cinema aesthetic’ (1976: 35). What is being argued here is that the film’s poetic, associative editing techniques produce audience responses which are largely emotional, and which mitigate against any informative, documentary value. However, it should be recognised that it is virtually impossible to separate out the aesthetic qualities of an image or an artefact from its documentary, evidential ones. Indeed, as Bal (1996) has argued in relation to ethnographic versus artistic artefacts, the difference really lies in the way each is read – which is in part produced through the effects of staging and context. When a necklace is placed in an anthropological museum, it assumes the status of a document evidencing a place, an era or a way of life. Placed in a museum of science and technology, it evidences a set of technological skills. In an art museum, it ceases to be a document and becomes instead a metaphor for artistic creativity. Accordingly, the same object can be read both aesthetically and scientifically in different contexts. The aesthetic dimensions of photographed images can be consciously emphasised or downplayed, but such images cannot be said to be intrinsically aesthetic or scientific. Convention is important – the depiction of a routinely aestheticised image, such as a necklace or a sunset, is bound to activate predominantly aesthetic judgements.

Perhaps, as Pink (2001) argues, we should not necessarily be too anxious about the aesthetic reading of images. The aesthetic qualities of, say, landscapes, objects, people and buildings are part of the reality of the field and its many layers of meaning. They are part of what the ethnographer is trying to uncover and understand, and the camera can be a useful means of identifying them. It is true that, once turned into an image and ‘enframed’, subjects can be over-aestheticised by being isolated from their everyday context and presented as an object of the gaze. However, this danger is perhaps more likely in written ethnographies, where print allows only a small sample of images to be included. In hypermedia, multiple images can be depicted on screen, together with writing and sounds, in a way that allows, potentially, a more exhaustive depiction of their varied social contexts and significance.

In terms of the second problem with images, that of their imputed ambiguity, there is a sense in which ambiguity itself is becoming more valuable to ethnographers, as they struggle to represent the multiple perspectives of complicated social realities (see Chapter 2). Ambiguity suggests a lack of clarity, but it can also be thought of as a means of showing up complexity. Lemke (2002a) argues that ambiguity is, in fact, no more characteristic of images than of words. If, for example, we consider a photograph of a children’s classroom, the details of that scene are arguably conveyed less ambiguously than they would be through verbal explanation. Of course, there is much that such a photograph would fail to convey (i.e. those social elements that are not visual – a question to which we return below). Nevertheless, at risk of stating the obvious, that which is visual is depicted most efficiently through visual means. Graphical diagrammatic
representations, for example, used in scientific discourse and on all manner of informational Web sites and printed materials, can convey very complex relations that words would render confusing and ambiguous. As Lemke argues, text and images together mutually contextualise one another and help to show up multiple layers of meaning. This does not involve tying it down to a single interpretation, but rather, through juxtaposition, allowing meanings to be generated that help communicate complexity – for example, the incommensurability of different perspectives. Ambiguity, in this sense, should not be confused with a lack of meaning.

The third problem, where a particular image is often held to be typical of a larger reality, is one that is not exclusive to visual ethnography. It mirrors the problem of representativeness and validity in qualitative research more generally. Every time we extract a citation from an informant’s interview, we need to think about and specify its typicality within the corpus of interviews collected. In image-data, the same question arises. Mead and Bateson, of course, addressed this problem by amassing vast archives of ‘typical’ images, so that any one selected image could be relied upon to represent the range of images collected. However, it is increasingly recognised within visual ethnography, as discussed above, that photographs and film cannot be taken as unproblematic, objective records of reality (Loizos 2000). Accordingly, simply amassing vast quantities of visual images does not mean one can safely ignore the issues of choice of subject, camera direction, framing, lighting, and all those other aspects of the grammar of film that we need to keep in mind.

In the 1960s and 1970s, such concerns led to the kind of filming which seeks to preserve the internal integrity or unity of a natural situation or event (Bazin 1967). In this approach, rather than fragmenting shots through post-production editing, long shots of entire scenes are preferred, where ‘the logic of the situation’ and ‘the logic of understanding’ correspond (Heider 1976: 107–9). Such a perspective takes it for granted that film can be an objective visual record. Nevertheless, even the most empirically-committed ethnographer also recognises that the way a film is shot can never be divorced from the specific intentions of the filmmaker. Sandall (1994) argues forcefully, contra constructionist perspectives, that visual footage can be an objective record, but he also recognises that immediately beyond it lie what he calls ‘the perplexities of Goffmania’ – the inevitably staged and untruthful character of social interaction. As Hockings (1994) asks, do the ‘emic’ meanings of the footage correspond to the ‘etic’ meanings imposed by filmmakers? And can these two kinds of meaning be so clearly counterposed when every filmmaker knows that there can be no such thing as ‘natural’ action that somehow simply ‘occurs’ in front of a camera?

Hastrup (1992a) has argued that cameras cannot capture all aspects of reality, and should not be presumed to offer a fuller or more accurate representation of the field than written text alone. For her, writing and film are hierarchically related: ‘writings may encompass the images produced by films, but not the other way around’ (1992a: 21). She cites de Certeau’s distinction between map and itinerary to distinguish between visual and written forms of authority in ethnography. She argues that photography and
film give us maps (a cultural tableau that can show us the bigger picture – the concrete differences and characteristics of the field) while textual accounts give us itineraries (a guided tour around the social space, which contextualises the map through an account of lived experience). She suggests the following distinctions in the uses favoured by ethnographic films and written ethnographic texts:

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<th>Films</th>
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Hastrup’s distinction between the different kinds of authority of filmic and written representation, though perhaps contentious for some, does help to alert us to the complex dimensions of terms such as ‘authenticity’ and ‘objectivity’. Necessarily, therefore, in approaching the project of multimodal ethnography, the relative ethnographic ‘weight’ and distinctive legitimising logics of the different modes employed will need to be carefully considered.

**Hyperlinks**

The final issue we wish to raise here concerns the transformative powers of hyperlinking as opposed to simply multimedia. In other words, what happens to multi-semiotic, multimedia meaning when we add hyperlinking into the melting pot? When we combine different modes through different media, *and* link these together through hypertext, what kinds of new, multi-semiotic meaning are produced? The hyperlink takes us beyond the question of combination, since the link itself carries meaning (see Chapter 3). Hyperlinking means that multimedia becomes even more complex. It is no longer simply the juxtaposition of image, text and sound, but the creation of multiple interconnections and pathways (or traversals) among them, both potential and explicit (Lemke 2002a). This is the new meaning potential afforded by hypertexts + multimodality, and it is what Lemke calls hypermodality: ‘the new interactions of word-, image- and sound-based meanings … linked in complex networks or webs’ (2002a: 300).

The task of trying to map the kinds of meaning produced by such hypemedia has barely been begun. Other chapters in this book attempt to interrogate the significance of the hyperlink, and Chapter 8 specifically addresses the question of how to understand the peculiar challenges it throws up for academic writing. As a whole, though,
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this book cannot attempt the wider challenge of producing a theory of hypertextual, multimedia meaning. Rather we are seeking to raise a series of issues for consideration by those interested in producing and engaging with multimedia and hypermedia ethnography. Our ongoing work, in conducting and constructing hypermedia ethnography, will hopefully allow us to begin contemplating, if not meeting, some of the wider challenges now confronting the project of ethnography in the hypermedia age. In the next chapter we take that forward by specifically addressing the hypermedia ‘toolkit’ of the ethnographer in the digital age.
An ethnographer going to the field ten or twenty years from now may take along as equipment a video camera, one or two microphones, a computer, disks or tapes for storage, a printer, paper and maybe some lights. (Seaman and Williams 1992: 306)

Seaman and Williams’ 1992 prediction has indeed proved true – at least for many researchers entering the field today. The plethora of easily-available technological resources threaten to turn qualitative research into a minefield of complexity. While the requirements of a ‘conventional’ ethnography are well-known, a digital-age ethnographer faces the challenge of becoming familiar with a wide range of digital equipment and computer software. Although plenty of literature exists about the use of audio-video recording equipment in fieldwork, as well as the use of computers in qualitative data analysis, there is no significant body of research about the specific demands posed by hypermedia in qualitative research. In this chapter, therefore, we will use examples from our experiences to illustrate the approaches we took to the difficulties that face a hypermedia ethnographer. We draw on these to suggest principles and recommendations for future projects. Naturally, our findings were grounded in a particular case study and influenced by the technology available at the time. Accordingly, given that the abilities and availability of specific computer hardware and software are in a constant state of flux, we will focus mainly on the general principles and decisions rather than making detailed analyses of specific technology.

When planning a hypermedia ethnography, the ethnographer will need from the outset to have a vision of the final product. While a conventional ethnography is usually oriented towards a printed monograph with its well-defined and understood format, a hypermedia ethnography is likely to be delivered in new, not-so-well-understood media formats. The choice of the delivery medium will impact on everything from decisions about what audiovisual equipment to use in the field, to how the fieldwork data are to be analysed, to choices about final narrative forms. Consequently, in developing a hypermedia ethnography the ethnographer needs to have a clear idea of
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the final product in order to delineate the equipment and skill requirements needed to achieve it. From the outset we found that even the decision to ‘think hypermedia’ started to problematise our prior conceptions of the ethnographic process.

One option is to deliver the final product on a removable disc such as a CD or DVD. Our choice in this particular case was to use a CD (DVD was not then readily available) to present the eventual hypermedia ethnography. This initial choice influenced every stage of our decision-making. Although we wanted to include a lot of video material, early calculations showed that it would be difficult to include more than 30–40 minutes of footage. In addition, although we did not know the exact construction of the final ethnography we expected that we were likely to have numerous short video clips of different subjects rather than a small number of lengthy clips. This had obvious implications for what we chose to film while at the site, a subject to which we will return in more detail in the next chapter. The advantages of this choice were both practical and theoretical. On the practical side, CD-rewriters had just become available at affordable prices. This allowed us to experiment with creating the final product as well as testing versions of it. The multimedia capabilities of a CD-ROM also enabled us to explore the potential for multi-vocality. Potentially there would be means, in text, sound, image and moving image to let a putative ‘reader’ explore the multiple ‘voices’ presented therein.

Compact discs (and DVDs), like any other kind of technology, present obstacles as well as opportunities. The multimedia capability of a CD-ROM enables the visual elements to be brought to the fore and to be combined with other media (see Chapter 4). Its storage limits, however, mean that only a limited amount and quality of video can be included. Indeed, over the period of our project almost everything we did was informed by the magical number 620. We had an absolute maximum of 620MB of storage space unless we decided to create an ethnography spanning multiple CDs. A project using a DVD may well be able to multiply the storage capacity by up to eight times, vastly increasing the range of potential material that could be included. Yet developers/authors/ethnographers will still need to be aware of what will and what will not fit.

There are alternatives to presenting hypermedia ethnography on CD or DVD (or any successor format). The most obvious choice would be to make the work remotely accessible, by hosting it on the internet in some manner, probably via a Web page. This has a different set of implications for the final product and, therefore, for the initial stages of a project. We discussed some of the issues involved in Web-based hypermedia ethnography in Chapter 3. In general, a Web-based product is less constrained by storage issues but severely more constrained by ‘bandwidth’ issues. Large, high-quality video clips require high-speed access to the Web site, something many users may not have. In addition, as a design feature the Web is intended to allow the users to customise their Web browsers. This means that when producing an ethnographic hypermedia environment the developer/author/ethnographer is faced with the knowledge that their site may look and act differently to different users. Any Web-based ethnography may also run into issues about limiting who can access it for reasons of confidentiality.
For our project the CD proved to be the most appropriate delivery medium. But as recent Web sites have shown (e.g. Tennant 2001; Wesch 2002a), the Web is also a potentially viable strategy.

Our choice of final product was, in this case, also informed by the desire to implement a 'hypertext strategy' during data analysis (Weaver and Atkinson 1994). Such a strategy features the use of hypertextual linking as an alternative to the more traditional 'code and retrieve' paradigm. The hypertext strategy, however, also creates the possibility of thinking about writing ethnography as well as analysing data. Indeed, the hypertext strategy breaks down distinctions between “data”, “analysis” and “presentation” (Weaver and Atkinson 1994: 6). Our aim was to investigate this argument by attempting to develop a hypermedia ethnography in which each phase of the research process was conducted in and informed by hypermedia; hence our term ‘Ethnographic Hypermedia Environment’ (EHE). To develop such an ethnography we wished to progress beyond already completed experiments such as those conducted by Peter Biella (Biella et al. 1997) or Weaver and Atkinson (1994), both of whom had used hypertext to help present and analyse a pre-existing data set. We intended to construct a hypermedia presentation that would feature fieldwork specifically conducted for the hypermedia ethnography. The fieldwork site chosen, the Rhondda Heritage Park, had previously been studied by Dicks (2000) and this new fieldwork would build upon that study.

**Data-recording**

In practice we worked with two data sets over the course of the project. Dicks had assembled the ‘original’ data set prior to the project. Consequently, these consisted of material that had not been intended to be digitised: a set of tape-recorded interviews with guides, the consultants involved in planning the heritage park and visitors. There were also various paper documents such as plans, sketches, reports, memos, and so on. The challenge with these records would be importing them into a digital environment. In addition new data were to be recorded specifically for this project and would include video-recorded interviews with the guides and visitor groups plus several days of ‘fly-on-the-wall’ style filming of the guides. These new records were to be made in a digital format to start with, providing us with the challenge of learning to use the equipment proficiently in the field.

We did not have much in the way to guide us. The only detailed account of a hypermedia ethnographic project that was available at the time was Peter Biella’s account (1993a) of the creation of his CD-ROM and even that had been constructed purely out of pre-existing fieldwork. Although research was being conducted that would later see publication (e.g. Pink 1997, 1999) we found ourselves in uncharted territory. We were able to adapt literature in the field of visual ethnography to inform us of some of the issues we would face, both theoretical and methodological, when using film in the field. In addition, the literature on computer-assisted data analysis (CAQDAS) gave us some insight into how a hypertext strategy might work. However,
in terms of what a fully worked-out hypermedia ethnography would look like, we were very much in the dark. Once we had decided that the intended product, a hypermedia CD-ROM, would be suitable for our purposes our task was, essentially, to work backwards and try to outline the various tools and skills we would need to accomplish the project. Although we could have delegated the various tasks to specialists and focused purely on the ‘creative’ work of the ethnography our intent was to learn what it would take for us to do everything. The outcome of this approach is that we were able to experiment with several ideas for structuring an EHE on CD-ROM using a variety of approaches to create several, incomplete trial versions. Essentially, we were using ourselves as an experiment and keeping logs of our experiences for future reference so that we could assess the tasks and skills required for this type of project.

**EHE building tasks**

In assembling an ethnographic hypermedia environment (EHE) there are tasks above and beyond that which would have to be considered in a conventional ethnography intended to be published in printed form. These include:

- **Input issues**: In general this refers to the need to digitise data so that it can be stored, organised and manipulated on a computer. In this respect the idea is to turn the computer into a virtual ethnographer’s toolbox. Some projects, especially those that utilise a lot of pre-conducted fieldwork, may require the handling of a lot of non-digital material, but even if all material is collected in digital format it is still a non-trivial task to input this data into a computer in a usable format.

- **Fieldwork issues**: Many of the findings of visual ethnographers are germane to fieldwork conducted for hypermedia ethnographies. However, although the basic technological issues may be similar (e.g. the challenges of using video in the field) the strategic choices of what to film are often quite different and do require a different interaction with the field. This is something that we will assess in more detail in the next chapter.

- **Data handling issues**: Although a hypermedia ethnography does not necessarily have to use a hypertextual data analysis strategy, it will be challenging to handle the wide variety of data forms no matter what strategy is chosen. A researcher is likely to have to learn several types of software (image editing, movie editing, scanning, video capture and so on) in order to be able to handle the data. Finally, one advantage of hypermedia, and digitised data in general, is the ability to present all of the data to the final reader. But if this step is taken it generates a whole series of extremely knotty issues centring on confidentiality and ethics.

- **Authoring and distribution issues**: The choice of software used is affected by decisions about the final product: for example is the end result likely to be a Web page, interactive disc (CD or DVD) or some other form of production? Similarly, the
The hypermedia ethnographer is likely to find that, as visual ethnographers have discovered, their fieldwork objectives became ‘aestheticised’. In other words, they may find themselves, at times, concentrating on those moments in the field that appeared filmic.

Over the remaining chapters we will discuss issues arising from all of these areas in more detail. Chapter 6 discusses digital-age fieldwork activities; Chapter 7 addresses data analysis and Chapter 8 focuses on the question of representation. Here we focus primarily on input issues and tasks involving choices of equipment, software and ‘tooling up’ in general.

**Input**

The standard input tasks facing a hypermedia ethnographer are likely to include document scanning, optical character recognition, audio/video capture and text importing. The document scanner becomes an important tool for any hypermedia ethnographer as it becomes the standard means for inputting real-world ‘things’ and turning them into collections of digital information.

- **Document scanning:** Although much of the data collected in a hypermedia ethnography may already be in digital form, there will, inevitably, be a need to digitise a wide variety of documents collected from the field. Many of these may be large, fragile, and/or valuable. As Robinson (1993) has noted, the tasks involved in accurately digitising such material are more complex than may at first be obvious.

- **Optical character recognition:** A scanner simply takes a digital image ‘bitmap’ of the original document. This is useful for inputting textual documents in the first instance, but in order to be able to manipulate that text digitally it is necessary to convert the bitmap image into a text document. This is what optical character recognition (OCR) software does. Present day OCR software can process typed documents pretty accurately but hand-written documents are still well-nigh impossible. Current software also allows the researcher a certain amount of control over how much non-textual information to include in the final textual document. By creating multimedia documents that contain text elements as well as images, a coffee stain (for example) could be captured as an image and placed in the document in the right position.

- **Audio capture:** This is likely to be most useful as a means of saving digital audio tracks to the computer’s hard disc. It can also be used for converting pre-existing, analogue audiotapes to digital sound files using a computer’s ‘Line-in’ connection (though the quality can be very poor). In addition, many researchers may still find that they wish to use analogue tape-recorders as back-up devices during fieldwork.

- **Video capture:** This involves using a specialist video capture card as part of a computer, which allows the user to transfer video from a tape to a digital file on a computer. It can become a rather complex and time-consuming process. Ideally the fieldworker
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will be using a digital camera in the field so that when transferred to a computer there is no degradation of the signal. In other cases analogue video formats such as VHS can be transferred via an analogue video capture card and then converted to digital video format. It is also possible that the researcher may wish to digitise supplementary video material (e.g. recorded news shows, informants' videos and so on).

- **Text import**: This can vary from straightforward copy and paste of plain text documents to more complex procedures involving databases, spreadsheets or obscure text formats. Although computer programs have become much better at sharing information, moving data from one program to another is always likely to create errors. For example, most wordprocessing programs such as Microsoft Word can produce special characters such as left and right quote marks, but when these are converted to other programs they often disappear or turn up as some other random character.

**Data handling**

Once material is digitised, an appropriate program or set of programs is needed to manage the complete data set. Ideally, a single program would gather together all the files into one place and manipulate them using a single interface. The intent of the hypertext strategy is to use a hypermedia authoring program that can move seamlessly between the interpretative and authoring steps. For a variety of technological reasons that we will discuss shortly, this is currently not possible. Accordingly, a researcher will probably be required to use a suite of different software packages to manage, interpret and present the data along with interpretative texts.

**Hypermedia production**

There are four main tasks involved in authoring a hypermedia production. Some of these tasks, however, vary according to the choice of final production medium.

- **Image editing**: Images have to be edited to make them the appropriate size and resolution for the final product. Some images may need to be compressed, others may need to be broken into smaller parts and confidential information may have to be anonymised. All of these tasks will require the researcher to become familiar with the appropriate software as well as the technicalities of the various image formats.

- **Audio/video editing**: This is likely to be one of, if not the, major tasks. As with image editing, decisions will need to be made about the dimensions, quality and length of included audio and/or video clips. Different clips may need to be edited together or have elements excised, for a variety of reasons. Also, the final product will greatly affect video editing choices. For example a CD-ROM can store around 40 minutes of fairly low-quality video without the use of advanced video compression techniques. A DVD can store significantly more while a Web site may have
massive storage capacity, but be unable to download video data quickly enough to make it viewable. All of this is going to require the researcher to become familiar with complex software as well as the technicalities underlying the wide range of digital video formats.

- **Hypermedia authoring:** This is, naturally, the central task involved in producing an EHE. Ideally, the researcher will use the same software in which the hypermedia analysis was conducted to construct a coherent, intellectually sound, hypermedia ethnography.

- **EHE production:** The details will vary depending on choice of delivery platform. In our project we used a CD-ROM as, at the start of the project in 1997, CD-rewriters were just becoming available. DVD and the Web have now also become viable choices. Choosing a strategy for successfully completing an EHE is part of the research agenda. In our case, our chosen strategy was to accomplish all of this with hardware and software that was available ‘off the shelf’ rather than creating or paying for custom-designed packages. Clearly, different projects will operate with different assumptions, which may depend on budget, available resources and time as much as they may be informed by theoretical concerns. Our project was intended to be exploratory and we wished to discover just how far non-specialists could progress under their own steam to assess the viability of the off-the-shelf approach. Although using specialist software and relying on IT specialists to deal with the more complex programming issues would undoubtedly have simplified our lives, the intent was to do things as ‘lay’ social scientists/ethnographers and not to attempt to gloss over issues in technology. By attempting to do absolutely everything ourselves we were able to examine every (often painful) effect that the technology had upon the ethnographic research process.

**Hardware choices**

Regardless of the strategy involved for conducting an EHE there are, of course, certain minimum hardware requirements. Using off-the-shelf instead of custom bespoke software and/or hardware will influence the choices for each item. In addition, the fast development of digital technology means that there is no merit in assessing specific details here. However, taking the above into consideration, the basic hardware requirements for an ‘off-the-shelf’ hypermedia ethnography are likely to include the following:

- high performance multi-media computer system with digital video capture card;
- flat bed scanner;
- video camera;
- still camera;
- audio-recorder;
- CD/DVD (re)writer, or computer to act as a Web site host.
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Naturally, this breakdown assumes that the ethnographer is working on a self-sufficient basis. If there is access to a media centre with complex video editing equipment and multi-media production capabilities, or the use of a ‘team of specialists’ model, the ethnographer can assume less responsibility for the technical details of the equipment. That said, any hypermedia ethnographer is going to have to digitise their data and manipulate them somehow, and the suite of equipment just outlined is probably as necessary for the researcher as a wordprocessor and printer is for the conventional writer.

Assembling the best possible collection of equipment appropriate to the project and its strategic requirements is, in and of itself, crucial. For example, choosing the most suitable camera and microphone is extremely important and merits careful consideration. Indeed, the selection of video- and audio-recording equipment for data collection is a decision that needs to be taken early, well before entry into the field, to allow sufficient time for the ethnographer to become competent in its use. Acquisition of video skills through training and practice will certainly enhance the quality of the final EHE: just as writing skills need time to develop, so too does the handling of a video camera (see Chapter 6). Aside from the use of the camera, its specifications are also important.

The video camera

Digital video cameras are now within reach of most research budgets; however, their quality and specification varies widely. The market encompasses small, hand-held, consumer-oriented models, which are easily stowed and unobtrusive, as well as larger, heavier, shoulder-supported professional and semi-professional models, some of which are used by media production corporations. The extent to which the ethnography envisaged requires unobtrusive, lightweight and highly movable equipment (e.g. in action settings such as difficult terrain, or where the ethnographer needs to be self-effacing) will help determine this initial choice. For obvious reasons, the bulkier models have more features, control and flexibility, and record higher-quality sound and pictures. The lens quality, image-recording chip size and audio-recording quality will all be lower in hand-held models; these also tend to lack easily accessible manual controls over both picture settings (focus, white balance, etc.) and audio settings.

We took several wrong steps in choosing the right camera. Originally we had planned on ordering a small consumer-oriented camcorder in order to maintain flexibility in our budget and unobtrusiveness in the field. After some bespoke video training (at Manchester’s Granada Centre for Visual Anthropology), we realised that our initial ideas were hopelessly naïve. Consumer digital camcorders tend to have a small lens, no audio recording control, use only a single processor chip, and often lack sockets upon which to mount external microphones. In addition they tend not to be particularly durable, although the usual caveat of constant development and price reduction should be borne in mind here. Consequently, we decided that we would need to invest in a ‘semi-professional’ camcorder. Although, obviously, consumer-standard digital video is becoming more affordable and of better quality, the differentiation between
consumer, semi-professional and professional equipment is likely to remain. The requirements of the project and possible future projects should guide the researcher in deciding which level of equipment to purchase.

For our project, we decided, after much consultation, to buy a SONY DCR VX1000E. At the time this and its more expensive version (VX9000E) dominated the field and were widely used by broadcast companies such as the BBC. Again, specifications and models change frequently but the principles behind our choice were fairly general. First, the camera had good lens life with high resolution, better ‘shoes’ for microphones, good low light capabilities (we would be doing a lot of filming underground) and access to a battery belt (enabling us to film for several hours before having to recharge batteries). Second, and crucially, the camera could output data via a ‘firewire’. This is a high-speed cable that was originally designed by Apple and has become fairly standard. Because digital video requires downloading vast amounts of information to a computer, an accurate, high-speed connector such as a firewire port is highly desirable.

The microphones

In general, while it is relatively easy in the field to obtain good quality video pictures (although mistakes can easily occur), it is much more difficult to obtain consistently good quality sound recording. All kinds of ephemeral noises, often unnoticeable to the human ear, can ruin a soundtrack. Low-level buzzing from electrical lights, computers, heating and air-conditioning systems, intrusive noises out-of-shot, the difficulties of picking up group-talk evenly, are all classic problems faced by the video-ethnographer. One has to be continually aware of the soundscape. Many ‘how to’ guides have been written and we would certainly recommend consulting a good manual on sound recording and equipment.

The audio-recorders

As with all hypermedia qualitative research, it is important to match the technology to the project’s requirements and budget. In our Rhondda project, we did not initially accord audio-recording an important role. Consequently we used a simple hand-held tape-recorder with a basic omni-directional microphone. In our current project, by contrast, we have learned better, and have used a semi-professional standard minidisk recorder. In general, if complex soundscapes or a large number of qualitative interviews are to be sound-recorded then a good quality audio-recording system is essential. At the consumer level, hand-held tape-recorders and minidisk (MD) recorders are the usual options. The latter, in particular, are becoming increasingly popular with researchers. There are, however, inevitable compromises in sound quality with consumer models. If such equipment is to be used then it is vital that, at the very least, the recorder has a manual audio level control. Although the sound quality may not be the best, this equipment does have the benefit of being small and easy to carry in the field.
Yet there are several issues to consider with MD technology. First, many assume beforehand that it will be easy to transfer a minidisk recording from the player to a computer. In fact the cheapest MD recorders are no better at doing this than an analogue tape-recorder. In addition, MD transcription equipment tends to be more expensive than analogue tape equivalents, with no increase in functionality. Recently it has become more common to find minidisk recorders that are ‘NetMD’ enabled. This means that it is possible to transfer sound digitally from a computer to a MD player via a ‘USB port’ (high speed connection used for data transfer) but not the other way around. Currently, MD recorders can only upload sound as an analogue file, meaning that it has to be done in ‘real time’ (it will take 1 hour to upload 1 hour of sound) and meaning that there will be some degradation in quality. Finally, it should be noted that all MD recorders store the sound they capture in a proprietary format that is unique to MD. It is not inconceivable that in the future this format may become defunct, possibly leaving the researcher with minidisks that would require specialist equipment for their playback.

At the semi-professional level there is a wide range of equipment available – from analogue recorders to new ‘solid-state’ recorders. If the project is going to require extensive use of sound in a final presentation then it is recommended that semi-professional standard equipment is used. Regardless of the technology chosen, it should have the following capabilities.

- Dual microphone control with separate manual recording levels for each microphone;
- Ability to connect to professional quality microphones.

In our current project, we are using a HHB semi-pro MD recorder. It is fairly rugged, can be carried over the shoulder on a strap (enabling us to accompany participants as they go about their work) and has a variety of recording modes. In addition, we can upload sound through a USB connection – although an analogue signal, it is very high quality with minimal degradation.

If the budget is more generous, one could consider the new ‘solid state’ recorders. Unlike MD recorders and tape-recorders which record onto a medium, solid state recorders digitise the sound immediately and store it in memory. Until relatively recently, the expense of memory was such that these recorders were impractical and often capable of holding no more than 30 minutes or so of sound. But these recorders are now becoming more feasible for research purposes. The advantage to such a recorder is that, once digitised, recorded sound stays in its digital format, enabling fast and almost error-free data transfer. Although they are currently still expensive, the explosion in hand-held, solid-state music players (e.g. Apple's iPod) and their increasing use as portable storage devices indicates that this is likely to become an increasingly available option.

**The stills camera**

When our work was first funded, consumer-standard digital cameras were a rarity. We ended up paying nearly £400 for a Sony model that exhausted its batteries within
30 shots (on average) and took nearly a second to recharge between photos. Although it had some capabilities which are now standard, such as an LCD viewing screen, it was relatively inefficient. At the time of writing, consumer-level digital cameras not greatly inferior to the model we used can be bought as key chain accessories. Presently there is an almost bewildering choice of digital cameras available.

Choice of camera equipment will depend on what part photography will play in a research project and whether digital or analogue (i.e. ‘traditional’) cameras are most suitable. Analogue cameras are cheaper, and researchers may value the ability to use specialist films, processing equipment and manual techniques. Such considerations may outweigh the flexibility of digital photography. The main advantages of digital over analogue photography are the ability to inspect photographs at the moment of shooting and edit, delete or comment on them and, if needs be, retake them. A digital camera can also be used as a medium for interaction with research participants, wherein they can inspect photographs in situ and comment. In addition, digital images can easily be uploaded onto computer, making it possible to integrate them into other documents, such as fieldnotes, immediately. Finally, all but the cheapest digital cameras offer a small amount of sound and even video-recording.

As with most equipment, the choice is between consumer standard and semi-professional standard. Consumer level digital cameras tend to be ‘point and shoot’ devices with the vast majority of the activity being automated. Such cameras make taking competent photographs fairly close to foolproof. Cameras vary in the amount of ‘mega-pixels’ they provide (higher mega-pixels meaning higher resolution and detail), the number of recording chips they have (the standard right now is for ‘3ccd’) and the amount of memory that comes as standard. The more memory, the more photos can be stored at once. At the semi-professional level, cameras often have no greater memory of resolution but offer greater control over settings. In our current project we are using a semi-professional digital camera by Fuji (FinePix 602). This camera can work fully automatically but can also be set manually, allowing us to take photographs in a variety of settings that would otherwise be problematic. This means we can capture more that is ethnographically significant. For example, by using a longer exposure we can indicate movement (see Figure 3). In all cases, of course, it should be remembered that the more professional-level technology will require greater skills from users – so investing in time for training and practice is essential.

The computer

Perhaps surprisingly, choosing a suitable computer is likely to be far less complex than choosing the other media equipment. This is because most contemporary personal computers can handle the intensive processing needed to deal with digital video. Computer storage and processing power problems are, for the most part, issues of the past. Probably the most important feature of the computer required for this type of project is the monitor. Any hypermedia project is likely to require a large monitor to enable digital video manipulation. The monitor we used for our project has a 20-inch
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(50 cm) screen and this is the minimum we would recommend for anyone wanting to work with the type of intensive video that is likely to be required for hypermedia authoring.43

Presently there are three main operating systems for personal computers: Windows, MAC-OS and Linux. The vast majority of present computer systems use Windows as the operating systems but MAC-OS, the system used by Apple, is very popular in the media industry as well as in many American universities.44 The most recent Apple systems come with DVD-writers as standard, and are oriented around image and video editing. Linux is an ‘open source’ operating system that can run on both Apples and PCs. In practical terms, there is no reason to recommend the use of one system over the other. Apple computers tend to be more oriented towards multimedia uses while Windows computers do generally have access to a wider selection of software. As of writing, Linux is still somewhat intimidating to non-expert users and lacks significant software support; this, however, is changing. Currently a hypermedia ethnography could be constructed on either a Windows PC or Apple. Generally you should choose what you are most familiar with and which is best supported in your environment.45

Currently we would recommend using a dedicated desktop computer for a serious hypermedia ethnography. Although notebook computers offer convenience and could be carried to the fieldwork site, the smaller screen, and general reduction of processing power and storage capacity for a greater cost can prove to be too much of a disadvantage. The increasing popularity of notebooks within the media industry may well alter this recommendation in future years. It is noteworthy that the latest Apple laptops, as with their desktops, are oriented around multimedia applications including video capture. In general, however, it is probably safe to say that any up-to-date computer will be able to handle the tasks required for the production of a hypermedia ethnography. The main issues are likely to centre on digital video storage and the medium in which to produce the ethnography.
Digital video is likely to remain the most memory-intensive part of any hypermedia project for the foreseeable future. In an ideal world, one could copy the entire video footage of an ethnography onto the hard drive of a computer. The rapid cost-reduction of computer memory and storage means that this has become more of a possibility. For example, when our project commenced the practical maximum hard disc size available to us was 4GB and, due to the limitations of Windows 95, this had to be divided into two virtual discs of 2.1GB each. In 2004, many home computers came with over 120GBs of disc space. As you read this, capacity will undoubtedly have increased again but hard disc storage capacity will likely always remain an issue that researchers have to consider.

Regardless of how the hypermedia ethnography will be delivered, a DVD-writer is likely to be essential for the next decade. As of writing, DVD-writers are now common components in consumer-level computer systems. Even if the intent is to mount the work on the Web, the ability to create DVDs featuring the work is a huge advantage. And DVDs also make a handy storage medium for file back-ups. The main problem with writable DVDs presently is that there is more than one standard. As with the old betamax and VHS formats in early videotapes, it is possible that you could end up buying a DVD-writer only to find out that its format does not become widely adopted.

In general, the issue of propriety software and competing standards will be problematic for hypermedia ethnography. There is no guarantee that a work produced for a current computer will be viewable on one in ten years time. Similarly, as Peter Biella (1993a) discovered, the software chosen may simply be neglected by its manufacturers. There is no easy solution to these problems. To a certain extent, creating a hypermedia work requires an act of faith that future software will be able to access current software. That said, the industry seems to be increasingly aware of this issue. It seems less likely that débâcles such as the BBC Domesday project, in which a huge archive was converted to a laser disc format that is all but unreadable now, will occur in future.

Software choices

When I began work on the project, I could find no software applications which would serve my purpose. (Biella 1993a: 336)

As Peter Biella discovered, finding appropriate software can be difficult, time consuming and, occasionally, fruitless as it often requires the ethnographer to put programs intended for a certain use to one not foreseen by the original developers. Assuming an off-the-shelf approach, and in addition to the normal raft of computer programs used in academic research and writing, a hypermedia researcher is likely to require software programs for the following functions:

- data handling and analysis;
- audio/video editing;

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- image editing;
- optical character recognition;
- hypermedia authoring.

**Software for hypermedia analysis**

Various CAQDAS programs are now well established in qualitative research, though none can be called a dedicated hypertext or hypermedia program. *StorySpace* remains in our view the most powerful hypertextual (although not, unfortunately, hyper-media) program on the market. *Nvivo*, from Qualitative Software Research, marks an attempt to create a CAQDAS program that does not simply offer a new way to code and retrieve. Although *Nvivo* does include coding, its focus is on assigning keywords and indexing data. Possibly the most important evolution it offers is the ability to edit data once they are imported into the program. Other CAQDAS programs tend to require data to be left untouched once entered, while *Nvivo*, in fact, *expects* that the researcher will edit data as they analyse it. In this respect *Nvivo* can help create a more holistic research environment – one of the goals of the hypertext strategy. The program also includes hypertext links and the ability to display multimedia. Unfortunately, it fails to provide the important functions required, in our view, for a fully-fledged hypertextual analysis strategy (see Chapter 7). Furthermore, although *Nvivo* can handle multimedia, it cannot aid in its analysis; the multimedia display is purely for representational purposes. On the other hand, *Nvivo* does also function as a (re)presentational environment. For example, an author can create viewable documents about the research using *Nvivo*, and present that research using the free ‘viewer’ version of the software. In this respect *Nvivo* does come near to satisfying the desire expressed by Weaver and Atkinson (1994) for software to provide a single environment in which to store, interpret and present qualitative research. Although *Nvivo* is not appropriate for a fully hypertextual strategy, it does present an alternative method for implementing certain of the goals of a hypertext strategy.

*ATLAS.ti* is more proximate to hypertextuality. It includes both hypertext and the ability to code multimedia. Of most interest to us is that it lets the user mark up all types of multimedia (something we will discuss in more detail later). It is also possible to create hyperlinks between different media. The problem is that *ATLAS.ti* does not include any means of following those hyperlinks. Although the program provides a tool for graphically inspecting hyperlinks (called ‘network views’), it is impossible to ‘click’ on a hyperlink and follow it to its destination. Accordingly, although it is possible to create hyperlinks, one cannot create a readable hypertextual network. That said, *ATLAS.ti* does also include the important ability to name links, which means that it is possible to create extremely powerful relationships among all manner of data. As such *ATLAS.ti* provides a partial implementation of a hypertextual analysis strategy.

Both *Nvivo* and *ATLAS.ti* illustrate that it is possible to conceive of hypertextual CAQDAS programs. Unfortunately, neither can, presently, be used in a fully-fledged hypertext strategy, though *ATLAS.ti* may well make a good supporting program with...
its ability to create hypertext networks out of visual data. *Nvivo* embodies an approach that seeks to create a more integrated research environment without making use of hypertext. By contrast, *ATLAS.ti* demonstrates a way in which to link multimedia without fully implementing hypertext.

**Software for hypermedia authoring**

The choice of hypermedia authoring software is likely to present the greatest problems because, at the time of writing, dedicated qualitative hyperauthoring packages do not exist. There is no program that can handle both analysis and authoring in the same package. Presently, and for the foreseeable future, the hypermedia ethnographer is going to be required to become familiar with a suite of software products and be creative in their use.

One major factor underlying the choice of software will be the relationship between the data analysis software and the authoring strategy. One approach is to use a well-tested CAQDAS program (such as *NUDIST*, *Nvivo* or *ATLAS.ti*) to manage and aid in the analysis of data. Once that step is complete then the findings could be presented in a sophisticated multimedia program such as Macromedia’s *Director*. Such a process has the not inconsiderable advantage of using programs for their intended purposes. The main choices will then come down to picking the most appropriate programs. An alternative procedure, and the one we explored in our project, is a hypertext strategy that integrates the data analysis and representational steps within a single hypertext/media environment: the EHE. The big disadvantage to this approach is that the software to implement it fully is not, as of the time of writing, yet-available.

The most complicated part of the software evaluation process is likely to centre on the choice of software with which to construct the EHE. To reiterate, we wanted to find a program that could handle analysis of a large hypermedia data set and present that data set, along with the completed analysis, as an electronic ethnography. This is a lot to ask for in one computer program. When Weaver and Atkinson (1994: 5–6) first experimented with a hypertext strategy, they used a hypertext software program named *Guide*. In 1997 when we started our project, although *Guide* was still in existence, it was not commercially available. Accordingly, through necessity as well as choice, we had to choose a different package.

Although there have been many CAQDAS programs produced in the last fifteen years, very few of them included any significant hypertextual capabilities at the time we were constructing our project and none of them were specifically oriented towards hypertext. More recently, *Atlas.ti* and *Nvivo* have incorporated some hypertext functionality and *Atlas.ti*’s graphical ‘network views’ can be used to create and manipulate hyperlinks between selected data segments which makes it the most promising candidate for use in a hypertextual approach. Generally, though, anyone wishing to undertake a hypertext strategy is likely to have to adapt hypermedia authoring software that is usually intended for a different application. As usual, the range of software possibilities seems to change monthly. So, rather than giving a survey here that would be out
of date by the time this book was published, we will, instead, present an overview of the different authoring models that tend to inform the various programs that are usually available.

Three main paradigms for hypermedia authoring systems have emerged: structural, temporal and sequential (Hardman 2000). Each has been developed to address the difficult issue of integrating temporal media such as video and audio with non-temporal and spatial media. For example, a sound file only has meaning if it is played over a period of time; conversely, a still image has spatial dimensions and no temporal dimension, per se. Temporal approaches to hypermedia are those that adopt a master ‘timeline’ to synchronise all the elements. Sequential approaches do not create a master timeline but, instead, elements with a temporal dimension simply start when they are encountered and contain all their timing instructions internally. Finally, structural approaches generally create hierarchical tree structures and the spatial/temporal attributes of a node are usually derived from its position in the structure.

Temporal hypermedia programs
The classic implementation of a temporal hypermedia authoring paradigm is Macromedia’s Director. It is the industry standard for producing hypermedia that features highly complex synchronisation between video, audio and text. Director’s main tool for creating hypermedia is ‘the score’. The score is, essentially, a timeline that controls what starts when and when it finishes. By placing various elements on the score it is possible to create something akin to an interactive movie. In addition, because it is possible to ensure that elements on the score are synchronised to within fractions of a second the developer/author can ensure that, for example, a transcript would be viewable as a scrolling text at the same time as a video clip. In many ways Director portrays hypermedia as a type of multi-sequential movie and most of the interface is designed to be reminiscent of video editing programs.

Whereas a normal movie simply progresses from the beginning to the end in a unilinear fashion, a Director hypermedia presentation can be navigated through choices made available to the viewer. This is particularly suitable for hypermedia that features a lot of video but relatively little text and relatively infrequent linking (Hardman 2000). Such programs could therefore be used to construct an EHE which is conceived of as primarily visual with relatively little complex linking. The primary problem, however, is that there is no way to use Director in the analysis stage of the EHE due to the lack of sophisticated link manipulation. It would, however, be possible to conduct data analysis in a CAQDAS program and then create a hypermedia presentation of those findings in Director. This would not, however, be a fully-realised, start-to-finish hypertext strategy.

Sequential hypermedia programs
The most accessible example of a ‘sequential’ (sometimes known as flowchart), hyperauthoring system is Authorware, also by Macromedia. This program is intended specifically for creating instructional interactive hypertexts. Authorware implements
sequential hyperauthoring by conceptualising the hypertext as a series of media elements placed within a flowchart. When a user ‘starts’ the hypertext the program literally starts at the first media element and then proceeds around the flowchart based on the user’s interactions. Figure 4 shows part of an Authorware flowchart showing a line, representing the flowchart, and icons, representing media elements. The presentation starts at the top of the screen, and each icon contains information about what type of media is to be displayed, where on the screen to display it and how long to display it for. In this case, the first icon, called ‘box’, draws a box on the screen; the next icon displays a piece of text, and so on. The right arrow at the bottom is an ‘interaction’ icon, which halts the progress of the hypertext until the user makes a relevant response to some question on the screen. In this case, it is waiting for the user to type a, b, or c and then, depending on the user’s response, the presentation can take several different paths. Progression around the hypertext then can be seen as a dialogue between the author and the reader.

The advantage of a flowchart system is that it allows for sophisticated interaction with, and potentially control over, the user. The disadvantage is that it becomes impossible to synchronise precisely the playing of multimedia elements. In a timeline program everything in the hypertext is synchronised to a master clock, thus allowing precise display of, for example, textual transcript with its associated video. In a sequential model there is no such master clock. Consequently, it is impossible to attain exact synchronisation of events, although in most cases the variation will not be noticeable to the naked eye.

As already mentioned, sequential hypermedia programs have tended to be popular for computer assisted learning (CAL) and e-training purposes. Sequential systems tend to excel at sophisticated interaction with, and control over, the user’s choices and responses. This may well make them particularly suitable for EHE’s that are oriented around pedagogical goals.

**Structural hypermedia programs**

Presently there are no structural hypermedia authoring programs, although GRiNS (an authoring program for SMIL hypermedia) contains structural elements. Eastgate’s StorySpace is the closest example. However, this program does not deal with temporal media (such as video and sound) and is closer to a textual hypertext. StorySpace has been explicitly positioned as a tool for creating literary hypertexts and appears to be primarily developed for the Apple Macintosh system. Although a StorySpace hypertext does not have to be structured, with its various graphical interfaces the program encourages the author to think of nodes as existing in *families*. The main advantage of its approach is in making the business of creating text nodes and sophisticated linking quite easy. In addition to this, the program has the most powerful hypertext linking facilities of any currently available software. Unfortunately, the inability of the Windows version of StorySpace to handle audio/video material (the Apple version 2.0 can present QuickTime video) makes it unsuitable for hypermedia ethnography unless the researcher decides to handle multimedia separately.
The World Wide Web was not initially designed to include audio/video material. Consequently, it was never conceived as a hypermedia product. Although audio/video material can now be displayed on the Web, it often has to be played by 'plug-in' programs that do not, on the whole, allow sophisticated linking. That said, developments such as the invention of ‘Style Sheets’, which allow better control over placement of elements on the screen, and SMIL, which incorporates temporality into Web pages, have made the Web more viable as a hypermedia environment. We will discuss some of this potential later.
As can be deduced from the discussion, there is no one program currently available that can be used at all stages of the construction of the EHE. Some programs can produce complex hypermedia presentations with different strengths and weaknesses, but cannot be used as a hypertext data analysis aid due to the weakness of their linking abilities. The Web, too, can be used as a medium for presenting an EHE but not as one in which an EHE can be developed and used for hypertext data analysis. Conversely, other programs provide powerful linking and the ability to inspect the links made, but lack multimedia support. This makes them useful for hypertext analysis, and for authoring a purely textual hypertext, but less capable of producing a fully multimedia EHE.

**Our own software choices**

In our project, we chose to perform the data analysis stage in *StorySpace* and the authoring stage in *Authorware*. Initially, after early trials, we had thought that *Authorware* would be capable of data analysis, as it did include what appeared to be sophisticated hyperlinking facilities and a navigation toolbar. It was also, compared to other hypermedia authoring programs, relatively easy to learn, and did not require any programming expertise. Unfortunately, we realised after several months of experimenting that *Authorware* simply did not include text linking nor did it include link naming. Indeed it was our experiences with *Authorware* and what it lacked in hypertext functionality that led to us drawing up the hypertext software wish list in Chapter 7. After several consultations we were forced to acknowledge that although *Authorware* could be modified to achieve a certain amount of our wish list, this would take customised programming. Our strategy was, however, to avoid customising and to work with off-the-shelf products. Consequently, we were, once again, faced with either abandoning part of the hypertext strategy and adopting a tried and tested CAQDAS program for the data analysis, or revisiting our choices of hypermedia software. The former option would work against the objectives of our particular project, so we decided to look into the possibility of doing the data analysis in one program and then presenting the final product in *Authorware*. As all of the other hypermedia programs had the same problems as *Authorware* when it came to data analysis, we turned once again to *StorySpace*. This excels at linking, though falls down at multimedia functionality.

We had initially ruled-out *StorySpace* because it did not handle audio or video files in a Microsoft Windows environment. It was, however, the only really sophisticated hypertext program that was readily available. Therefore, we considered the possibility of importing the data into a *StorySpace* hypertext, creating all the links we required for analysis and interpretation, and then exporting the final product into an *Authorware* presentation. This still would not help us to analyse the non-textual data but it had become clear that our initial hope of being able to develop and present the hypertext in one environment was not going to be realisable. A series of conversations with the developer of *StorySpace*, Mark Bernstein, plus conversations with authors who had previously used *StorySpace*, and experiments with the demonstration version of the program, convinced us that developing in *StorySpace* and then presenting in *Authorware*
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was the most viable option. (Hypermedia video data analysis proved to be an intractable problem and is discussed later.)

*StorySpace* offered several hypertextual facilities that we came to regard as key.

1. **Simple data importing and editing:** It was easy to import textual data into hypertext nodes. These nodes could then be moved around the hypertext as required. Consequently we could edit data after they were imported into the program. We could also create and subsequently edit links.

2. **Graphical data views:** The program offered several ways of looking at the imported data. For example, the very useful ‘map view’ (shown later in Figure 5) lets us see the data as nodes with all the links among them graphically displayed.

3. **Link types:** The program supported both ‘text’ and ‘basic’ linking (see Chapter 3).

4. **Link naming:** A key feature, and an essential feature in any hypertext program, is the ability to give names to links. Names could express logical relations (‘contradicts’, ‘supports’), content (‘Ivor’, ‘Busty’) or conceptual/theoretical relationships (‘memorialism’) and so on.

5. **Link analysis:** *StorySpace* featured a ‘Path Browser’ that allowed us to follow links with the same name. For example we could follow a path of links with the name ‘Ivor’. Hence, during analysis, one can gather together into one ‘path’ all the links possessing a certain name, and then rearrange or modify them as required.

6. **Dynamic linking:** *StorySpace* also made it possible to disable links temporarily or to change the destinations of links depending on other conditions (see Chapter 3). This facility is primarily useful for fiction writers but promises potential value for ethnographers, too.

7. **Keyword search and retrieve:** It was also possible in *StorySpace* to assign keywords to nodes and then search the hypertext for keywords (as well as other types of search). This is very useful, again, for the analysis stage.

Our decision to use *StorySpace* for one task and *Authorware* for another was not, with hindsight, a bad one. Although we were initially reluctant to split the development and representational sides of the project, we were at least staying within an overall hypertext strategy. Had we adopted the CAQDAS–plus–*Director* model we would have been unable to explore the potential of hyperlinking for the analysis stage. We did consider whether or not to switch the presentational software to *Director* in order to take advantage of its superior multimedia capabilities. We remained with *Authorware* for several reasons. First, we had already acquired a fair amount of expertise with the program and did not want to take the time to learn new software. Second, *Authorware* is simpler than *Director* for beginners to use. Third, it is capable of producing well-presented ethnographic material (see, for examples of ethnographies created in *Authorware*, Pink 1997, 1999).

We have given a long description of our trials and tribulations because it provides an insight into the kinds of issues any potential hypermedia ethnographer will face until such time as specialist software becomes available. For now, any ethnographer wishing to
create hypermedia will have to become familiar with a suite of computer programs and be prepared to handle data in one program before creating a final product in another.

**Data input issues**

Digitising a hypermedia project’s data sets adds an extra level of complexity to the research process. The advantage of hypermedia is that it is possible to make links between data in a variety of media; the problem is that handling the data becomes extremely cumbersome. Data that are generated in a pre-existing digital form (digital video, email, digital images) is relatively easy to download to a computer. In addition, digital data can be transferred as often as required with no degradation. Analogue data requires more care. A multimedia computer will be provided with at least one audio jack so that analogue audio can be imported and digitised. Analogue video will require a video capture board to convert the original into a digital video format. The problem with this is that some information is inevitably lost in the conversion.

Inevitably, a major task in an ethnography of this type is digitising images with a scanner. Although the intent of a digital ethnography is to generate material wherever possible in purely digital format, it seems likely that there will always be some material that needs to be digitised, such as, for example press cuttings, promotional materials, informants’ materials and so on. Some material could be photographed and then downloaded to a computer. Where possible though it is far better to use a scanner and gain a higher quality digital image.

**The ins and outs of scanning**

For us the scanner was required for two primary purposes: to scan images and printed documents that formed a part of the pre-existing data set. The scanner we chose was the Hewlett Packard ScanJet 6100C. It is a flat-bed scanner with an area of $216 \times 356\text{mm}$, allowing us to scan a wide range of materials of different sizes. The rationale for our choice was to find a scanner that could handle large documents, hence the need for a flat-bed scanner rather than one with a document feed, and had the highest resolution we could afford.

Our scanner had an optical resolution of 600dpi (dots per inch [236 dpcm (dots per centimetre)]). Generally speaking, the higher the resolution of the scanner, the more detail one can capture. This can, however, be a mixed blessing. A one-square-inch image that is scanned at 600dpi will be 600 pixels wide by 600 pixels high when it is displayed on a computer screen. To understand what this means, our own university works on a standard ‘SVGA’ monitor system so a normal computer connected to the network shows an image that is 800 pixels wide by 600 high. Consequently the one-square-inch image would take up the entire height of a monitor and three-quarters of its width. This is clearly undesirable as a standard $5'' \times 3''$ ($127 \times 76\text{mm}$) photograph would end up being nearly as wide as four screens and as high as three monitors.
The other issue when it comes to resolution and scanning is storage space. A one-inch image scanned at 600dpi requires approximately 1MB of file storage unless it is compressed. With the decreasing cost of storage this is becoming less of an issue but, particularly if you intend to present the hypermedia on a CD-ROM or DVD-ROM with video, a large number of images can soon add up. A 5" × 3" (127 × 76mm) photograph scanned at 600dpi and saved uncompressed would require just under 16MB of space meaning that you could get a maximum of 38 on a CD-ROM (with no room for anything else). Obviously the images can be saved in a compressed format; the same image saved as a high-quality compressed ‘JPEG’ image requires approximately 5 per cent of the storage space. Consequently you could hope to store about twenty times the number of images.

The alternative to file compression is to scan documents at a lower resolution in the first place. This has several benefits. Standard photographic paper is printed at a resolution of 300dpi. Consequently, scanning at a higher resolution effectively magnifies the original when seen on a computer monitor, which means that minor blemishes not noticeable on the original could become very obvious on the digital image. Halving the resolution from 600dpi (236 dpcm) to 300dpi (118dpcm) would reduce the file size to one-quarter of the original (a 16MB image could now be saved in 4MB). It would also reduce the size of the image as seen on a computer monitor: a 5" × 3" (127 × 76mm) photograph would now be 1,500 pixels wide by 900 high. Similarly if the scanning resolution is reduced to 150dpi (59dpcm) then the image would require only 1MB of storage space (reducing to around 20k when compressed to a JPEG image) and would be 750 pixels wide by 450 high, enabling the image to fit on to most standard monitors.

There is a final, somewhat complex, relationship between monitor and image resolution (to do with the size of a pixel on a computer screen) that has an important impact on how a final hypermedia ethnography will be structured. Every monitor is set to a certain resolution that can be changed by the user; the relationship between the size of the monitor and its resolution affects the actual size of the pixel and, therefore, the resulting image. The SVGA standard, when viewed on a (as of writing) standard 14" (35.6cm) monitor displays an image which is 800 pixels wide by 600 high on a screen which is roughly 11 inches (27.9cm) wide by 8.25 inches (21cm) high. What this means is that for a typical monitor an image which is 72 pixels square will be approximately one inch square (2.25cm) in size. Consequently, an image scanned at a dpi of 150 (59dpcm) will appear to be twice its original size when displayed on a monitor.

In creating a hypermedia ethnography one inevitable issue is the placement and size of images. We were working to a SVGA standard for our presentation; consequently any image that would be larger than 800 × 600 pixels would require special handling. In addition the main area of the presentation was sized at 640 × 480 pixels to allow room for other windows. Consequently we were reluctant to show images that were larger than 640 × 480. Taking the final product into consideration along with the need to store and manipulate some rather large images we decided to scan colour images at 150dpi (59dpcm). These images were then saved as uncompressed files in a file designated as an image archive. We would then edit these images later and save the edited...
images separately for inclusion in the EHE. Originals, such as pencil drawings and typed documents in which colour was not an issue were scanned at either 300 (118) or 600dpi (236dpcm) but with the scanner set to black and white, allowing us to capture more detail but without any increase in file size.

**Image handling**

Becoming proficient with image editing software is another of the various skills the hypermedia ethnographer has to acquire. Aside from the basic techniques of image resizing and resampling, to produce a hypermedia product the researcher needs to understand the various image compression techniques available and which are most appropriate for which type of graphic. Although the major graphics programs (such as Adobe’s *Photoshop* or Corel’s *Photopaint*) are extremely powerful, most of their features are oriented towards advanced manipulation of the graphics and the basics can be learned quite quickly. We required extensive use of our image editing software for two purposes. First, we wanted to place all the scanned images on the EHE in a manner that made them accessible to the user. Second, we would be using a portion of the images in a narrative manner as part of the analytical ‘tours’ we intended to create.

Making our image archive accessible was potentially difficult because the images themselves were a variety of odd shapes, many of them significantly larger than could be fitted on to the 800 × 600 window. Also, as we intended to put the EHE on a CD-ROM we would have to compress the images so that they could all be fitted on. Like us, any hypermedia author is going to have to become familiar with the two main image compression formats: JPEG and GIF. JPEG is ideal for compressing colourful images such as photographs that do not feature large blocks of the same colour and has become, for all intents and purposes, a de facto standard (for more detail see Robinson 1993). JPEG compression is, however, unsuitable for certain types of graphics: those with large areas of single colours or black and white images. In the first case, JPEG compression tends to make large areas of the same colour look very ‘blocky’ while black and white images (for example scans of pencil drawings) often end up taking more space than the original. For both of these types of image we used GIF compression. GIF does not compress as well as JPEG and is only capable of showing 256 colours in a single image. It does however compress black and white images and images with large areas of the same colour far more effectively than JPEG and without the ‘block’ problems.59

There are many ways of deriving a system for handling and manipulating an image archive and the eventual presentation of these images in the ethnography. Biella et al.’s *Yanomamo Interactive* (1997) scanned the majority of images at 75dpi and stored them in an uncompressed format, requiring 150MB of storage out of the 640MB available on his CD.60 He also scanned a few at 300dpi (118dpcm) in order to allow a user to magnify them. In total his ethnography used over 380MB of storage for photographs. Sarah Pink’s *Interweaving Lives* CD (1999) focuses primarily on video footage and uses nearly 500MB of storage for that. Consequently there are relatively few still images.
Similarly, her earlier CD, *The Bullfighter’s Braid* (1997), used 43 small, uncompressed images saving the majority of the space on the CD-ROM for video.

Our choice was to create an archive of uncompressed images scanned at 150dpi (a small number were scanned at 300dpi or 600dpi for specific reasons). These images were then stored on our hard drive with back-up copies put on to CD. When presented in the final EHE most images were scaled down to about half-size, meaning that most of our images could, effectively, be magnified to what would appear to the user to be double-sized. By differentiating between an archive of high resolution uncompressed images and the compressed versions we were able to place a lot more on the CD. A potential problem for the future would be if the image compression techniques become so outdated as to render our images unviewable. Although that sounds like a real concern there is also no guarantee that future computers would be able to open uncompressed images either. Predicting the future with computer technology is risky at best and failing to take advantage of present technology because it might lead to problems in the future seems, to us, to be overly cautious.

**Digital video**

There are a number of particular issues around the use of digital video with which the hypermedia author needs to grapple.

**Video and audio storage**

The main issue that confronts the hypermedia ethnography is audio-video storage capacity. Both audio and video files are extremely space-demanding. For example one hour of video recording stored as MPEG-1 NTSC D2 (the standard North American format) requires about 640MB of storage space. More advanced formats such MPEG-4 and Windows Media Video formats make it possible to compress the files into much smaller sizes. However, the more a file is compressed the more processing it takes for a computer to play it. Although audio does not require as much space as video it is still not trivial to deal with. A one-hour audio recording in WAV-format (the standard Windows format) saved at ‘radio’ quality (11 kHz, 8 bit, mono) takes 37MB of space. The higher the quality, the more space required. MP3 sound format, which has been made (in)famous by the practice of music downloading, can compress audio down to about 10 per cent of its original size. As with most image compression, audio-video compression tends to be ‘lossy’, which means that a certain amount of audio-video degradation will occur. Generally, however, this degradation is not noticeable to an untrained observer.

Handling digital audio-video files was one of our biggest challenges. The main issue we had to confront, however, is one that is rapidly becoming unproblematic. While we had a comparatively small computer hard drive (the dedicated video capture computer had a 10GB hard drive and ran using Windows 98) current computers tend to start with 40GB at minimum. At the top of the present market it is possible to buy a computer...
with a 160GB hard drive for less than we paid for our original computer. Consequently, unless a researcher plans on shooting vast amounts of video it seems likely that most contemporary computers will be able to store the entirety of a project’s audiovisual data on a single hard drive. We did not have this ability. Instead we were limited to keeping an archive of all our video on the original digital tapes and then capturing just segments of it. These segments were then copied onto CDs for later use.

**Video format(s)**

The other issue facing the hypermedia ethnographer concerns digital video format. There are various competing, and unsurprisingly fast-changing, formats available and understanding the difference is a major task in its own right. At present there are three main formats that are likely to be relevant.

- **AVI files** are the markers of Microsoft’s proprietary video-for-computers player, ‘Windows Media Player’. The advantage of this format is its commonness. Anyone who has a Windows PC should be able to play an AVI file. Recent upgrades mean that these files can be extremely well compressed while remaining very high quality.
- **MOV files** are generated by Apple’s Quicktime player. These files have become widespread because it is the standard format used for major motion picture trailers when placed on the Web.
- **MPEG files** (which currently come in four formats, MP-1 to MP-4) have been developed by the motion pictures group (http://www.mpg.org) and are as close to an industry standard as exists. MP-1, 2 and 4 are video formats while MP-3 is an audio format. MP-2 is the format that is used for DVD movies and MP-4 is a major upgrade of MP-2 that is becoming popular for downloading movies (legal and not) from the internet.

The situation is made more complex because, generally, the different players are able to play video in multiple formats. In as much as there is a standard it is MPEG, though the newest version, MP-4 has attracted some competition. The problem for anyone considering producing hypermedia products is in choosing the right format in which to store video and then produce it in the final product. At the moment anything which is used to create MPEG files tends to be expensive and geared towards the professional end of the market. The increasing commonality of DVD-writers seems likely to change this.

We found ourselves working with video in AVI format for no other reason than it was relatively easy to work with and we could afford a digital video capture board that would output simple AVI files. As with most of our choices we found the technology to be a constraining factor. At the same time, as we were expecting to create a CD we were limited in the quality and quantity of video that we could eventually use. Consequently we decided to stay with a relatively old and common type of AVI file so that the CD would be as easy to use as possible. This decision meant, however, that we would only be able
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to use about 40 minutes of video in our final product. (If additional resources had been available, though, we would have chosen to use the MP-2 format.)

The technical problems of capturing and storing video caused severe difficulties at all stages of the project. As well as the issue of creating a final product we had several dilemmas based around the initial video capturing. As with an image scanner, a digital video capture board can work to produce captured video at a variety of resolutions, frame rates and compression ratios. Because high-quality video required vast amounts of storage that we didn’t possess we settled on capturing just certain sections and then copying those sections to CD. This had major implications for how we conducted the video data analysis. We had hoped, initially, to use the same piece of software to handle all of our data but that was quickly revealed to be impractical. Consequently we had to choose a specific program to help us analyse the video data. We will discuss the software we used, Adobe Premiere, our methods of using it and the rationale behind both in the next chapter.

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Time for hypermedia

Hypermedia development takes time. It is still a complex and demanding undertaking. Peter Biella estimates that developing the ethnographic CD-ROM, Yanomamo Interactive, took 70 weeks of labour with an approximate cost of $100,000 (1997).63 Biella had the advantage of not requiring any new fieldwork, and only having to deal with about one minute of video. In addition, all his images were black and white. Even then he anticipated that it would take an extra six months for him and two assistants to finish the product.

One unexpected element of the process is the sheer amount of time and knowledge required to evaluate, choose, purchase and learn the appropriate hardware and software. Social scientists often significantly underestimate the work needed to integrate new technology into the research process. Annette Markham’s (1998) account of her naïve assumptions about how much time would be ‘saved’ when she started her online ethnographic work provides a good reflexive example of this. Our experiences were similarly chastening.

Difficult and complex as it may be, we remain convinced that the potential of hypermedia for ethnography – and for social scientific research generally – is immense. As Biella also discovered (1997), the production of hypermedia requires costs, skills and labour that are more akin to the production of visual ethnography than a printed one. That said, we believe that ongoing improvements in digital technology and evolution in hypermedia authoring software will create a general simplification of some of the tasks involved.64 Although hypermedia authoring will likely always be more complex than print authoring and there are currently many theoretical as well as institutional issues to be addressed, the practical obstacles are in the process of being overcome.

One of the findings from our experiences was the need for centres of expertise from which a researcher wishing to use hypermedia to a greater or lesser extent could gain advice. Presently any social scientist hoping to take advantage of the potential of
hypermedia risks having to reinvent the wheel. Such centres could offer everything from specialist equipment and software advice to services such as data archiving, online and print libraries and, perhaps, the ability to host hypermedia research productions online. Many UK universities and institutes already possess media centres and it would be a relatively straightforward procedure to adopt the model for hypermedia research centres which would combine the practical tools and intellectual energy required.

**Future directions in software development?**

The pace of development in computer hardware and software means that even in-between writing this and the book seeing print there will be significant changes. There do, however, appear to be certain trajectories that can be indicated. Since 1997 the major CAQDAS programs have become faster, handle multimedia better than they did and come with more features. But there have been no really revolutionary changes. **Nvivo** is a relatively new program from QSR, the makers of **NUD*IST**, and this does branch away from what could be called the CAQDAS mainstream. However, as these programs are successful at what they do it seems unlikely that revolutionary changes will be forthcoming.

**StorySpace** currently remains the only widely available hypertext authoring program. The Apple version of the program has recently been upgraded to include some basic multimedia capabilities via the media player **QuickTime**. A multimedia version for Windows PCs is also being developed. There have been few other significant developments in hypertext authoring. There has been an increasing interest in authoring hypertext/media for the Web and it seems likely that this will become even more popular. Stand-alone hypermedia authoring programs (such as **Authorware** and **Director**) continue to be successfully produced although it is noticeable that **Director** has become increasingly integrated with the programs that facilitate internet-mounted hypermedia, while **Authorware** continues to be focused towards CAL while branching into online presentations.

The Web itself has changed vastly since the inception of our project. In particular, it has become much more adept at handling multimedia and its (re)presentational abilities, in general, have been vastly improved. ‘Style Sheets’ allow Web users to position text and images precisely on a screen as well as facilitating better control over design elements. A multimedia language for the Web (SMIL) creates the possibility of synchronised multimedia on Web pages. In addition, the recent conversion of HTML to XHTML and the development of XML (discussed earlier) promises to provide much richer data linking. In many ways the most notable internet development has been the increase in bandwidth for connections, especially in North America. Greater connection speeds combined with faster, more powerful computers have allowed developers to increase the multimedia content and sophistication of their pages. The Web can certainly be seen now as a possible medium for hosting Ethnographic Hypermedia Environments.
Resources for the future

Our experiences with ‘tooling up’ for this project have allowed us to generate some widely applicable principles. Peter Biella described the production of a hypermedia ethnography as being more akin to creating a movie than writing a book (1993a: 307). He believes, as do we, that gradual simplification of the technology allied to a general increase in computer literacy among ethnographers will ameliorate this. There is no doubt, however, that hypermedia ethnography is demanding and time intensive. The ethnographers must become adept with a wide range of technology and become proficient in a number of skills.

It is significant that as of writing there is no hypermedia software package that can fully implement the ethnographic hypermedia strategy we have in mind. In this respect there has not been much progress in the last decade. Peter Biella was forced to learn how to program a piece of software called HyperCard in order to produce his work. We ended up having to use one program to develop the structure of the project (StorySpace), one to create video clips (Premiere) and one in which to present the EHE (Authorware). More generally, there remains a split between data analysis software (NUD*IST, Nvivo, ATLAS.ti and so on) and (re)presentational software. The potential of the hypertext strategy is that the same techniques that are used for data analysis can be used for ethnographic presentation. Our experience has shown us that there is a real need for a hypermedia authoring software program that can handle large data sets. Such a program would open up exciting possibilities for new research theories and methodologies.

In our discussions with hypertext authors – both of fiction and non-fiction – and developers it became clear that a ‘good’ hypermedia authoring software package is the ‘Holy Grail’ of the movement. There are significant technological and theoretical challenges to producing such software. Presently there is something of a split between literary hypertext ‘writers’ who have embraced the notion of hypertext as poststructuralist literature, and multimedia ‘producers’ who view hypermedia as akin to a more complex type of film. Any program which can combine sophisticated hypertext with multimedia elements will be useful for both camps as well as the academic or ethnographic ‘hyperauthor’.

As hypermedia becomes ever more prevalent we are faced with a range of new opportunities as well as challenges. Being able to integrate the skills of visual ethnographers with computer-assisted data analysis and hypertext theory in a centre, or centres, of expertise would provide a much needed resource. It would, hopefully, allow future hypermedia ethnographers to focus more on their work and less on the technology.
This chapter discusses aspects of fieldwork practice that present particular challenges for the hypermedia ethnographer. These challenges are not unfamiliar to ethnographers using more conventional methods, especially visual methods. But the multimedia dimension means that fieldwork becomes a decidedly multi-task activity, for it involves becoming acquainted with an expanded repertoire of methods for observing and recording field data. In addition, these data potentially become more broadly defined. Moreover, the fact that the entire data set may later be accessed by readers within the computer screen environment also brings important issues to the fore. This chapter particularly addresses methods for the visual recording of insights and observations about the fieldwork setting, and will address issues of how visual and other fieldwork methods can be reconciled.

Fieldwork and data

Fieldwork can usefully be thought of as inter-related sets of activities: defining (and accessing) the field; observing and understanding; and recording insights and observations. We suggest in this chapter that adopting a hypermedia approach has implications for all three. As we outlined in Chapter 4, we avoid the term ‘data collection’, as this suggests that data are simply inert materials lying around in the field, waiting for the researcher to come along and ‘collect’ them. We further noted the confusion caused by the fact that the term data often refers both to the field records that are made by the researcher, as well as to that which s/he observes (Emmison and Smith 2000). In order to avoid this confusion, we talk here about data-recording methods, rather than data-collection methods.

In one sense, talk of ‘data’ in ethnography is somewhat inappropriate. The methodological language we use, such as ‘data’, ‘observation’, ‘recording’, ‘analysis’ and ‘findings’,
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all come from positivist models of empirical research, and do not necessarily reflect the complexity and contingency of study in the social and cultural fields. Nevertheless, qualitative social science has often absorbed them quite uncritically. The separation of data and analysis only really makes sense if we think of data as neutral, observable empirical phenomena that are later subjected to a separate process of analysis resulting in ‘findings’. In contrast to this, the ethnographer is working with people, their accounts and their cultural environments. In this case, the ethnographer is constantly engaged in a process of interpretation as s/he engages with research participants and their environments (Hammersley and Atkinson 1995). As we suggest in the discussion that follows, the inclusion of visual materials in ethnography, and especially video film, means that the terms ‘data’ and ‘analysis’ become especially problematic.

Our use of the term data also recognises that ethnography involves the creation and representation of knowledge. It can be understood as referring to all the observable elements of the field (in their rich multimodal and multimedia diversity). Here we mean observable in a non-positivist way. What we can observe is the phenomenological world we encounter perceptually, using all available human faculties for ‘seeing’ (and indeed hearing, touching, smelling – even tasting) its significance. Fieldwork involves various means of, first, observing and understanding this diversity in a systematic way and, second, recording these observations in a systematic way. In this chapter, we argue that hypermedia can help bolster the systematicity and variety of both activities. It potentially both broadens and deepens the activities of fieldwork. However, we do not wish to claim that its inception radically alters the nature of fieldwork in and of itself. Rather, hypermedia is one form of response to a cluster of developments in ethnographic and methodological thinking more generally, in which traditional concepts (such as the field, data, representation, and others) are becoming redefined and reconfigured.

**Defining the field in hypermedia ethnography**

As we argued in Chapters 1 and 4, hypermedia potentially redraws the boundaries around the subject-matter of qualitative research and ethnography. Certainly, hypermedia is not the only impetus behind such problematisations, although it is undoubt- edly suggestive of them (or, perhaps it is better to say, hypermedia is resonant with current ‘post-paradigm’ thinking in ethnography and qualitative methods). For example, in its current phase of flux and realignment, ethnographic theory has been critical of the conventional category of ‘the field’, traditionally the term that covers the subject and site of ethnographic study. It has been seen as too fixed, too contained and too one-dimensional. Hypermedia, too, echoing these critiques, undermines the idea of clearly demarcated field boundaries.

The field is increasingly conceptualised by ethnographers as an expanded and more fluid space (see Chapter 2). The field was classically seen as a seemingly deep-frozen
cultural essence, residing in one temporal and spatial location. In critiquing this construct, ethnographers have recognised their own complicity in essentialising and totalising other cultures (Fabian 1983). Writings on globalisation have also been influential here, showing that local culture is fully implicated in, and constituted by, wider processes of political and economic change. Burawoy (2000) makes a compelling argument for a ‘global ethnography’. Accordingly, although ethnographers will always be concerned with understanding the micro-histories of people in their own space and time, this space and time is no longer seen as fixed and unitary. Instead, it is permeated by the diverse times and ‘non-places’ of wider, global interactions (Augé 1995).

Culture is also increasingly seen as networks of interactions among different people, rather than as an objective totality existing over and above people’s own phenomenological worlds (Bauman 1992). In contrast to the empiricism of earlier approaches, ethnographers now recognise that they cannot produce a description of the social world that is completely independent of their observations of it. They, too, engage their own ‘selves’ in interpreting those of ‘others’ (Coffey 1999). This view relates to the so-called reflexive turn in ethnographic theory and praxis. It has led to an enhanced effort to give space to others’ voices in their own words, letting them as far as possible speak for themselves, alongside the voice of the author. In this sense, ethnographic texts are becoming more multivocal, and the myth of the silent author dislodged.

There has also been a recently enhanced sensitivity to the diversity of modes and media that characterise any one environment. And there is increased recognition of their meaning-making potential (or ‘affordances’ – see Kress and Van Leeuwen 2001). As a result, as well as fragmenting, the field also deepens. It can now be seen to include a more diverse range of ethnographically-significant, meaningful features. Accordingly, impelled at least partly by the new accessibility of multimedia resources, ethnographers are starting to pay greater attention to the multiple semiotics of environments. In addition, the proliferation of design practices in an increasing number of everyday environments has also foregrounded the many dimensions through which any one cultural setting communicates. For example, both urban streets and countryside destinations are increasingly subject to ‘make-overs’ by professional interpreters, who strive to make every aspect communicate certain messages as part of a harmoniously themed whole (Dicks 2004). In such a world, researchers are increasingly called upon to interpret the effects of the material dimensions of meaning-making: all the objects and structures (their colour, size, shape, and so forth) that make any one research setting communicate at a number of different levels.

There are implications for the means chosen for recording observations of data in the field. As the field splinters and deepens, so too will the observational records the ethnographer will need to make. Traditionally, these records have taken the form either of fieldnotes or camera-images (or perhaps a combination of both). Fieldnotes necessarily become more dense and wide-ranging if they reflect not only the voices of ethnographer and subjects but also other texts (such as mass media and promotional texts) and subject-matters (such as global, inter-site relations and economic flows),...
In this way, the increasing permeability of field boundaries also becomes reflected in the range of recording media that the ethnographer may exploit. Accordingly, field-notes or camera images alone will not necessarily be a sufficient way of recording observations and thoughts. Sound, for example, long a relatively neglected field in ethnographic research, may move further into the foreground. Listening carefully to the soundscapes of a fieldwork setting may help to focus attention on what are its non-photographable, non-writable elements (see DeNora 2000).

Hypermedia potentially reinforces this fuzziness through the concept of *links*. This encourages the ethnographer to approach the ethnographic subject associatively, freely exploring a diversity of topics suggested by the research agenda. This is because the authored product of hypermedia ethnography (what we have termed an ‘ethnographic hypermedia environment’, or EHE) potentially allows all field data to be explored by the reader rather than being kept in the filing cabinet. Since a typical EHE will offer various levels of analysis, and can itself contain links out to other Web sites that are in turn linked to many others, the demarcation of clear field boundaries becomes increasingly irrelevant. Hence, hypermedia potentially affords an enhanced capacity to represent the field’s multivocality, permeability, multimodality and interconnectivity. There is, accordingly, a cultural ‘fit’ between hypermedia and the redefinition of the field in ethnographic theory. We suggest that, by pushing the field beyond observable interactions in designated settings, hypermedia encourages the fieldworker to think of more and diverse materials as potential data and to explore how these are inter-related. Of course, this multiplication and diversification of fieldwork materials brings pitfalls as well as gains. Potential problems such as data-overload, never-ending data ‘collection’ and over-burdened, cumbersome analysis should also be acknowledged. Yet, the inherent flexibility and malleability of hypermedia environments means that there is potentially greater scope for understanding, at a number of different levels, the complexity of the social world under investigation.

We are not arguing that hypermedia radically changes the nature of field data in and of itself. Even where their intended end-product is a written, tightly-controlled, linear text, ethnographers can clearly work extremely creatively with a variety of different data. Whatever the authoring technologies utilised, good ethnographies will always provide rich, multi-layered and thick descriptions that do justice to the complexity of the social relations under investigation. Indeed, in Chapter 2 we discussed a number of ethnographies which have experimented with narrative form from within the discipline of writing, and which have succeeded very well in conveying the inter-relatedness and complexity of the social world (see, for example, Dorst 1989). We are not proposing, therefore, that hypermedia representation and analysis are essential prerequisites for ‘good’ ethnography. However, our own experience suggests that what we might call the ‘hypermedia imagination’ is intrinsically amenable to representing and problematising traditional boundaries around research subjects and settings.

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Case study: ‘Visual dilemmas’

Defining the Rhondda
There are two senses in which hypermedia informed how we defined the field in our own project. First, it expanded our conception of relevant data. Although our research setting – the Rhondda Heritage Park – is a physically bounded site with an entrance and exit, our hypermedia approach encouraged us to see it as much more porous and inter-textual than that. For example, there are a number of publicly-released videos and films made about both the geographical area and the occupational lifestyle that the museum seeks to represent. In the EHE, these other texts could potentially be linked in to the environment, to challenge ‘our’ reading of ‘our’ field. Of course, copyright laws limit the reproduction of publicly-distributed video. However, one could obtain the necessary permissions (which we were unable to do because of time constraints). In that way, postcards, books, videos, films, all kinds of pre-existent public representations, could be brought into the ambit of the EHE. For us as ethnographers, this would help to locate the museum, and indeed our own ethnography, within an extensive patchwork of representational projects about mining, class and the industrial valleys of south Wales. One could also ‘hook up’ one’s own ethnography with others, through creating appropriate links between two EHEs. Traditional print would of necessity exclude such possibilities. Of course, as already noted, print ethnography is not blind to such insights simply by virtue of confining the final product to physical written pages. However, the knowledge that the final representation is to be in hypermedia form, we would argue, brings in those other multimedia documents as intrinsic, self-supporting elements of the ethnography itself. They do not need to be translated into a separate monologic mode.

Second, hypermedia methodology helped to sensitise us to the various semiotic dimensions of the heritage environment we were studying. Our minds were focused on multimedia meanings simply because we knew that more of these different media could be incorporated into our end-product. We argued in Chapter 4 that recording media (such as cameras and pen-and-paper) inevitably reproduce a narrowed range of media compared with the multimodal nature of the field setting. Three-dimensional, tactile, material environments are transformed into two-dimensional film or writing. These losses should certainly be acknowledged. Yet there is also a sense in which simply wielding a camera makes one look at the field in a more visual way than one would without it. Similarly, the inherent technical challenges of obtaining good quality sound means that one starts to go around the field with an increasingly sensitised listening ear. In our case the social divisions within the site that we were beginning to notice (particularly between the ex-miner-guides and the Park’s management) became clearer through attention to tone of voice: the guides ‘onstage’ versus ‘backstage’ voices, for example; the administrative staff’s ‘visitor’ versus ‘office’ voices; as well as the cultural signifiers
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of regional accent among the visitor groups themselves. All of these signifying modes are then capable of being directly accessed by the EHE reader through onscreen sound and images.

(Source: www.cf.ac.uk/socsi/hyper/chap6)

Choosing data-recording methods

There is a danger in hypermedia ethnography that data are recorded in a range of media simply because digital convergence has made it possible. As a result, there is a temptation to take into the field every available recording device and aid, including video camera, lights, various external microphones, tripod and stick, digital stills camera, and minidisk sound recorder. Data overload is just around the corner. There will be no time left even to inspect all these records, never mind analyse them closely. Further, the technologically encumbered researcher will run the risk of alienating participants. It is always worth asking the question: what knowledge can be gained through the camera lens that cannot be acquired through the human body and brain alone?

Some research settings are just not amenable to cameras. They may not be very ‘visual’, they may have many hidden contexts or the research questions may not be answerable through visual data. Hastrup (1992a), for example, found that her photographs of a highly male and sexually-charged Icelandic ram exhibition utterly failed to capture either the experience of being there or the cultural significance of the event. Some research settings, like our own museum one, are very visual and almost call out for the camera; nevertheless, some of our research explorations were difficult to represent in visual terms. We found it important, therefore, to use the camera quite selectively. With hindsight, we would have paid much more attention to gaining high-quality sound. Using sound alone for interviews, and not always feeling compelled to switch on the camera, can produce a more nuanced and meaningful record of voice – in what is necessarily an artificially constrained situation. Readers of the EHE would then be able to hear all the semiotic qualities (of cadence, intonation, accent, rhythm, etc.) that written transcriptions sometimes lack. Even where transcriptions do use notation for non-verbal aspects of communication, it is difficult to ‘hear’ these in the written text.

Multimedia data records

This brings us to a consideration of data in hypermedia. To what extent should we approach data differently in hypermedia as opposed to conventional ethnographies? The first point to note is that hypermedia allows a variety of media to be included in the ‘final’ EHE on computer. These can include recorded sound, still images, moving images and written text. However, this seemingly simple fact actually brings into play a host of problematic issues for ethnographers to confront. For these images, sounds and
written texts take the form of both data-record and representation, within the same electronic space. This has implications for the way in which data are defined in the field.

As we have been arguing in this book, hypermedia is not a simple blending together of principles established elsewhere, i.e. in the fields of visual and written ethnography. Rather, it is a multi-semiotic form of ethnography (see Chapter 4). As ethnographers are not restricted to one medium, they need not feel hidebound by all the conventions established within that medium. Anthropologists and sociologists have always had to convey everything they want to say in either a film/films or a book/books (or both). The film or book has to accomplish everything in film or book form. In film, this has meant ensuring that everything is filmed which is subsequently going to be needed. Similarly, in written ethnographies, interviews, observations and focus groups have to yield the data that analysis suggests is essential. When one can use both filmic and textual narrative, however, any gaps in filmic or other data-recordings obtained can be supplemented with material collected in other media. For example, the written word can step in to explain cause and effect where video footage is not amenable to accomplishing this through film montage. Similarly, a well-chosen camera shot can economically show a human reaction that an interview question would struggle to pursue. In this way, as we suggested in Chapter 4, data in different media can be harnessed for making different kinds of observation. For example, theoretical exegesis and statistics can be handled with written words and numbers; personal autobiography with sound; place-description with photographs; analysis of social issues through film montage. In such a way, as Biella (1993a) points out, film – long considered inherently unscholarly – can be reintegrated into writing-based scholarly work. Images and writing no longer have to be relegated to different universes. Further, in hypermedia camera-work, one is not required to choose between still and moving images (thus subverting the traditional photographer/filmmaker split). Nor is one obliged to choose between montage, sequences and shots. Accordingly, filmic data can range from single stills, through short uncut frame-sequences, to short montages and even (given the requisite storage capacity) full-blown edited films. Similarly, written data can range from single words, through screen-length texts, to interview transcripts and entire books. This means that the hypermedia ethnographer is able to be more relaxed about the need to collect data that can ‘speak for themselves’ in one medium alone.

Yet, at least in our own experience, this seemingly happy vision of blending together the two media of film and writing does not turn out to be as easy as it first looks. This, we suggest, is due to the different conventions that have been developed within each subdiscipline. Where trained in written methods, ethnographers have developed a set of approaches to fieldwork which are particular to that medium. For example, analysis typically involves a lengthy period of post-fieldwork immersion in written records, such as fieldnotes and transcriptions, often (and increasingly) aided by computer software. By contrast, there is not such a well-established set of procedures for dealing with visual analysis – particularly of the moving image. Indeed, Emmison and Smith observe that ‘the concept of “visual data” has never really been thoroughly
explicated’ (2000: 3). On the other hand, there has been considerable discussion and debate within visual ethnography about camera-work and the implications of different shooting styles (see Chapter 2). There has been rather less attention paid to the making of fieldnotes – with much of the debates over perspective and voice in ethnography’s ‘reflexive turn’ focusing on the activity of representation rather than fieldwork itself.

Accordingly, we suggest that it is often difficult to treat both visual and written fieldwork methods with the same level of rigour. One can easily spend considerable amounts of time worrying about camera techniques in the field, and then doing little in the way of systematic analysis of the resultant visual records. (We shall turn to a full discussion of analysis in the next chapter.) Conversely, one can dedicate less energy to thinking about the making of fieldnotes, sound recordings and (technically unaided) observations, yet vast amounts to the analysis of written texts. Some of this unevenness is due to the sheer amount of time that mixing methods involves. But some of it, as already suggested, is due to the different traditions that have grown up around the different media. In what follows, we consider some of the differences between these traditions, in order to start thinking afresh about how to achieve a more integrated approach.

Data in written versus filmic ethnography

It is useful to consider how the word ‘data’ has conventionally been treated in the two subdisciplines of print and film ethnography. When the end-product is a piece of writing, the fieldwork phase is usually conceived of as separate from and prior to the practice of representation. Observations made in the field are first recorded by various means (classically, by written fieldnotes, but also by the use of still and moving cameras and microphones). Subsequently, these data records are analysed and interpreted at length, often after the fieldwork phase is complete. Obviously, there are different approaches to this sequencing of data-recording and analysis, including the classic grounded theory one where researchers keep returning to the field after different phases of analysis to refine emergent interpretations (see Glaser and Strauss 1967). But usually analysis is conceptualised as a separate phase even though, as in most ethnographic work, processes of analysis and interpretation begin as soon as fieldwork commences (Lofland 2004).

The final stage is the production of a written interpretation: the ethnography itself. Whatever the level of blurring between fieldwork and analysis, this representational phase remains separate, as it involves the production of a continuous written representation. This phase is in an important sense independent of the data records. That is, the data records are deployed within, but not constitutive of, the finished account. So, extracts or quotations from participants’ speech are interwoven into the writing and gain their meaning largely from within the rhetorics of this account. As we have discussed in earlier chapters, more experimental writing forms give greater print space
to fieldwork voices, presenting the author's voice as just one among many (Chapter 2). But fieldwork voices, in all their modal diversity, are still subject to a process of translation into the restricted modes of academic writing. And they are deployed within the ethnographer's interpretative structure. It is this structure that plays the major role in steering the reader towards particular interpretations of the extracted texts (Atkinson 1992).

In this way, print ethnography cannot really help confirming the power of the author's written representation to 'stand in' for fieldwork voices. As Harper puts it, 'the point of view of subjects is offered in quotes, separated from the rest of the text, keeping the voice of the author in control' (1998: 133). So print representation is an activity that involves the translation of fieldwork data records (whether camera images, sound-recordings or written fieldnotes) into a single medium, i.e. that of writing. Hence, written representations stand in for something that is necessarily absent, i.e. the multimodal field itself, as well as multimedia data records (where used). The process of writing is often commenced while fieldwork is ongoing, certainly, but the data records are always in an important sense prior to, and replaced by, the production of the writing itself.

This is not, however, the case with film and video. In these, the data records themselves are the very stuff out of which the finished representation is built. As the camera-equipped ethnographer goes about making a record of field relations, s/he is also producing the material that will constitute the subsequent representation. The images and sound recorded are the same images and sound that will make up the film. In this sense, it is rather difficult to make a clear distinction between data and representation. One could argue, in fact, that there is no category of 'data' or 'data records' in ethnographic film that corresponds to those categories in print ethnography. And for this reason, no doubt, the analysis phase in film has classically been less well-defined and theorised. This is not to say that film is more transparent than writing (see the discussion in Chapter 4). The camera does not 'capture' or record the field directly. Quite aside from the poetics and politics of camera-work practice itself (the cultural implications of how one wields the camera), the film or video producer/editor can 'manage' the meaning of the finished representation in various ways. Decisions over how to exploit this power are related to key debates in visual methods. There are two ideal-typical filming styles, much discussed in film ethnography (see the discussion of montage versus naturalism in Chapter 2). Either the sense of the film is constructed (largely) in the post-production editing suite, through techniques of montage, or it is constructed (largely) within the field itself, through camera-work.

In post-production, new material may be added in after fieldwork filming is over. Editing can cut away, manipulate and juxtapose images, creating entirely new meanings. Sound, too, which is often added in after filming is complete, supplies important dimensions of 'extra' meaning to the finished film. It can be used similarly to written narrative, to tie the meaning of images down, making it clear how they should be read. Expository filmmaking (i.e. with narrative voice-overs) embraces this logic. Hence, there is considerable power – if one chooses to use it – to produce a film's meaning
within post-production activities. Decisions about the degree of post-production intervention will depend on one’s political-ethical choices about how to film. If one is happy using a good deal of sophisticated editing techniques, for instance, with lots of cuts and asynchronous sound, then much of the meaning of the finished film will be produced from this work of assemblage, or montage. Yet, even in such a case, not all of the meaning can be produced in the editing suite. The images shot in the field still have to be capable of conveying some of the sense of what the ethnographer wants to convey. No amount of editing can make a film meaningful if the footage simply does not show what is required. This is particularly the case in more reflexive styles of filmmaking. In reflexive, non-expository filming styles, speech is not approached as an objective conferer-of-the-truth, but as a number of subjective voices. These voices are often those of fieldwork participants speaking their own stories, and cannot be manufactured after the event.

Where a more observational or naturalistic style of filming is preferred, editing is used only minimally or even rejected altogether. In this case, images shot in the field – together with synchronous sound – will have to convey virtually all of the intended sense of the finished film. This credo insists that meaning must ‘come from the culture itself; it must be materially gathered in the field and not composed later from a world outside’ (McCarty 1995: 73). This means that camera images will have to be very carefully selected in the field. Nothing is more frustrating for the filmmaker than to arrive in the cutting room to find that amidst all the accumulated images, crucial footage is missing – footage able to communicate in and of itself what the ethnographer has found to be significant. And this is the crucial point. Making the right kind of choices about what and how to film involves already understanding the ethnographic significance of the field being studied. In other words, while the classic phased written fieldwork project records data first and then analyses these records, it has been argued that filmic ethnographies have to be based on analysis that has already been undertaken (Asch 1992).

In Bateson and Mead’s (1942) mixed photographic-and-textual ethnography of Balinese culture, for example, the two anthropologists had already spent several years in Bali doing intensive fieldwork and publishing scholarly monographs, before they took up the camera (Harper 1998). In our own case study, similarly, one of us had already undertaken a lengthy period of analysis of the chosen research site. Accordingly, we were already familiar with certain ethnographically-significant tensions that characterised it. To take an example, one of these was the fact that guides at the museum saw their work as ‘performing’ themselves (in what we thought of as quite culturally alienated ways) compared to what they saw as the ‘real’ work of digging coal. So we knew we would need shots capable of suggesting this. We had to think hard about how exactly such knowledge might be conveyed – what visual metaphors, for example, might serve the purpose? This kind of knowledge also had implications for our general approach to camera-work – for our shot list, certainly, and for the kinds of interactions on which we decided to focus (see below). We were in this sense dependent on having already accumulated a fairly sophisticated level of knowledge about
the field, available because a period of analysis and interpretation had already been completed before we switched on the camera.

Hence, because images need to convey ethnographic sense in and of themselves, the visual ethnographer needs a good level of knowledge about the field before picking up the camera. Otherwise, s/he will be second-guessing the subsequent analysis phase. This is why some visual anthropologists insist that a long period of observational fieldwork is necessary before filming begins (for example Asch 1992). This has often been suggested as three months, at a minimum, during which time no filming will take place. In practice, of course, few films are made in this way, due to the high costs of human and technical resources. Instead, filming is often commenced as soon as the fieldwork period begins. As McCarty (1995) observes, many visual ethnographers have considered that, as long as sufficient preliminary time is spent in the field, time enough to get to know people as individuals rather than as distanced figures on the horizon, this need not present a great problem.

**Choice of representational media**

There do seem to be, then, several significant differences in the relative conceptions of fieldwork within the two subdisciplines we have been discussing. In film, seeing the field in terms of ‘data’ has tended to be obscured by the fact that what one shoots is (partly or wholly) constitutive of the finished product. In writing, by contrast, a far clearer division between analysis and representation has been established. Further, in fieldwork for written ethnography, observations can proceed more freely, according to ethnographic, rather than aesthetic or communicational, criteria. That is, data records can concentrate on showing the terms of the field relations themselves, and the ethnographer can focus on the meanings that participants themselves deploy. These meanings can be recorded without undue concern about how the records will communicate to outside audiences. Worries about how best to communicate meanings to audiences are reserved for the separate activity of ‘writing up’.

This focus on the meaning-frames of fieldwork participants, it should be noted, has always been a point of contention in ethnographic methodology. It has often been pointed out that observation is never a neutral blank slate practice, and will often, perhaps should, be informed by prior theory (Glaser and Strauss 1967). In spite of such caveats, though, it is the case that in written modes, the meanings of the field govern, to a greater or lesser degree, the meanings to which the ethnographer will attend. In filmic ethnography, by contrast, it is often difficult to carry out an extended period of observation and analysis before filming takes place. As a result, footage may conform more to the representational agenda of the ethnographer than to the meaning-frames of the field itself.

These differences have been germane to debates over the relative ‘scientific’ status of written versus filmic ethnography. In qualitative research in general, going into the field with an open approach has been seen as an essential basis for establishing the authority of the conclusions drawn. If there is a pre-given agenda or structure, this
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should be generated from the hypotheses and insights of theory, not by the demands of the representational forms to be used. By contrast, in film, the need for structure in camera-work derives from the demands of the representational medium – footage has to communicate in and of itself. Approaching fieldwork with this clear filmic agenda in mind – for example, with the ‘shooting scripts’ often used in the film world – has been seen as potentially compromising the evidential credibility of the footage obtained (Collier and Collier 1986). Accordingly, film ethnographers have tried to re-establish this credibility by carrying out intensive pre-filming fieldwork.

All of the above serves to exemplify two general principles of ethnographic hypermedia. First, it is important to know in advance what weight is to be given to each of three principal media: writing, images and sound. Are they all going to be used equally as means of conveying ethnographic meaning? Or is the EHE going to be weighted towards one medium more than another? Will the EHE resemble more a photographic database, a linked network of video clips with minimal writing, a written hypertext with visual dimensions, or what? In our own work, we wished to grant roughly equal weight to both written and audiovisual media, so this entailed thinking quite carefully about how the two might be successfully integrated.

Tied into this is the question of prior or subsequent analysis. Because hypermedia allows one to give equal weight to all media, there is no ‘natural’ or obvious prioritisation of one over the other. If one follows Tim Asch’s (1992) advice, spending three months in the field with a notebook and only then begin filming, one will have written records that are preliminary in a way that the camera footage is not. This may not be seen as a problem. But where one wants, as in our case, to give equal communicative weight to different media, one is likely to want to pursue several different data-recording methods simultaneously. This is no small endeavour.

Observation through filmic structure

The considerations that we have outlined above have implications for how one approaches camera-work in the field. If little or no interpretation has already taken place, the recorded images are unlikely to make ethnographic sense in the way required. They should arguably only be used as data records for subsequent analysis, rather than representation. Bateson and Mead (1942) were the classic exponents of ‘objective’ and ‘neutral’ camera-work, aimed at assembling databanks of images for subsequent analysis. It is no accident that they produced printed books with still images rather than using their footage to make films. Where film is the end-product, the footage obtained must succeed in reflecting the insights gleaned from prior analysis/interpretation. We therefore find convincing the argument that only through careful, pre-planned structure can ethnographically meaningful visual material be produced through the video camera.

In hypermedia, filmic sequences can play a major role in the authored representation. If film is to be used, this dilemma of structure versus observation will have to be resolved. We suggest that, rather than regarding filmic structure as an evil to be
avoided, having a general picture in one’s mind of how the filmed images will work together as representation and how they will communicate, arguably enhances hypermedia ethnography, and may even be essential to it. From this perspective, pointing the camera is neither scientific nor encyclopaedic. Rather, it is informed by the kind of sense-making structure that one has in mind, which will in turn be informed by the ethnographer’s developing interpretative framework.

**Filming with structure in mind**

We have suggested, then, that if images are to be used as the final representation, filming needs to be carefully structured to make sure the right shots are taken. But this requirement for structure can produce quite an ethnographically problematic result. Shots may be selected according to the structure, rather than according to the ethnographic sense of the field itself. In our own experience, we set out to film already having a fairly clear idea of how the finished product would look. But we were aware that this meant we were approaching filming in quite a different way from our approach to other data records. This problematic of filmic structure brings into play a host of issues and tensions for the hypermedia and visual ethnographer alike. As well as the issue just discussed, of analysis-dependent filming, there is also the issue of obtaining data records that are ‘fit to be seen’ by readers. Using a video-camera in the field can, as we have already suggested, promote an audience-oriented approach to field data – collecting data for their communicative impact rather than purely for their ethnographic significance. It is the fact that hypermedia blurs analysis and representation that is most significant here (i.e. the bringing of ‘backstage’ data and analysis, together with the authored end-product, into the same electronic environment). Because the hypermedia ethnographer knows that the reader can access the data quite freely, s/he is perhaps more likely to go about making data records with this in mind. Knowing that everything will be open to inspection potentially makes the ethnographer preoccupied with readability, becoming overly-conscious about how the data will succeed in speaking for themselves. This is particularly the case with audiovisual recordings.

We found that using a video-camera tended to aestheticise our approach to interviews and interactions, so that considerations about camera angle, shot composition, sound quality, and so forth started to impinge quite noticeably on our interactions with our subjects. Caught on camera, we became concerned with the presentation of self (how we asked questions; how we responded to participants; even how we sat). Similarly, we found ourselves filming the fieldwork environment through a cinematographic logic of what would ‘work’ on camera. Such considerations relate to long-standing dilemmas in visual ethnography about the extent to which the filmmaker, by using a camera, inevitably ‘arranges’ the field as opposed to being a window onto it (see Banks 1992). The well-known ability of the camera to ‘lie’ is one of the reasons why social researchers have long been suspicious of the camera as a principal fieldwork tool. The danger is that one starts to define the field in terms of its viewability, something which will have repercussions for the kind of data one is likely to record.
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Yet it could also be argued that, as long as one is aware of the potential effects that a technology brings, such knowledge can usefully be applied to enhance the research. As with all interactions between ethnographer and fieldwork settings, it is important to reflect on how one’s own research assumptions and agenda shape interpretation. The idea that researchers can simply look through a window onto the world reflects empiricist ideas about ‘neutral’ observation. Against this, we take it as axiomatic that there is no neutral perspective from which the field can be objectively surveyed. From this perspective, cameras are no more intrinsically biased than other forms of technology, such as pens and wordprocessors. Selecting particular shots because they will communicate effectively on screen can go hand-in-hand with collecting shots thoroughly as data for interpretative ends.

Let’s approach this complex question with a simple observation: it is virtually impossible to get people to act ‘naturally’ in front of a camera (Barbash and Taylor 1997). People often feel the need to protect themselves while being filmed; for example, by limiting what they say to uncontroversial or ‘official’ statements. They may find themselves acting ‘for’ or ‘to’ the camera, or deliberately doing ‘camera-ignoring’. Asking people to ‘act naturally’ is to give them the hard task of objectifying themselves – i.e. to perform themselves as recipients of their own distanced gaze. In the classic naturalistic ethnographic film approach, it asks them to illustrate a type simply by being themselves. Flaherty’s famous 1920s film *Nanook of the North*, based on anthropological fieldwork in northern Canada, uses this kind of metonymic structure, whereby one family stands for a whole culture seen from the single vantage point of the ‘objective’ but hidden camera. Numerous scenes were in actual fact directed by Flaherty himself, but this manipulation is never made visible to the viewers. Instead, scenes of Nanook and his family are offered to viewers as a slice of Inuit life, taking place in front of the camera, which the camera simply recorded and reproduced. Flaherty famously commented: ‘Sometimes you have to lie. One often has to distort a thing to catch its true spirit’ (quoted in Weinberger 1994: 6).

Ethnographic filmmakers are now more ready, even eager, to acknowledge that in pointing the camera they are inevitably arranging the life-world into a scene that makes sense both for them and for those who are going to view it (see Chapter 2). What they are not doing, it is increasingly recognised, is transparently capturing ‘real life’ in front of the camera. But this is also the case with fieldnotes and interviews. Written-mode ethnographers acknowledge that these are accounts based upon their own cultural frameworks and values and which are oriented to those of their readers. The ethnographer cannot write him or herself out of the picture. Accordingly, life-world data can never simply be observed and recorded, and in this sense, as we mentioned above, the word data is often rejected in ethnography. Visual ethnographers have experimented with a number of reflexive strategies – such as placing the ethnographer or cameraperson in the frame, or showing different, even conflicting, perspectives on the same event – in order to acknowledge the essential subjectivity of the camera’s perspective.

This means that, in order to make sense, filmic data (just like textual data) are always reworked – through the activity of interpretation-led filming and editing – into larger organising forms. In the case of film, the key organising mode has tended to be narratives.
In written academic texts, it has tended to be classification, regarded as more ‘scientific’. However, as we discussed in Chapter 2, it is now widely recognised in qualitative sociology and ethnography that classificatory schemes are products of the researcher’s cultural world-view, too, and do not exist ‘naturally’ in an a priori way within the data. Accordingly, coding and classifying are themselves produced within a culture that makes sense of itself through narratives and stories. The kinds of classifications we make are inevitably informed by the cultural ‘scripts’ we have in our heads (ideas about the characteristics of mining communities, for example). It has further been pointed out that academic writing itself relies on narratives and various rhetorical devices, and, indeed, is replete with them (Atkinson 1990). Hence, pointing the camera with narratives in mind is no different from doing observation with narratives in mind. Structure allows the hypermedia ethnographer to collect a variety of shots that will work both as data and as representation. For such reasons, we feel that going into the field with a clear filmic structure is crucial.

Case study: Three kinds of video data

In our own research at the Rhondda Heritage Park, we chose three kinds of structure to guide our use of the camera: narrative, interview-based and episodic. We will briefly discuss each in turn.

Narrative oriented camera work

This comprised video data of the museum’s ex-miner-guides as they went about their daily tasks. We began filming from the moment of their arrival at work in the morning and continued through to their departure home at the end of the day. This aspect of the ethnography was designed to allow us to understand the inter-relations of frontstage work (i.e. during visitor tours) and backstage work (outside of the tours) in the daily activities of the guides. Consequently, we wanted to film these crucial changeover points, as well as the different settings within which interactions with various personnel occurred. The narrative structure of ‘A Day in the Life of a Guide’ seemed both appropriate and relatively straightforward for camera novices to tackle. This kind of narrative has its own spatial and temporal itinerary, repeated with each of the three guides we filmed in this part of the ethnography:

- **The car-park**: The guide arriving is filmed in long shot from the museum entrance, gradually approaching the camera.
- **The changing-room**: Close-ups of the guide as he changes into his miners’ costume and ‘blacks up’ at the start of the day, then changes back into ordinary clothes and cleans up at the end of the day.
- **The reception desk**: Close-ups of the guide talking to the receptionist and finding out what visitor parties are booked throughout the day.
- **The colliery-yard**: Mixture of close-ups, pans and long shots of the guide traversing the yard on his way to and from the miners’ room.
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- **The miners’ room**: Close-ups of the guide interacting with the other guides, drinking coffee, eating lunch, and preparing for his next visit.
- **The reconstructed street**: Close-ups and pans of the guide greeting his visitor group and leading them out to begin the tour.
- **Various locations around the museum**: Mixture of shots show the guide performing as a tour-leader (see below).

In all of these different locations, we kept in mind the narrative structure of ‘A Day in the Life’. This involved making sure that we collected enough ‘endings’ and ‘beginnings’ (such as allowing the guide to disappear into the distance or round a corner before switching off); plenty of ‘bridging’ shots (such as the guide crossing the yard, climbing stairs, shaking people’s hands, posing for photographs); and making sure we had material of ‘visual interest’ (e.g. close-ups of guide/visitor conversations; shots of guides’ facial expressions; expressive and symbolic shots of the museum’s built environment). If a visitor was talking animatedly to a guide, we took care to get good close-up shots. If an interesting anecdote was in progress, we concentrated on recording a good soundtrack from beginning to end.

**Interview-based camera-work**
This aspect of our fieldwork comprised ethnographic sit-down interviews with guides in pairs and, separately, with six visitor groups. The interview questions all followed the same general aide-mémoire. Guides’ interviews took place outside, in the pit-yard. Visitors’ interviews took place inside in a conference room. We reluctantly took the decision to keep the camera and interviewer out of shot for most of the interview’s duration: it simply was not possible to fit a whole family plus the interviewer onto a single camera viewfinder. If two cameras (and operators) had been available, we could have alternated between shots of interviewer and interviewees. It was also impossible to manage close-ups of speakers very effectively, since turn-taking in conversation cannot easily be anticipated. Instead, we fixed the camera to a tripod and left it static, leaving the same recording settings for the whole interview. This makes this footage much less visually interesting than the rest. Interviews can garner large amounts of very revealing spoken data; the question is whether there is much to be gained by filming them. In our own view, unless there is significant interest in the intricacies of interview talk and behaviour, such as group dynamics and/or non-verbal communication, the answer to this question is ‘not much’. For the EHE, being able to include images of ‘talking heads’ rather than disembodied voices was a boon, but, it must be admitted, an aesthetic rather than an ethnographically motivated one.

**Episode-oriented camera-work**
In this aspect of our video fieldwork, we filmed each of our six visitor groups as they took part in the guided tours around the museum. In the footage of the ‘Day in the Life of the Guides’, filming focused on the guides and their interaction with visitors.
In videoing the tours over again, this time with visitors’ sense-making processes in mind, we kept the camera as close to the visitor group members as possible. Each of the spectacles that comprise the tour itinerary form distinct episodic locations, joined together by the group’s movement from one to the next. Thus, this footage is very predictable: the same episode is covered at each exhibitionary location. Filmically, we wanted to focus on our visitor groups with plenty of close-ups, shots of their movement from location to location, and shots of interaction among members of the group and with the guide. Ethnographically, the objective was to see how the same aspects of the museum’s exhibitionary canvas elicited different responses from different visitor groups. The episodes filmed were:

1. Meeting the tour guide in the reception area.
2. The chimney stack in the pit-yard: using it as a means of imagining the shaft’s depth.
3. The pit head: issues of safety in winding miners up and down the shaft.
4. The lamp-room: safety issues around gas underground; visitors don their pit helmets.
5. The cage: going underground in a dark, fast-moving (simulated) lift to the pit bottom.
6. Underground spectacles: safety and first aid equipment; pit props and blasting; pit ponies and their stables; air doors and their operation; the coal face and drilling machinery.
7. The dram ride back to the surface: visitors ride in a simulator showing the journey of a coal dram through underground roadways.

In addition, visitors also watch three audiovisual films, which we did not film as we lacked the requisite specialised equipment.

The video data we collected thus invites two levels of analysis. First, repeat filming with different fieldwork participants (guides and visitor groups) resulted in plenty of cross-comparable data (we could see how one guide’s day differed from another; or how one visitor group responded differently to another). In this sense, the filming allowed us to apply a classificatory scheme (e.g. the category of ‘reactions to the experience of being underground’, or ‘interactions between guides and management’). Second, filming with formal structures in mind (albeit ones suggested by the fieldwork settings themselves) meant that we weren’t simply pointing the camera as if it were a neutral means of data collection. Instead, we used the camera as a means of making sense of and giving meaning to the data, by thinking in terms of events, episodes and narratives. Filming the field with narrative structures in mind, thereby giving the data a meaningful shape, helped us to interpret and refine our data at the same time as recording them. The point was to use the camera as a means of conferring meaning, so that shots succeeded in communicating something – rather than simply recording what was happening in front of the lens.
Throughout our video fieldwork period, we found that technical considerations jostled for attention with our ethnographic aims. Hence, we were simultaneously thinking about fieldwork insights, as well as pointing the camera, selecting video settings and checking the audio levels to ensure we got everything we needed 'on tape'. Since much of our footage was filmed in conditions of semi-darkness, for which we needed a video light, frequent equipment adjustment and checking for light and sound levels were necessary. Two ethnographers were, for such reasons, essential. The multiple-tasking involved in this project meant that it would have been difficult to obtain the material required without some (very basic) prior experience of, and training in, the use of cameras and microphones before embarking on the video fieldwork.

(Source: www.cf.ac.uk/socsi/hyper/chap6)

Ethical considerations

Structure is also important in thinking through in advance the kind of relationship one wants to establish with participants who are going to be filmed. This is a question arising out of principles of reflexivity and collaborative work (Chapter 4), and from critiques of the Nanook-style of objectifying camera-work discussed earlier. The central tension in ethnographic film remains; namely, the concept of film as 'raw data' and film as creative 'product' (see Pink 2001). We have already argued that data are never merely 'raw', in the sense of being transparent and mimetic recordings of reality. This is in contrast to the claims of classic ethnographic filmmakers. Margaret Mead, for example, recommended the continuously-running, unmanned (sic) 360-degree camera as a means of gaining objective records of the field (1994 [1975]). However, unmanned cameras can only represent a partial view of the life-world at which they are pointed. Such a recording would not approximate to 'reality' any more than an edited film montage.

The ethnographer's eye is connected to a brain busy in a continuous process of contextualising, evaluating and interpreting sensory data through a repertoire of cultural narratives and knowledge. By contrast, what appears on screen from an unmanned 360-degree camera are observable surfaces, unlikely to communicate the contexts of cultural significance in which they are embedded. If a camera does not move and interact, the resultant footage is flat and – no matter if zooms are employed – distanced. In addition, the central perspective of the lens claims a privileged vantagepoint over the surveyed field, tending to objectify all within it. It is worth noting that unmanned cameras can, however, provide useful evidence of temporal and spatial changes. For example, a camera situated at the same crossroads in a village and filming at regular intervals can show how human traffic ebbs and flows during different phases of the day – even though it would miss vital contexts of cultural significance.

Just as text-based ethnographers have had to be self-critical in thinking through the power relations of ethnographer/subject and acknowledging the power imbalances
that structure the fieldwork encounter, so, too, have visual ethnographers often agonised about the seer/seen relations set up by the camera. The myth of naturalism has been increasingly deconstructed in ethnographic filmmaking, so that the camera is no longer seen as the scientific neutral recording device of Mead and Bateson’s day. Responding to this, some filmmakers have deliberately drawn attention to the constructedness of film by adopting techniques that puncture the illusion of reality on the screen. Putting oneself and the camera in the picture is a common strategy; letting filmed subjects view and revise the emergent footage is another (see Barbash and Taylor 1997).

Clearly, the ways in which one envisages the camera’s role – for example, as all-seeing eye, as partisan participant or as confrontational interrogator – have radical implications for camera-work in-field. Planning a repertoire of camera-moves, angles and shots to reflect these principled positions is a sensible procedure to undertake before filming begins. It is also important to be aware of the conventional grammar of film. Certain kinds of shots are likely to suggest certain meanings; for example, shots from above make the subject look powerless; zoom-ins on the face suggest a high significance for facial expressions; the camera moving in tandem with the subject in close-up conveys greater intimacy than a static or more distant perspective. In this sense, the ethics of camera-work are revealed in the style of shots chosen, and it is easy for the audience to see what attitude has been adopted to the subjects on film:

The way subjects are framed, the shots they’re exposed to, the images their voices are laid over, how long they’re allowed to talk for and what about, the revelation of a camera pan or tilt, whether the style disguises or discloses the filmmaker’s authorial presence – in all these ways an audience pieces together clues about the filmmaker’s intellectual and behavioural point of view (Barbash and Taylor 1997: 50)

Handling the camera’s intrusive power is an indicative consideration. Sticking a camera into a person’s face feels invasive of his/her personal space, and it is easy instinctively to keep one’s distance out of respect for people’s privacy. However, if a close, personal video diary is the goal, such distanced, ‘respectful’ shots will fail to convey much intimate knowledge of the subject. Using the zoom as a substitute for physical closeness is not very effective. There is often no alternative but to get the camera closer to the subject. For this to work well, a good relationship has to be built up between the ethnographer and the subject, such that a mutually acceptable level of intimacy can be established. This goes back to the question of allowing a period of pre-filming participative fieldwork discussed above.

Ethical issues are not just relevant to visual methods, of course. They are likely to impinge to some degree on most ethnographic fieldwork, since a general duty to avoid exploiting or harming participants – such as securing informed consent, ensuring anonymity, providing data protection – underlies all fieldwork relations. In hypermedia ethnography, ethical concerns are all the more likely to arise since data are made much more accessible to readers. Readers may be just one click away from accessing a full interview soundtrack, a biographical profile, a photograph of a person
or a video clip of a scene. Particularly where visual records of research participants are
used, and where these are destined for the World Wide Web, great care has to be taken
to secure informed consent, preferably in written form, for such images to be pub-
lished. There is, for example, a standard consent form published by the British Film
Institute, which is very comprehensive. It may, alternatively, be decided that all sound
and vision data should be anonymised, but this may not be desirable or practicable.
Some of these ethical considerations are ones that will be confronted in the represen-
tational phase, since they deal with questions such as when to cut off speech, what
image to juxtapose with what, and what kind of anonymising procedures, if any, to
carry out. We therefore return to the question of ethics in Chapter 8.

Bringing it all together

We have argued that filming with structure in mind may be a necessary precondition
for effective visual fieldwork, but only where in-depth preliminary analysis has already
been undertaken. For this reason, we would see an ideal hypermedia fieldwork project
taking two stages (a possible concurrent third stage might involve the use of so-called
‘indigenous’ media). These are the stages we are following in our current, second hyper-
media project, building on the insights of our experiences at the heritage museum.

The first stage would be an initial familiarisation process. It would involve a map-
ping of the field based on multimodal observation, utilising largely written records
(particularly fieldnotes) together with photographs and, perhaps, audio-recordings.
The photographs would be used mainly to enhance the fieldnotes, and vice versa.
Audio-recordings could be used at this stage to help in sensitising the ear to the diverse,
recurrent sounds of the research setting. The aim would be to familiarise oneself,
through close multimodal observation, with the relations, meanings and interactions
that characterise the field.

The second stage would build on this accumulating body of ethnographic knowl-
dge. It would comprise a multimedia data recording strategy of: (a) extensive written
fieldnotes; (b) targeted visual methods such as well-selected photographs and carefully-
structured video footage; (c) targeted audio-recordings of staged interviews and focus
groups, but also of naturally-occurring field soundscapes; and (d) collection of docu-
mentary and related evidence (such as relevant publications and media).

An optional third stage, to run concurrently with the second, would be to engage
fieldwork participants in their own activities of multimedia recording. For example,
giving participants cameras to photograph what they see as significant can produce
interesting results (see Chaplin 1994; Pink 2001). Similarly, inviting participants to
draw or map their experiences is a productive way of understanding how they define
what is salient and/or irrelevant; how involved they are versus how detached (see, for
example, Van Leeuwen 2000).

In this way, we suggest that an integrated approach to multimedia fieldwork can be
found. The idea is to try and focus as far as possible on the differing functions of the
particular medium being used at each different stage of the fieldwork (whether as representational material or as ‘raw’ data), while also trying to be as systematic as possible in granting appropriate weight to each one. This hopefully will avoid the situation in which – to a degree – we found ourselves during our first project. In such a situation, the camera can too easily be used as simultaneously an interpretative, recording and representational technology, whereas the status of ‘proper’ data is reserved for written records alone. Against this, ethnography clearly needs to develop the tools for integrating approaches to different kinds of media. It also needs more adequately to theorise the inter-relations among them as both records and remnants of the social world.
Today’s researcher has available a bewildering array of technology to record the social world; unfortunately, equal bewilderment may ensue on perusal of the resultant records. So much is possible (photographs, film, scanned images, graphics, soundscapes, recorded talk – and more) that the researcher who has to make sense of them faces quite a challenge. For a start, you can’t just ‘analyse’ multimedia data records all in one go. Let’s divide the tasks into two broad areas: (1) the practical concerns of handling large amounts of diverse multimedia materials and (2) the techniques required to utilise hypertext as a data analysis aid. Multimedia data records themselves bring both technical and theoretical challenges. The technical issues to do with storage and electronic resources (discussed in Chapter 5) are ever present, even though computing power is always expanding. Theoretical issues regarding multimedia data analysis include how to handle the different media in a consistent and principled manner. Our own experience, emerging from both our previous and current work, suggests that there is no such thing as ‘multimedia analysis’. You simply cannot group all media together and analyse them in one lump. Rather, each medium has first to be analysed and interpreted within its own terms, before being re-integrated into the emergent ethnographic hypermedia environment (EHE). In this respect, many of the issues surrounding multimedia analysis involve trying to (re)integrate practices established in written and visual disciplines.

In what follows, we discuss what a strategy that uses hypertext for both visual and non-visual data analysis might look like. To do so, we first explore hypertextual approaches to the analysis of written (textual) forms, and how this compares to more orthodox techniques – in particular, those utilising computer-assisted qualitative data analysis software (CAQDAS). We then go on to address the challenges faced in visual data analysis, although it remains the case that it is not yet possible to undertake a computer-assisted hypertextual analysis of video data, as the requisite software does not, to our knowledge, exist. Nevertheless, a range of approaches to analysis can be considered, which combine insights from visual ethnography and hypertext.
CAQDAS packages are obviously at the heart of any discussion of computer-assisted analysis of qualitative data, whether visual or text-based. It should be emphasised, however, that CAQDAS can be somewhat misleading, as it tends to imply that the software performs some type of ‘analysis’ upon qualitative data. This is a common misconception and may well bear some responsibility for the perceived distrust of such software among many social scientists (see comments in Lee and Fielding 1991: 8).

It is important to note that CAQDAS programs are not capable of performing qualitative analysis in the same way that statistical programs can perform statistical analyses of quantitative data. Rather, CAQDAS programs are capable of providing automated tools that can help a researcher organise and interrogate the data. Consequently, like Kelle (2000: 283), we see the most viable use for such software as an organisational tool. Our aims here are rather different in that we see hyperlinking as a distinctive strategy – one that can aid the researcher in making sense of the data in potentially innovative ways.

**Analyzing textual data**

Let’s first consider the analysis of written-mode data records. This is a field long-dominated by computer-assisted qualitative data analysis software (CAQDAS). Following Weaver and Atkinson (1994), we do not regard hypertext as a replacement for CAQDAS, nor do we regard hypertext as suitable for all projects. But we do believe it provides an innovative and useful extension to the ethnographer’s toolkit.

The basic rationale for hypertext has long been that it provides a more ‘natural’ way to think about information (Bush 1945). The use of associative links between nodes is claimed to be fundamentally similar to actual human thought processes. Such a claim may be considered contentious (Conklin 1987; Lehto et al. 1995). But the ordering of thoughts and data records is an essential component of any research project, and hypertextual methods allow the data set to be transformed into an electronically navigable and flexible network. In addition, we argue in what follows that hypertextual methods can build upon CAQDAS to deliver a deeper analytic approach.

However, we should make it clear from the outset that hypertext does not in itself constitute a straightforward or obvious analytic strategy. One of the problems posed by hypertextual analysis is that it proceeds by the construction of trails of links through the corpus of data records. This means that there is a danger of forging trails blindly, without having an overarching view of the whole corpus and its thematic contours (Fielding and Lee 1998). We recognise this danger and have encountered it in our own work. We consequently suggest that a preliminary phase of familiarisation with the corpus will undoubtedly be necessary before hypertextual analysis begins, in order to establish basic recurrent thematic topics (see below). This is likely to consist of scanning for broad topical similarities and recurrent thematic patterns in the corpus, and may well take the form of ‘rough’ or ‘open’ coding. But for the progressive refinement of analysis, we see hypertext as a potentially valuable alternative to code-and-retrieve
strategies. Unfortunately, none of the CAQDAS programs currently on the market allows for the more potent hypertextual capabilities that are, in our view, of greatest potential value to the ethnographer.

**Hypertext compared to coding**

There is an extensive literature on code-and-retrieve software and its use in social science research, including our own assessments of its strengths and weaknesses (e.g. Coffey et al. 1996; Dohan and Sanchez-Jankowski 1998; Fielding and Lee 1998; Kelle 1997; Lee and Fielding 1991). This is not the place for yet another contribution. We do, however, wish to give an outline account of the relationship between coding and hypertext mark-up as tools for social researchers. Coding in the general sense can be considered as a method of ‘data reduction’ via indexing. Segments of the data are marked with one or more codes that correspond to the researcher’s emergent interpretation. In this manner, the data are indexed, and turned into a coded data set. These codes can then be investigated at a later date and the findings then used progressively to refine the initial coding structure.

This reformulation of the data into an index or set of codes enables the researcher to operate on a more abstract level and focus on the relationships among different aspects of the corpus. CAQDAS programs facilitate the coding process by providing a wide range of tools that can semi-automate the process, make it easier to manage lists of codes, set up relationships between codes and easily search and retrieve codes or fragments of data that have been indexed with codes. The analytical side of CAQDAS software tends to focus on the ability to run quasi-statistical and logical operations on the *codes themselves* (i.e. the index to the data). If the data set has been adequately coded then the relationships among codes should provide insights into the actual data.

As with any software, CAQDAS programs have had to deal with at least two types of difficulties. Many failings of early CAQDAS programs were due to the hardware available and the relatively primitive nature of what the software could do. As computers have become more powerful, and developers have gained more experience in the creation of CAQDAS programs, the software has, undoubtedly, become more sophisticated and more useful. On a theoretical level, though, CAQDAS software has tended to be dominated by indexical code-and-retrieve approaches (Coffey et al. 1996; Dicks and Mason 1998). As Coffey et al. argued, these are not necessarily the most appropriate technique for every project (though see Kelle 2000). Conversely, the hypertext approach to data analysis works on a cross-referencing system, where text segments are linked together due to there being a specified relationship between them. Kelle’s (1997) riposte to Coffey et al. (1996) suggested that there is in effect little difference between indexing/coding and cross-referencing/hyperlinking. Whether one indexes text-segments or directly links them together produces the same sort of insight. However, our own experience suggests otherwise. As with a coding strategy, hypertext requires repeated readings of the data – but the analysis of the data progresses in a somewhat different manner. While coding links segments of data to user-generated
codes, in a data-to-code model, the hypertext strategy links segments of data to other segments of data, in a data-to-data model (although data can also, of course, be linked to interpretative texts in a data-to-memo model, or even to thematic nodes, mimicking a data-to-code model). The data-to-data model requires a quite different approach to the data, because the major task for the researcher is not in deciding which code to assign to a segment of data but which other segments of data to link with the segment of data currently being considered.

Hyperlinking also involves labelling the nature of the link among segments (something which Kelle’s discussion neglects). This focuses attention on identifying the varied kinds of relations among different segments, rather than purely on relations of similarity. The researcher does not have to identify an overarching code that adequately sums up multiple pieces of text content (which can often be frustrating, as meanings are rarely precisely replicated across a whole corpus). Instead, the researcher examines the nature of the relationship between two or more segments. Over time, these relationships can be grouped together into link-families. A number of distinguishable themes will indeed be amassed, but each will consist of a field of inter-relationships, rather than a series of nested and interwoven codes that try and label each piece of content.

**Hypertext as a form of coding**

That said, we do not deny the undoubted value of indexing/coding for qualitative analysis. Our premise rather is that hypertext is a more general or deep-level system than coding and, consequently, that hypertext can be used to simulate coding but coding cannot be used to simulate hypertext. In a hypothetical coding system, a segment of the data could be indexed with the code ‘foo’. The code ‘foo’ then represents the set of all the segments that have been indexed with ‘foo’. The set of all codes is then created in a master list or ‘family’ of codes. The code family accordingly provides a complex indexing of the data. Coding can, however, also be conducted hypertextually. To do this one creates a node called ‘foo’ (a code-node). One then sets up hypertext links between it and all relevant data segments. A reference to each relevant data segment is then inserted into the code-node ‘foo’ so that bidirectional links exist between it and each linked data segment, functioning to turn ‘foo’ into an index entry. A ‘master code’ list is then created in a new node, called ‘master’, and this new node is then linked to all of the other code-nodes. This allows the creation of a family of code-nodes, similar to a master list of codes in CAQDAS programs.

In this way it is possible to create a hypertext that replicates a coded data set. On the other hand, it is impossible to create a hypertext with a CAQDAS program (one that creates a coded data set) because the whole point of an index is to create links between data and index, not data and data.\(^6\) In this respect, hypertext can be seen as a more general system than coding and, therefore, potentially more flexible. That said we do not recommend using hypertext programs to perform simple code-and-retrieve functions; it is far better to use programs, of which many exist, that are
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designed to do precisely that. Our intent here is simply to demonstrate that coding and hypertext are not necessarily antithetical strategies. Indeed, in our current work, we have used code-nodes in just this way for the initial period of data-familiarisation. They allow a thematic overview to emerge, which lays the intellectual basis for the next stage of data-to-data hyperlinking.

**Hypertext as hypertext**

The main phase of hypertextual analysis consists of linking together data segments, and thereby creating relationships among them. In order for hypertext to be of any use for data analysis, those relationships need to be capable of being manipulated and organised in the same way that codes can be manipulated in a coding program. The standard technique for doing this is to give each link a name and use that name to express the relationships among the linked data elements. The name may be content-based (referring to a particular content theme, such as 'community') or express some semantic or logical relationship between the segments (e.g. segment A could be linked to segment B via a link termed 'contradicts'). As discussed in Chapter 3, this structure allows the creation of semantic webs based on 'triples' (i.e. two entities and a relation). The progressive linking and link-refining via named links is the critical tool which hypertext can provide the researcher to aid in interpretation.

Hypertext as a qualitative data analysis tool encourages the researcher to focus on explicit relationships among elements of the data records. This builds up relationships that cannot easily be constructed in code-and-retrieve programs. In our current project, we have found it useful to assign a multi-part name to each link. One part of the label refers to the thematic relationship, and another to the semantic one. Linking can also be one-way or bidirectional. So, for example, node A may ‘support’ node B, but node B does not have to support node A. In this way, linking can express transitive relationships within the data. Providing that the hypertext program provides the function of link naming, the researcher has considerable flexibility to create both local and global relationships within a hypertext. In a fully implemented hypermedia representational system, any segment of any type of media should be capable of being linked to any other.

Another powerful data analysis aid in hypertext is the ‘path’ (or trail). A path is the set of all links with the same name (see Chapter 3 for a fuller discussion). The ability to inspect paths and browse or search for them is, we contend, the most fundamental requirement of any hypertext program intended for hypertextual data analysis. A path allows for the linking of nodes that are not explicitly linked elsewhere. For example, say two nodes are linked via the link named ‘memorialism’, as are two others elsewhere in the data set. Clearly there is a relation between all four nodes but having to manually link each node to each other node is time consuming and, in large data sets, probably impractical. If a hypertext program has a method to allow the display of paths (as in StorySpace’s ‘path browser’ and ‘road map view’) then the researcher can examine the nodes on the path and decide whether further linking is called for.
Finally, hypertext does not necessarily, though it can, distinguish between node types. Consequently, it is possible to treat the researcher's own comments, interpretation, notes, jottings and so on in the same way to the data upon which it comments and link it accordingly. The ability to link memoranda to data has long been implemented in CAQDAS approaches and is just as easily implemented in hypertext. In fact, hypertext allows the researcher to blur the differentiation between memoranda and data, allowing the researcher to treat their thoughts as data in a reflexive manner, if so wished. In general, we have preferred to adopt an explicit distinction between data record and ethnographer’s voice. We have done so by creating an assemblage of data nodes and interpretative nodes. These are then progressively linked together.

Case study: Linking it all together

As described in Chapter 3, we used StorySpace as the program in which to develop our Ethnographic Hypermedia Environment (EHE). We found this program to be excellent both as an analysis tool (for which it is not marketed or intended) as well as an authoring tool (for which it is). That said, although StorySpace met most of our requirements, as outlined above, it fell short in two ways. First, at the time of our first project, it could not handle multimedia; second, it was not capable of creating link typologies. The program can name links and provide a ‘path browser’ to inspect them, but it cannot produce a typology of relationships among links. Although significant obstacles, these two failings were possible to overcome. In this section we describe how we imported and organised the fieldwork data and how we used StorySpace to ‘storyboard’ the EHE. As usual, we will minimise the technical details and focus on the motivations behind choices.

We use two related strategies in conducting hypertextual data analysis and organisation using StorySpace: reference nodes (for paradigmatic categorisation) and path creation (for syntagmatic linking of data elements and analytic texts into interpretative pathways). This was an evolving strategy and only became formalised after several repeated attempts to find a procedure that we felt would be capable of adapting to fit our needs. As with most exploratory projects, several issues surrounding the handling of data emerged initially from practical considerations alone – only to give us valuable insights into theoretical issues later.

One of the design features of StorySpace, which proved to be very useful, is that it allows nodes to be stored in hierarchical structures. Technically, each node has a ‘writing space’ and is stored in some sort of structural relationship with all the other nodes in the hypertext network. We used this facility to organise the data that we stored in the program into a tree structure. At the top level we had one node, named ‘data’. The writing space for that contained information about the contents. At the next level we initially generated four nodes: old data, new data, reports and ‘misc’. Although there was nothing theoretically informed about this approach, it did provide us with a simple structure in which we could import data. It would also be
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relatively easy for a later reader to navigate. In addition, StorySpace provides various types of graphical display for node structures. This enabled us to keep control of what quickly became a massive amount of information. The figures below show two of the views of the data that we worked with. The 'map' view in Figure 5 pictures nodes as rectangles and links as arrows. Most of the nodes also contain other nodes and these can be seen as rectangles within the main body of each node. The map view was the one we used most frequently. The ‘outline’ view in Figure 6 shows an outline of part of the data node; it can be manipulated to collapse or expand specific parts of the network.

From talking with various hypertext authors as well as the designers of StorySpace, we learned that the map view in StorySpace (and similar tools such as Intermedia’s web view) appears to be the most popular tool for developers. The main advantage of it is that it can be manipulated quite freely, encouraging authors to create graphical metaphors (such as circles, crosses and quilts) for their hypertexts.

One of the major organisational features of the hypertext data came about through necessity: what we termed ‘reference nodes’. The vast majority of our textual data were lengthy and it transpired that StorySpace had a 32K size limit for text nodes. We debated several options, but chose to segment the data into the largest nodes possible to reduce the number of nodes and minimise any decontextualisation of the data. To keep the structure well-defined, we decided to import each piece of data (interview transcript, video log, etc.) into a node (the reference node) and then store its various parts within that node as ‘children nodes’. We then used the writing space in the reference node as a place to store information about the data contained. This is shown in more detail in Figure 7.
The issue of ‘big nodes’ is one that confronted us continually throughout the construction of the hypertext. All previous hypertexts that we had read tended to be ‘fine-grained’ with nodes that generally contained minimal amounts of text. Even scholarly hypertexts (e.g. Greco 1995; Kolb 1994) tended to have nodes with minimal amounts of text. Our data nodes, however, were as massive as the program could cope with and this caused certain techniques not to work as well as hoped. For example a text or keyword search in StorySpace will find the relevant node(s) but will not scroll the node to find the right place. In a small node this is unproblematic because there is little text to inspect. But in a node with over 1,000 lines of text (i.e. most of our textual data nodes) scanning this much data to find the relevant text is largely impossible. In addition, the size of some of the nodes seemed to make the program more likely to crash. Painful trial and error taught us that there were some things we simply could not do. (In our current project, we are facing even more of a problem as we are working with a much larger data set. We found that the program simply could not cope with the large amounts of data we had entered into it. Although we are still using StorySpace, we have been forced to break the entire corpus into two smaller domains and to analyse these in turn before reintegrating them together in HTML once all links are in place. The latest version of the program, currently being prepared for PC release, promises to overcome these memory problems.)

Our first task, once the data records were successfully imported into StorySpace, was simply to read over the data and become familiar with it. As we did so we were able to take advantage of StorySpace’s memo tool to make notes. We also started
to attach keywords to nodes. We had an initial list of keywords that we had derived (mostly from names and places as well as some theoretical keywords) and, as we started to generate new ideas, new keywords were generated. We also worked on the premise that keyword names and link names would be kept identical. This initial familiarisation step is similar to the techniques used in coding-based software and is an important one in the process of getting to know one’s data. Hypertext programs provide a reading environment even before links are created, and encourage the analyst to read the data electronically rather than from a print-out.

Initial link-creation
The initial problem for us was creating links. In order to create a linked pair you need, naturally, two items to link. In the first read-through we frequently came across material that we thought would make a good part of a link before we came across an obvious place to link it to. It was at this time that we realised that we could use the reference node as a destination for links. In a sense the reference node quickly became adapted to work as something akin to an index card for the relevant data. Figure 7 shows part of the reference node for an interview, the underlined text links to the referenced material in the transcript.

As we read through the data, the reference nodes became valuable resources in their own right. What they provided was a quick overview of the thematic content of any one piece of data, such as an interview transcript or a set of fieldnotes.
Creating them is equivalent to the familiarisation phase of any qualitative research project – the phase where the researcher reads and re-reads the data records, noting down broad emergent themes (which may also be given in advance, through theoretical sampling). Although some hypertext theorists such as George Landow may have valorised getting ‘lost in hypertext’ we saw it as more of a problem than an opportunity. Indexing a transcript is a relatively structured task with obvious start and end-points, while linking transcripts to other transcripts is by its nature open-ended. Although in theory this helped capture the richness of the texts, in practice it quickly became daunting.

The main tool we used to overcome this was StorySpace’s ‘Path Browser’. This allows the author to examine the linking structures in a hypertext. In our version of StorySpace it was viewable as a margin area within a node’s writing space. By opening the path browser for any node the reader can inspect all the link-paths that the node lies on. By using the path browser as we created links we were able to check for other relevant link possibilities. Consequently, as the number of links in the document increased it became, perhaps surprisingly, easier to create new links. Figure 8 shows the writing space of a data node in the EHE with path browser open on the left-hand side. The small window to the top left shows the name of one of the paths intersecting the node (*community) and the list of node names below it shows the other nodes on that path – blanked out in this case as they contain interviewee names.
Although the path browser proved to be an extremely useful tool, there were two major problems with it. First, we discovered that although the path browser could take us to the relevant node it could not perform text links. For most hypertexts this is not an issue but for us and our 'big nodes' it was a major problem. Some of the transcripts were so long that just selecting a node from the path browser did not enable us to easily find the linked text within the node. As there was no programming solution available from the program's developers we adapted the reference node to work as an intermediary. Because every data link had already gone to the relevant reference node, whenever we were following a path we could go to the reference node and then follow the text link directly to the relevant segment of the data.

The second problem with the path browser was that it could not be accessed independently. Many times we wanted to examine the list of all of the various path names but StorySpace had no mechanics to do that. The only way to look at path names was to open a node or use the 'roadmap' function and then see what paths it intersected. To solve this issue we created a 'Data Path Index Node' which was simply a node with a link to every data path included along with the path names. Figure 9 shows a part of the node.

Through the use of these various means we were able gradually to link the data together. Although many of our approaches were responses to things that we either could or could not do with the relevant software, the issues arising helped inform our understanding of the more general issues to do with hypertextual qualitative data analysis. For example, we quickly realised that we wanted to differentiate between links that were generated as part of our data analysis and later links that...
might take a reader on an ‘authored tour’. As the program did not have any form of link typing we ended up using visual representations: data links were prefaced with an asterix (e.g. "memorialism"), while tours had dashes prefixing and suffixing them (-identity-). Thankfully StorySpace provided a path name change facility that made our experiments much easier to manage. This was a specific solution to what we came to recognise as a general issue with hypertextual qualitative data analysis.

Our eventual method was to repeatedly pass through the data and link, re-link and refine the links. As we did so we used link names to create paths and the path browser to help us refine our understanding of what we were uncovering. Whether this is more or less efficient than using a coding system is hard to quantify but as researchers who have used a variety of systems we can say that it gave us a somewhat different perspective on our data. Although it might seem a rather intangible result, we found that we started to think of our data records on their own terms rather than as a set of topics and concerns. We could examine the links to each node and discover that some nodes were more heavily linked or tended to link more frequently to certain other nodes. Also we discovered that certain links tended to co-occur. By investigating our linking we found emergent relationships within our work that we had not pre-planned. We could then use these discoveries to refine our linking in an iterative process.

The major difficulty of the hypertextual approach, presently, is the lack of off-the-shelf software. The burden of interpretation in hypertext lies in the linking but no currently available software allows the analysis of hypertext links. In comparison, CAQDAS programs specialise in running logical enquiries about the coding structure of the marked-up data. There is no such software that can interrogate link structures in a comparable way. If the hypertext strategy is to be developed, procedures for doing this and programs that can perform those procedures need to be created. This requires both theoretical analyses of hypertext links as well as practical implementations of those analyses. If such software is created it could be put to a wide range of uses. Although we have focused on the handling of ethnographic data here, it could also be used to aid in, for example, the creation of ‘mind maps’ for semiological approaches to image analysis (Penn 2000), or television shows (Rose 2000). It also has obvious potential for research in online settings which may well feature already hypertextual material as well as the analysis of pre-existing hypertexts (e.g. Web-based studies). A good hypermedia authoring and analysis program has the potential to be a ‘killer app’, i.e. a software package that defines the field (Dohan and Sanchez-Jankowski 1998). Alongside any attempt to create such a program it is necessary to derive a methodology of and understanding of the implications of theory building and data organisation in hypertext. This is no small task.

(Source: www.cf.ac.uk/socsi/hyper/chap6)

Principles and suggestions for hypermedia software

Evaluating, choosing and then learning the appropriate software for hypermedia authoring will be time demanding. The potential for integrated, single-platform hypermedia

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ethnographic development is still unrealised. We found it useful to think in terms of a three-step, post-fieldwork process: data analysis, ethnographic ‘storyboarding’ and hypermedia production. Our approach was to use StorySpace for data analysis and to storyboard the final EHE. When we were sure of the structure (of links, nodes and paths), we replicated it in Authorware. Meanwhile, video and image editing were conducted in separate programs. When all the components were ready they could be imported into the final Authorware presentation. (In our current project, by contrast, we are experimenting with a Web-based presentational platform, constructed through importing two StorySpace hypertexts into HTML and integrating them together.)

If using hypertext during data analysis then, at the very least, any software chosen will have to be able to perform the functions we listed for StorySpace above. Based on our own experiences, we have derived a hypertext-for-data-analysis ‘wish list’. In our view, an adequate hypertextual data-analysis program should be able to:

- Implement ‘text’ as well as ‘basic’ linking.
- Support link ‘naming’ in order to express relationships between data elements.
- Create link typologies so that link families can be created and relationships between links can be analysed.
- Assign keywords to nodes and/or links.
- Support the creation of node structures (such as families, as a way of showing non-hypertext relationships between nodes).
- Search for text and keywords, although it would be inconceivable that a computer program would not be able to implement text searches.
- Provide graphical representations of part or all of the hypertext network.
- Provide good navigation tools (e.g. ‘back arrows’, history lists, bookmarks).
- Provide hypermedia functionality (i.e. the ability to link between different media elements).

Analysing visual data

We now turn to the question of analysing visual materials. As already noted in Chapter 6, the two kinds of analysis (visual and written) still occupy quite distinct disciplinary fields. As Van Leeuwen observes in relation to the analysis of writing versus pictures, ‘different disciplines, different terminologies, different methodologies, different criteria of relevance grew up for each: linguistics for language, art history for pictures’ (2000: 276). And a number of different disciplines, we might add, for the moving image. The challenge is to try and integrate them together. It is noteworthy that while methods books discussing a range of media are increasingly available (e.g. Bauer and Gaskell 2000), little work has been done on the integration of different media within one project. Our own experience suggests that data records in different media will need to be analysed separately before they can be integrated together. This is because each medium, particularly the written versus the visual, has particular characteristics and affordances that need to be examined within their own terms.
Whether in hypermedia mode or conventional mode, ethnographic visual data take two principal forms: visual material already in existence and visual data initiated by the ethnographer (see Chapter 6). We will not discuss the former here, which include films, videos, photographs, paintings, drawings, maps and graphics. Analysing them is different from analysing visual materials produced by the fieldworker (although there are cross-overs). It involves examining how a finished representational product, intended for an audience, defines and makes meaningful its subject-matter. This requires the skills of analysis familiar to students of visual media, on which a number of books and articles can be consulted (e.g. Rose 2001).

Visual data initiated by the ethnographer result from the camera being used in the field as a means of recording insights and investigating perspectives. Outside of the specialist fields of visual ethnography, visual sociology and visual anthropology, relatively few qualitative researchers and ethnographers have used video cameras as their principal means of data collection (although this is likely to change quite rapidly as new digital technologies become increasingly widespread). As a result, there has been little discussion to date of the complex issues involved in analysing video field data (Pink 2001). A clutch of books in the social sciences has recently emerged discussing techniques of visual and multimedia analysis, but most of these are concerned with the analysis of existing video, photography and film intended for public exhibition (see above). Analysis of unedited raw footage and stills collected as data about real-life settings is still a largely uncharted field in sociological qualitative methodology (though see Nastasi 1999).

In anthropology, on the other hand, theorising visual representation in fieldwork settings has long been a major theme, due to the important place in the discipline occupied by photography (see Chapter 4). Discussions of methods for visual analysis tend to date from several decades ago, however. This is no doubt due to the aftershocks of the ‘discursive turn’ (see Chapter 2). Many of the early anthropological interventions on methods for treating film as data records were firmly entrenched in the realist, even positivist, tradition. This saw images as amenable to systematic, content-based analysis (on photographs, see Collier and Collier 1986; on the subdiscipline of kinesics and proxemics, see Hall 1974; and on videotape and anthropology, see Schaeffer 1995 [1974]). In this tradition, what is being analysed is not the visual record itself, with all its necessary representational complexities, but the behaviours it portrays. The visual record is treated as a scientifically objective piece of evidence. The extent to which such a perspective has lost ground in current anthropology is notable. For example, in Banks’ recent text Visual Methods in Social Research (2001), the word ‘analysis’ does not even appear in the index. By contrast, Pink (2001) devotes a whole chapter to visual analysis. However, she defines it as a ‘reflexive’ project, quite different from the earlier work. What she does not do is set out a concrete procedure for how analysis might actually proceed.

What is at issue here is the long-running theoretical tension over how to assess the ontological status of images – i.e. are they constructions of reality or objective evidence of it? In Collier and Collier’s approach, photographic images are capable of
yielding systematic evidence. In Banks’ and Pink’s own work, by contrast, the image is seen as a complex social and cultural construction which cannot be approached as a scientific datum. Further, Collier and Collier see images as subordinate to the written word, which alone has the authority to interpret their significance and to convey this to readers. In the later work, images are approached more semiotically, as a mode of signification in their own right. Adopting a reflexive approach to visual analysis also means transferring attention to their social uses. Pink recommends that, rather than classifying their content, ‘it is more useful to examine how people’s uses and definitions of the visible content and form of photographs or video sequences attach them to particular ideologies, worldviews, histories and identities’ (2001: 100). Her discussion does allow for what she calls a realist treatment of images, but this is not seen as the ability for images to give us the truth. Instead, we should concentrate on how ‘the content of visual images is the result of the specific context of their production and on the diversity of ways that [they] are interpreted’ (2001: 114).

Such a perspective, while convincing in itself, presents the analyst of video footage with rather a daunting prospect. Not only is her task that of classifying contents, but also the identification of contexts of production and reception. Pink (2001: 109) recognises that in a video-based project this would probably require the production of ‘a complex web of cross-referenced themes and images which may well be infeasible to construct. When the objective is to use cameras to elicit informants’ views and record aspects of the field, it is hardly at the forefront of one’s mind during analysis to interrogate continually the conditions under which one has created and, indeed, is reading the resultant footage. It seems clear that even the most reflexive ethnographer still wants to use the records she has amassed to aid in the documentation of social realities, however complexly defined. Hence, one has to adopt a kind of double vision – seeing the visual records both as ‘reality’ and as ‘representation’.

The latter means thinking quite rigorously about the partiality of the medium one is using: which aspects of culture does the camera privilege and which does it neglect? What points of view or cultural inferences are suggested by the actions, perspectives and in/visibility of ourselves as the ethnographer/camera operator? How do our technical choices such as camera angle, close-ups, lighting and shot composition work to ‘prefer’ certain meanings over others? If we are to ask such questions of our own camera-work, however, we also need the confidence to treat it as a window on the world. Otherwise, what we are focusing on are simply the nuances of our own representational practices. In the same way, asking questions of one’s observational field notes and interpretations is necessary for acknowledging reflexivity, but at some point we need to settle on their ethnographic value: what – if anything – can they tell us about the world we are seeking to understand?

It is certainly correct to insist that, as images have no single meanings and can never be complete or transparent records of social reality, then analysis has to address the various social contexts in which images are created and their meanings assimilated. It also has to consider the range of different meanings that can be ascribed to the same images by different readers, themselves positioned within different social contexts.
Hypermedia Data Analysis

Hypermedia can well assist with such a complex and multidimensional form of analysis for it enables the representation and storage of intricate webs of information and interpretation. However, we suggest that hypermedia ethnographers will still want to analyse as systematically as possible, on their own terms, the various data records they have made. This involves thinking through techniques of qualitative content analysis, which is the subject to which we now turn. Our discussion here focuses on video, as this was the principal visual media we used in our first project.

**Analysing video footage**

The analysis of video footage is a more challenging and complex endeavour than the analysis of photographs. Our own work suggests there are five steps to follow: logging the time code; storing and capturing the footage; transcribing video footage; analysing video footage; and coding video footage.

**Logging the time code**

Logging the video footage obtained is an essential first step in the process of (a) getting to know what you have filmed and (b) beginning the task of interpreting the data. Video can be played back directly through the camera viewfinder, though it makes more sense to connect up the camera to the computer and view it on the computer screen. This depends, of course, on having a digital video camera with the requisite lines out (see Chapter 5). Video logging can be done manually or with the aid of dedicated computer software. Either way, it involves identifying significant segments through the video timecode (e.g. 10:11–11:26) and attaching descriptive text to these (using a wordprocessor where available). Chapter 5 discussed the various kinds of software that can assist in this process.

**Storing and capturing the footage**

A typical project may have many hours – perhaps twenty or thirty – of recorded video. Decisions need to be made about whether to capture (i.e. save to computer disc) the entire video corpus, or to economise on disc storage space and only capture those sequences that contain the most relevant material. Alternatively, all the footage can be saved onto DVD if a DVD-writer is available on the research computer. The selecting out of film data for digital capture has to balance three aspects: the desire to exploit the full range of video data available, the equal need to ensure ‘viewability’ and ethnographic sense-making, and the humdrum fact that computer storage capacity for video is always going to be limited.

**Transcribing video footage**

The activity of video transcribing is potentially the most laborious aspect of a hypermedia project. It can range in scale, however, from a simple audio description with brief descriptions of the visual action, to a fully-fledged double transcription of both audio track and the visual events on-screen. The latter is a daunting prospect indeed.
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Where it is judged absolutely necessary, the possibility of transcribing only selected sections of the footage can, however, be considered. Transcription will not always be necessary, in any case – particularly if the soundtrack is not of major analytic import. The researcher can proceed directly to indexing the video footage on-screen, or to other methods of analysis. For a discussion of transcription issues, see Nastasi (1999).

**Analysing video footage**

The big question that confronts hypermedia ethnographers is the extent to which video footage should be intensively analysed in the same way as written texts. If one plans to hyperlink (or, for that matter, to code) fieldnotes and interview transcripts in order to generate insights, one also has to consider doing the same with video footage. On the face of it, there seems little justification to treat data differently simply because of the medium in which they appear. However, hyperlinking video footage is not currently a feasible option, due to the lack of dedicated software. Instead, coding up video in the same way as text could be implemented. We shall discuss the coding of video below, but we should also note that coding is not necessarily the most appropriate strategy for the moving image.

Clearly, the video logging described above goes some way in helping the researcher to generate broad themes from video data. However, it is very difficult to manage finely-tuned coding of large amounts of video footage, for there is potentially so much information to be inspected in every frame. In addition to the information one has when using audio-recording alone – such as what is said by whom and tone-of-voice – video allows the inspection of non-verbal communication such as posture, gestures and expressions, as well as the entire in-shot visual environment. The latter may be quite crowded with information in busy social settings such as schools, hospitals, villages and museums. Spatial features such as topography and movement, etc. will be very time-consuming to examine. Consequently, the question of how to analyse video data is still a particularly difficult and underdeveloped area in qualitative methodology.

**Coding video footage**

The point of coding a printed transcript is to categorise the data into related chunks that can then be analysed together (through decontextualisation and recontextualisation, or cut-and-paste) – the process with which CAQDAS programs assist so effectively. In visual ethnography at today’s storage capacities on DVD, it is now possible to manipulate digital video data in a similar way, since computer memory can now store many hours of video footage. Accordingly, one might identify an initial generic level of themes arising from the video data, capture (i.e. save to the hard disc) segments that express these themes, and then move on to finer-grained analysis based upon these captured segments. One could, alternatively, capture the entire video corpus to computer disc given the requisite storage space.

In order to effect a finely-tuned level of analysis of captured video, some means of labelling and categorising video segments is needed. This can be done manually, or it can be done through various kinds of software that are beginning to appear. The ability...
to label, annotate and then group together segments of footage, and to search for those that are thematically inter-linked, is the basic function that video analysis software needs to provide. In qualitative research, various analysis programs now have video capabilities. Of the two main CAQDAS programs that can handle multimedia qualitative data analysis, ATLAS.ti and Nvivo, the former comes closest to allowing video to be handled in the same way as written text. While Nvivo allows video segments to be played, these segments have to be created and labelled elsewhere (for example, in a dedicated editing program such as Adobe Premiere). In ATLAS.ti, on the other hand, files in AVI format can be imported, cut into shorter sequences within the program, labelled, and then linked to texts of any kind (for example, annotations, other video sequences, sound clips, graphics, and so on). This means that video footage and soundtracks can be as intensively coded as written text (always providing the requisite computer disc storage space is available).74

There are also qualitative programs that exclusively handle video analysis rather than textual analysis. In the field of linguistics and the analysis of non-verbal communication, for example, there are now a number of video annotation packages, such as Qualitative Media Analyser (CVS Information System) and Anvil. The latter is a piece of freeware, discussed by Loehr and Harper (2003). On screen it shows a musical-score layout for both video timelines and sound waveforms (like Adobe Premiere), aligned with a video screen. Annotation and comment windows allow for the insertion of codes and memos. A search function allows one to jump to required sections of the video. Such a program allows a detailed analysis of various aspects of any video sequence (such as gesture, intonation, transcription, etc.). As such, it is aimed at a considerably more detailed and technical description of video and sound events than is normally needed by ethnographers.

In our current work, we are using a simpler, CAQDAS-oriented freeware program named Transana.75 Originally designed as part of a PhD project, it has been turned over to the University of Wisconsin which is now in the process of creating an open source version. Transana, too, allows one to tie together text, audio and video so that it is possible to click on a ‘transcript’ (the program’s term for a textual document that you have attached to a particular point in the footage) and play the relevant section of the transcript into the appropriate recording. Then it is possible to select a section of the transcript that has been time-coded and play the appropriate audio or video. For researchers interested in studying the visual detail of recordings this is a major advantage.

The program can be used for several different purposes. First, it is a useful transcription tool. Providing you can upload video and audio files onto your computer then it is possible to play the recording in Transana at the same time as transcribing it. This can enable the user to create either full transcripts, indices or content logs for video. Transana can also import multiple recordings into the same work project, which means that a researcher can, potentially, handle all of their audiovisual material in the same program and easily move between recordings. The program is also able to export
the transcripts in rich text format, which means that they can then be read by standard wordprocessing programs such as WordPerfect or Microsoft Word. Finally, Transana ventures into providing some analysis aides through use of time codes. It is possible to copy-and-paste a selected part of a time-coded transcript into a ‘collection’, to create a clip that ties together an excerpt of the appropriate recording with the copied text. Researchers can then create collections of clips. These clips and collections of clips can then be assigned keywords that can also be searched using simple Boolean searches. In this way it is possible to index and interrogate an entire visual data collection.

We have found Transana to be simple to use but a very effective analysis tool. The sample screenshot (with some anonymisation) in Figure 10 shows the various Transana windows we currently have open while working on our present project. On the left is a video content log and above it is a representation of the waveform of the video. In the top right is a blanked video window and below that a section of the database showing some of the media.

There are various ways in which Transana could be used in a research project. When it comes to hypermedia ethnography we have found it useful in three areas. As a simple transcription device it worked perfectly well. In addition, we found that we were able to use it as a very effective audio-video content management tool. One particular advantage of it was that because it inherently tied together text and audiovisual material we
were able to use it to work across media. Finally, by creating collections of clips, key-wording them and then searching our clip collections we could gather together material pertinent to our thematic analyses. Transana is not, however, a hypermedia program. There is no way to link sections of video to each other or perform any hyperlinking. That said, it is a useful tool that can be used in the creation of hypermedia.

However, the question of whether conventional coding is at all appropriate for video analysis has to be considered carefully. In our initial project, we had video data of two kinds: video of sit-down interviews, and video of social actors engaged in ‘natural’ action. While the former can be treated in a similar way to conventional interview transcripts, with the added level of meaning that non-verbal communication conveys, natural action cannot easily be reduced to a finite number of categories. In our view, it is not really appropriate to treat video data as analogous to interview transcripts. Coding thereby becomes somewhat redundant. Instead, the researcher will need to adopt a more flexible and interpretative approach to the data, which does not try to break it down into categories based on the same procedures as for textual analysis.

Our approach to video data analysis was necessarily constrained by the available computer equipment and the available software. Because there was no appropriate software program that would enable us to undertake hypermedia data analysis we were forced back into first principles. At the same time, because we did not have the capacity to store large amounts of video data we would not have been able to take much advantage of the software even if there had been some. Consequently our first task was to simply log all the video data. This we achieved by the simple expedient of hooking up the camcorder to the computer and playing the digital tapes directly to the screen through our video editing program, Adobe Premiere. We then produced simple text files with a detailed breakdown of the tape contents. We then went back over these logs and used them to guide our choices about which segments to capture. We would then copy the captured material on to a CD and continue until we had constructed a CD library of video clips. From these video clips we were able to create short segments as well as longer montages for the EHE.76

In many ways this process can be seen as representing the initial steps in a hypermedia data analysis process. We had isolated important sections and flagged them as data segments for future linking (or coding). In a fully realised approach we would integrate this with a system of turning video segments into hypermedia nodes. The issues arising from this approach will be examined in more depth in the next chapter. At present there is no completely suitable program to implement this, though it would be possible to use ATLAS.ti to create viewable hypertext networks out of video data and then import the structure into a program such as Director or re-create the structure in a Web page.

In our current project, we are finding that coding video footage has only limited uses. It tends to fragment video into discrete meaning-blocks corresponding to themes. This may be appropriate for video-recorded interviews and focus groups, where there is a clear thematic structure and focus. But, when it comes to footage of naturally-occurring action, we have been sensitised to the critical narrative dimensions of the footage. In this case, the reduction of footage to codes and indexes seems inappropriate – or at least only
useful for familiarisation purposes. In adopting a narrative rather than a thematic video approach, we are experimenting with creating edited ‘descriptive sequences’ of significant ethnographic events. These condense footage down into viewable sequences pertaining to the ethnographically-significant events in which we are interested. Selected segments of these will later be hyperlinked into the rest of the EHE.

Once video data have been perused and analysed, the hypermedia ethnographer is faced with the task of deciding how to use them in the EHE. As noted above, footage can be left ‘raw’, divided into sequences ‘as shot’ or edited into montages. If a digital environment is being used, then editing can be done on the computer, using one of the video editing programs such as Adobe Premiere. Photographs can be edited with a similar package, such as Adobe PhotoShop. Sound, too, can be separately edited using software such as Sound Forge. Professional editing studios will be equipped with entire digital editing suites such as Avid. These facilities may be hired, but are out of the price range of most researchers. Chapter 5 discusses the technical issues of video editing software in greater detail. There are many issues involved in constructing montages and sequences. These are covered in the next chapter, which deals with matters relating to representation. It is in the next chapter, too, that we consider how to bring together the analysis of visual and written materials into an authored ethnographic hypermedia environment.
Hypermedia Representation

There has undoubtedly been a good deal of ‘hype’ about hypertext, not least in claims that it potentially engenders a new ‘open’ mode of writing. This ‘open’ mode is often contrasted to that of the printed book, with its leaves bound in a set order between two covers. In challenging the book’s monopoly on published writing, it is argued that centuries-old writing conventions, dictated by the book’s fixed physical sequence of pagination, are being rendered increasingly redundant or outmoded (Bolter 1999; Snyder 1998). Such claims will be explored further in what follows.

The technical parameters of the book-form have also shaped the classical rhetorical conventions of ethnographic writing (Atkinson 1990). Some ethnographers and qualitative researchers, accordingly, are now rethinking the art of ethnographic writing for the digital and hypermedia age. In writing for and within what Bolter (1999) calls the topographical writing space of the computer, it is certainly apparent that long-established writing styles can no longer be taken for granted. This chapter particularly discusses these implications of hypertext and hypermedia for the representation of ethnographic interpretation – not only in terms of ethnographic writing per se, but also through the interlinking of diverse digital media on the computer screen. In order to begin this task it is perhaps helpful to reiterate four general observations about the potential differences between conventional ethnographic authoring and the authoring of an ethnographic hypermedia environment (EHE).

1. The division of labour between the analysis and representational stages of research is blurred in hypermedia ethnography – meaning that the activity of ‘writing up’ becomes increasingly interwoven with that of analysis. Data records can be hyperlinked to and with authored interpretative texts in an evolving network of interconnections between analysis, representation and data.

2. The electronic ‘hyperlinked’ computer screen does not naturally lend itself to the construction of a single rhetorical sequential narrative. Instead, the reader’s experience is likely to be that of exploring alternative interpretations and pathways, some (but not all) of which will be marked out by the author.
Hypermedia authors are not confined to ‘lettered’ representation, or even to verbal language (or ‘verbiage’ – see Macken-Horarik 2004). The capacity to incorporate still and moving images, as well as sound, means that the burden of meaning is no longer carried by written words alone. As a result, new ways of integrating this diversity of signs need to be found that have much to do with practices of design.

An ethnographic hypermedia environment is not finished when the author has finished preparing it. Because the medium is electronic and evolving, readers can annotate and comment, contributing directly to the ‘text’. In addition, the ethnographic hypermedia environment can be linked to and with other electronic texts, foregrounding its connections outwards and undermining any idea of fixed content boundaries.

These represent some of the implicit tendencies of the hypermedia form, and do not comprise a set of rules. Some hypermedia ethnographers may choose to keep as close as possible to the traditional scholarly text; others will wish to chart new kinds of representation. And different ethnographic hypermedia environments will be situated at different points along this open/closed axis. Nevertheless, the ethnographic hypermedia author will, to an extent, have to rethink the art of academic writing in ways that are appropriate to electronic media (see Kress 2003). In particular, s/he has to consider carefully how, why and where to utilise conventions from print-based forms (Dicks and Mason 2003). Instead of automatically importing rhetorical styles and conventions of argumentation from print-media, the hypermedia environment forces us to question how appropriate these conventions are. For instance, print-mediated academic writing conventionally depends on assembling a coherent and structured argument that proceeds step-by-step towards a conclusion. A major concern in hypermedia is to weigh up the need for step-by-step sequentiality, both within and between different media. This chapter will examine this question in depth, for it goes to the heart of whether hypermedia can be a suitable means of communicating ethnographic knowledge.

Book versus hypertext

In celebrationist arguments on the implications of electronic writing, hypertext is held to present ‘natural’ affinities with the operations of the human mind (e.g. Bush 1945; Nelson 1981, 1991). Moreover, in postmodernist literary theory, hypertext is claimed to offer an embodiment of poststructuralist principles (Landow 1997; Moulthrop 1993). George Landow, in particular, has been a particularly strong advocate of hypertext on the basis that it replicates two key tenets of literary theory: Derrida’s theory of the decentred text, and Barthes’ concept of the ‘writerly’ text (Landow 1992: 33–4). Whether one accepts these affinities as either extant or desirable, it is certainly the case that writing for the computer brings new kinds of literacy to the fore (Kress 2003). Bolter (1999: 300), for example, has characterised hypertext as a new topographical ‘writing space’ in which writing becomes ‘writing with places, with spatially realised
topics’. In allowing the writer to keep track of both associative as well as hierarchical links between topics, electronic writing is naturally organised into both tree and network structures. The book, by contrast, superimposes onto its contents the single dominant tree-structure of its chapters and pagination. As a consequence, Bolter sees the computer as offering a revolutionary writing space which ‘permits every form of reading and writing from the most passive to the most active’ and where ‘no single definition [of cultural literacy] can triumph at the expense of all others’ (1990: 238).

Others, however, have greeted the advent of electronic writing with dismay, seeing in it a radical impoverishment of the reading/writing experience (see for example Birkerts 1994; Steiner 1989). Such arguments lament what they see as the threatened demise of the book, and the reduction of reading to mere information retrieval and data processing. Other sceptics (e.g. McHoul and Roe 1996) have claimed that hypertext celebrants base their arguments on a caricature of the printed text as static, fixed, linear and bounded. In fact, they argue, conventional reading does not proceed linearly. We do not automatically read by adding informational bytes to a linear chain of thoughts; rather we contextualise, infer, move continuously between the big picture and the detail, and gradually build up a picture of the text’s overall meaning. The linearity is contained in the physical materiality of the book form alone; not in the ways in which the human brain interprets what it reads. In addition, McHoul and Roe argue that the metaphors used in hypertext writing simply serve to import conventions from print-based writing, to superimpose these onto hypertext technology, and to misrecognise the results as constituting a radical new form of representation:

These metaphors – browsing, indexing, searching, maps, filters, tours, navigation, etc. – constitute a conventional conceptual reading apparatus. While the implied function of this apparatus can be read as a bridge or transition between ‘old’ and ‘new’ modes of reading practice … it appears more as the overlaying of conventional reading practice on new technology. The technology may be new, but the approach to it and the relations to it are wholly conventional. (McHoul and Roe 1996: not paginated)

Such a dismissal of hypertext’s novelty could be perceived as rather over-simplistic. While there are indeed many overlaps between ‘conventional’ writing and hypertext, the latter does present a number of challenges to the accepted procedures and craft of academic writing, some of which are discussed later in this chapter. Although much of this sceptical body of work is open to the charge of romanticising a golden age of print, it does force us to consider what we may lose by doing our authoring in hypertext and hypermedia. When ethnographers consider whether hypertextual writing might be appropriate for their own work, they are inevitably going to need to consider the implications of such debates.

**Ethnographic hypertextual writing**

Ethnography has been slow to experiment with new electronic kinds of representation. In Chapter 7, we discussed how hypertext principles have, to a limited extent,
been incorporated into one or two of the latest computer-aided qualitative data analysis software packages. This suggests that the value of hypertext for qualitative analysis is beginning to be recognised. It remains the case, however, that once analysis is complete and ‘writing up’ commences, the traditional ‘uni-linear’ printed text usually takes over. It is still largely taken for granted that, whereas both fiction and non-fiction hypertexts can be published in that form, academic hypertexts are translated into standard print research reports. Maris Boyd Gillette, for example, used the hypertext software program *StorySpace* for her anthropological research in Northwest China (Xian), as an aid for the creation of ethnographic field notes. She described her writing process thus:

For my work, the main advantage of this system comes when I wish to write a report. When I have enough data to provide a fairly complete description of a particular topic or event, I use the *StorySpace* ‘gather’ feature and the ‘path builder’ to collect all the writing spaces which pertain to that topic. … After I have collected all my data on the relevant topic, I can read and sort it, discard what is irrelevant, export my data to my word processing program, reorganise it in a logical sequence, fix the prose, and analyse the material. After I have finished these tasks, I have a completed report on a topic, which will become the basis for chapters of my dissertation. (2001: not paginated)

In this case, regardless of the uses of hypertext for analysis and interpretation, the hypertextual work is largely discarded when it comes to presenting the work. There are a number of potential reasons for this – not least the powerful expectations (of structure, logical argumentation, sequential exegesis, and so forth) that are built into academic writing styles. Our own experience, however, suggests that ethnographic representation can be successfully and interestingly reworked in hypermedia form on the computer screen. Nevertheless, we are not claiming that nothing changes in the process. In fact, writing in hypermedia mode does present some considerable departures from writing in book-form. In particular, the hypermedia model allows a number of interpretative sequences to be created for the reader to follow. These do not have to start and end at fixed points, but can assume a variety of structures (such as cyclical structures or maps). For this reason, although hypertext has famously been characterised as a non-sequential, non-linear mode of writing (Nelson 1981), we want to re-emphasise that the term ‘multi-linear’ is perhaps more appropriate. Hypertext allows, as Bolter (1999) observes, for a number of ‘paths’ or ‘trails’ to interweave without the necessity of singling out one as the defining argument. This echoes some of the concerns underpinning current post-paradigm debates within ethnographic representation (see Chapter 2).

The conventional book form has given academic writing (or accommodated its need for?) a preoccupation with constructing an overarching, coherent, linear argument. Multiple arguments can be tracked, of course, in any book. But the material form of the book itself always points to a ‘canonical’ structure that dictates the *outline* of chapters, sections and pages. This requirement of academic writing – that the author selects an overarching, organising, step-by-step exposition to structure the book – is one
of the features that has long marked out book-form ethnography from ethnographic film. Film is far less amenable to the traditional hierarchical outline of academic writing. Indeed, some of the fiercest debates within visual ethnography have centred on whether, in its absence, film can legitimately lay claim to the status of scientific text (see Chapter 4). Grimshaw (2001), for example, sees ethnographic film as very different in intention and import from the scientific thesis. Indeed, she sees films that attempt to present a single thesis as ethnographically flawed – failing to make use of film’s inherent ‘ethnographic eye’ for representing the complex interweaving of diverse cultural relations. In this vein, she criticises Melissa Llewelyn-Davies’ early anthropological film, *Masai Women* (1974), on the basis that ‘the film’s academic thesis functions to absorb all details into a single coherent argument about how gender structures Masai society, rather than exposing how it operates in day-to-day life’ (Grimshaw 2001: 158). Of course, this relates directly back to the debates within written ethnography over the ways in which the ethnographic imagination may be ill-served by attempts to conform to the academic norms of a single coherent argument (see Clifford and Marcus 1986).

In the decades since the appearance of Clifford and Marcus’ *Writing Culture*, the ‘rhetorical turn’ in ethnographic writing has challenged the supremacy of the scientific model of ethnographic report. As we noted in Chapter 2, this has resulted in experimentation with a number of new writing genres. For example, ethnographers have increasingly embraced the story-form and the autobiography as a means of foregrounding the necessarily subjective and constructed nature of their accounts (see Goodall 2000). In some writing, ethnographic representation becomes the complex activity of weaving together stories that are self-consciously partial and multiple. This kind of narrative interweaving can certainly be done on the printed page, but the results are arguably rather messy. Such attempts are struggling to convey that contemporary consciousness of radical interconnectivity and contingency which, arguably, lies at the very core of electronic writing. It is a consciousness that hypertext effortlessly embodies, even imposes. Hence, sticking to the book-form to convey it seems rather limiting. It is, we would suggest, more a function of the persistence of powerful publishing conventions and markets than representational considerations alone.

The single coherent argument of academic ethnography and qualitative research has classically deployed extracts from data records in the form of quotations. Since data records are rarely presented in the book-form, except (occasionally) within the appendices, the activity of incorporating selective quotation and citation into the argumentation has become part of the art of sociological and other academic writing. Like the narratives that record the author’s observations about the data, these citations are framed in such a way that they carry a major burden of the academic argumentation that is proposed (Atkinson 1990). Formal propositions direct the reader’s attention to the explicit analysis, the theoretical framing and the literature, but they do not on their own accomplish the text’s argumentation. This is achieved through a complex and skilled interweaving of citations, quotations, narratives and propositional statements. It produces a sequential text that we recognise and accept as convincing. In hypertext,
the author is liberated from this sequential text, which in turn threatens to undermine the established rhetorics of academic writing. Because data can be presented directly and in their entirety, there is no longer any need to cite, summarise or quote from them. In addition, descriptive detailing of the research setting seems redundant where the fieldnotes themselves, or, indeed, the video footage of the field can be made available. It is not necessary painstakingly and at second hand to describe a sequence of events when the reader can grasp this directly from scanning the data records. However, as we will suggest below, sequencing of some kind must remain in ethnographic hypermedia representations, since it is certainly not desirable to turn qualitative research writing into a mere electronic database of empirical materials. But without the discipline and direction provided by the single sequence, the rhetoric of academic authorship is dispersed, and thus the claim to ‘credibility’ may potentially become harder to sustain (Douglas 1998).

Without the scaffolding of ‘accepted’ conventions imported from the book-form, the task of establishing credibility needs to be addressed from within a developing debate about hypermedia and its particular qualities.

**Commencing representation: the dilemmas of freedom and control**

In an ethnographic hypermedia environment all data records can potentially be made available to the reader through linking. The records of the analytic processes used to interpret data (such as coding frames, charts, typologies, linking conventions, interpretative categories, and so forth) can also be presented. This contrasts to book-form outputs, where the researcher’s fieldnotes, analytical memoranda and other empirical materials are not usually available for the reader to inspect – even copious appendices rarely carry full records of all of the data. There is therefore a blurring of the data–analysis–representation boundaries in hypermedia research. It is difficult to draw clear dividing lines between the completion of analysis and the commencement of writing-up or representation. This means that the stage in which the writer begins constructing a ‘public’ account is also one where analysis and interpretation are likely to be ongoing activities.

This blurring can be seen as both a benefit and a problem. On the one hand, it allows the writer to keep incorporating insights and arguments right up until the moment in which s/he decides to end the authoring process. Indeed, decisions about how best to present the material will be made in the light of this ongoing process of analysis. As electronic environments can always be expanded and amended, there is no cut-off date wherein the interpretative process is declared complete and the manuscript necessarily ‘handed over’. This reflects, in a useful way, the fact that qualitative analysis can never be a set, finished task with a definite duration. On the other hand, there are two related dangers. One is that the authoring strategy becomes impossibly unwieldy and complex due to the temptation of overburdening it with diverse analytic pathways. The other is that the later stages of analysis become overshadowed by
presentational considerations, so that the demands of writing for an audience (such as for readability, screen-design, navigation, and so forth) come to govern the direction that analysis takes. Both of these are issues that need to be acknowledged and, we advise, guarded against where possible.

There are a number of steps in the process of hypermedia analysis which clearly also constitute the early stages of representational decision-making:

- The latter stages of analysis will involve the ethnographer in the production of a number of data nodes and interpretative nodes (see Chapter 7). Data nodes will consist of selected data records or extracts from data records. Interpretative nodes are the authored texts which (re)present aspects of the analysis/findings to the reader (best suited to computer-screen reading if they are kept relatively short). We should note that the extent to which the author will produce fine-grained, dense and numerous interpretative texts will depend on the degree of explicit ‘authoring’ that is embraced (see below).

- While interpretative texts are being created, the author will also be hyperlinking them to selected data nodes – i.e. to the relevant data including, where appropriate, video footage/montages and photographs/graphical images.

- As well as hyperlinks between data nodes and interpretative nodes, there is also likely to be an extensive and growing network of data-to-data linkages, which in turn represents the emergent analysis (see Chapter 7).

- At the end of the analysis stage, then, there will be a number of interpretative nodes hyperlinked to data nodes. In addition, where appropriate, the latter will in turn be hyperlinked to other data nodes. This is where the analysis bleeds into the representational phase, for, in finalising the hyperlinks among these interpretative and data nodes, the author needs simultaneously to consider how to order and structure them for representational purposes.

Like any other form of authoring, how best to offer the representation(s) to the reader is always a key consideration. As we have noted, hypermedia’s labyrinthine qualities potentially disrupt the concept of the mono-linear text. Instead, the reader can be offered and can follow a multitude of pathways or ‘traversals’ (Lemke 2002a). Given this labyrinthine or ‘rhizomatic’ characteristic, the researcher/author can never ensure that the interpretative texts s/he has created will be traced in any one particular order. It follows that the major issue confronting the hypermedia writer will thus be to consider whether s/he wants to impose a degree of sequentiality, and if so, how and to what degree. Certainly, there is a continuum of control implicit in the decision-making process here – from the most tightly structured hypertext (where few if any link choices are offered) to the most loosely crafted. This question lies at the very heart of hypermedia representation.

Let us consider the very ‘loosest’ end of the continuum, and imagine a representational environment where there is no overt interpretation presented to the reader (i.e. where there are no interpretative nodes provided. And where the reader has free
choice to roam). Since any hypermedia environment can grant access to all of the data records as well as to the methodological/analytic tools and devices used, the reader could theoretically be left to explore the electronic environment by herself. This would leave the data interlinked, but largely unencumbered by the interpretation of an ‘author’. Leaving aside for a moment the question of whether this would qualify as research presentation, let alone ethnography (since it involves no explicitly authored writing), this would certainly give the reader maximum freedom and the least intellectual steer. In effect, the hypermedia environment would take the form of a ‘clickable’ electronic database of multimedia data records. In such a scenario, the ‘author’s’ task would be to organise the database of empirical materials in such a way as to ensure that everything was easily accessible, identifiable and navigable. (This is far from a simple matter of organising and archiving materials; it also involves the provision of appropriate navigation and orientation tools. These require considerable thought and time both to create and put in place.)

However, we take it as read that such a scenario is unlikely to find favour either with researchers (for their intellectual input would be greatly reduced) or with readers (who would face unaided the Herculean task of interpreting a vast and unfamiliar universe of undigested meaning). Our starting point, therefore, is that researchers will want to continue producing their own interpretations and presenting these as authoritative readings. In doing so, they may well wish to underscore the contingency of their interpretation, but will want to ensure that the reader can identify, make sense of and follow it. And yet, each interpretative text must necessarily be fairly brief if it is to be screen-friendly. Accordingly, in order to build up a full ethnographic interpretation, interpretative texts will need to be laid out in a specified order (or at least their ‘preferred’ order will need to be identifiable as such by the reader) so as to render their analytical meaning navigable. This immediately introduces the need for ‘paths’ or ‘trails’ of interpretative nodes to be constructed by the writer and offered to the reader. It also introduces the central tension – between freedom and control – which lies at the heart of hypermedia representation.

Our conception of an ethnographic hypermedia environment represents a hybrid between the two extremes, enabling the reader to access both the data and the researcher’s interpretations of them. Hence, producing an ethnographic hypermedia environment for a readership is likely to involve two distinct, though inter-related phases of work.

First, organising the data and analysis into navigable form. As analysis deepens, the hypermedia ethnographer will progressively refine the hyperlinks among his/her data records, creating a readable and navigable network. This will involve providing important signposting and descriptive indicators identifying all the materials and their provenance. The ethnographer may also be engaged at this point in writing and interlinking a number of interpretative nodes along the way.

The second phase begins as these hyperlinks become finalised. In our approach, it involves the construction of a number of meaningful ‘trails’ through the emerging hypertext. To do so, the ethnographer works on organising and presenting the interconnected...
data nodes and interpretative nodes in such a way as to facilitate readers’ access to them. Links may be refined, added, deleted or otherwise amended. During this second phase, the interpretative texts so far produced will be revised and, probably, multiplied. The task then is to present the reader with the author’s interpretative texts in such a way that they can be followed and understood (and indeed challenged). Thus the reader will be able to follow an authoritative account, derived from the analysis conducted. Yet the reader will also have access to the entire hyperlinked collection of data records, where appropriate, on which the analysis is based. Obviously, the reader will need to have these trails clearly signposted and easily navigable. But s/he will always be able to ‘stray’ from the path by following hyperlinks into the data records and not returning straight away.

This dilemma of freedom versus control is one of the most contentious issues confronting hypermedia ethnographers. How can structure be introduced such that readers can easily follow one or more authored interpretative trails, without smothering the creative potential of hypermedia’s inherent structurelessness? It is possible to create deliberately chaotic, unstructured hypertexts, or to use hypertext to subvert traditional texts. But we suspect that, by and large, academic authors will not want to sacrifice structure in their attempts to construct narrative and argumentation that is persuasive (if recognised as contingent). We suggest, consequently, that the hyperauthoring problematic centres in particular on questions of navigation – how does the user get from A to B? – and orientation – how does the user assess ‘where’ they are? It also centres on the issues involved in integrating the visual, aural and written planes of representation. This brings us to the question of design.

Hypermedia representation as design

In contemporary contexts of communication, we are increasingly becoming familiar with the interaction of a range of media and modes. Communicational landscapes (including books and magazines) have moved from the largely monomodal to the multimodal (Kress and Van Leeuwen 2001). Design technologies have become increasingly ubiquitous in various public environments, too, aimed at making them communicate selected messages (Dicks 2004; Julier 2000). We live, undeniably, in a world shaped by design practices. In activities of representation, consequently, the question ‘what mode for what purpose?’ has moved centre-stage (Kress and Van Leeuwen 2001). Ethnography, and qualitative research more generally, is situated within this world of design-consciousness. Ethnographers have conventionally established their competencies around one mode – either that of writing, or that of film/photography (or, more rarely, both). This focus produced the classic debates around, and refinements of, the qualities of the respective modes. For example, there have been debates within visual ethnography over camera style, and debates in written ethnography over narrative style. Now that these demarcations are collapsing, ethnographers and qualitative researchers are able to deploy a wide range of different modes and media in the integrated platform of the
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computer screen. Accordingly, we suggest, their competencies need to expand to include the stratum of multimodal design.

This area potentially includes the various dimensions of screen design utilised by Web-page writers. Lemke (2002a), for example, shows how coherence in Web pages is achieved by the complex interweaving of visual and verbal semantics. Colour and typeface become important aspects of the screen’s cohesion. A developing body of work on discourse analysis, linguistics and semiotics is seeking to codify and make sense of these new image/writing/sound combinations (see Iedema 2003; Macken-Horarik 2004). Here is not the place to try to enumerate the complex semiotic issues at stake in these developing bodies of expertise. Indeed, we might point out that digital images and sound have not so far – or at least not in combination with writing – developed into a primary communicative composite mode for ethnographers and qualitative researchers. Hence, the relevant ‘grammar’ of multimedia semiotic resources has not yet been developed. Kress and Van Leeuwen (2001) point out a similar example in a discussion of the mode of gesture. This remains a secondary semiotic mode where spoken language predominates. But where the latter is not available, as in some deaf communities, gesture has developed into a fully communicative mode that can substitute for spoken language. Similarly, as writing has always predominated in academic representation, other modes have remained undeveloped. They have instead played the role of secondary or ancillary support, such as images for illustrative purposes. Once writing’s monopoly becomes challenged or eroded, other modes are likely to be developed with the purpose of academic representation in mind. Similarly, film (and television) has always banished writing from the screen (confining its role to titles). In hypermedia, as Bolter (1999) observes, we can anticipate the ‘revenge’ of writing on film, for it comes to occupy a distinctive communicational role alongside images and the spoken word.

Writing on the computer screen does metamorphosise, however. Or rather, its various modal properties are brought into the foreground and made available for exploitation by authors. In particular, its spatial, graphical elements are re-emphasised on the computer screen. It becomes a resource made of building blocks which can effortlessly be moved around the screen and typographically enhanced to bring out different semiotic effects. Directionality (how writing travels over a page), for example, is becoming part of the meaning-making resources of writing in a way that it perhaps wasn’t before. Hence, writing is revealed not so much as one unitary mode but as a composite mode (Kress and Van Leeuwen 2001). In print-derived styles, it was traditionally treated in a very restricted way (following well-established conventions such as uni-directionality down a page with white-space margins). But on a computer screen, directionality can be exploited by breaking text up and moving it around.

It can be seen, then, that ethnographic authors now have available to them a degree of multimediality and multimodality which before was seldom considered, or, if considered at all, largely ruled out of court for academic representation. The challenge for ethnographers choosing to present their work on the computer screen is that their choice of modes and media is always going to contribute to the making of meaning. Different modes afford meaning in different kinds of ways, even though those differences
may not be easily and straightforwardly specified. If every screen-design choice that the ethnographer makes is redolent with meaning, then those choices become burdened with a significance that is as yet largely uncharted. If a certain colour/image/sound/graphic is chosen over others, for example, what will be the implication for the ethnographic or sociological meanings conveyed?

Developing a map of the kinds of multimodal implications of particular screen-design choices is an important task awaiting qualitative researchers in the digital age. The development of computer writing tools so far has largely been confined to instructional hypertext and to literary works. However, the communicative purposes of qualitative researchers differ from those of the fiction-writer, literary critic or teacher. A qualitative researcher may be wary of claiming the status of science for his or her end-product, but will inevitably want to claim for it an authority that will be accepted within the academic and/or policy-related communities. At the very least, then, the end-product will be intended to convey reliable and authoritative knowledge about the social world, arrived at on the basis of accurate empirical exploration and ethnographic description. In order to activate the desired meanings on-screen, then, the digital ethnographer will need to consider and control the design choices available.

As Pauwel (2002: 152) argues, ill-considered choices about the resources of meaning-making at the hypermedia ethnographer’s disposal (in terms of text, layout, image, sound, link, etc.) can easily work to undermine the academic value of ethnographic and other sociological work presented on-screen.

For these reasons, finding and implementing a suitable design-code for the screen is one of the important tasks of ethnographic hypermedia representation. This may consist of a conscious decision to limit the colours and typefaces used, as well as adopting a set screen layout (with particular kinds of information consistently positioned and identified in dedicated areas of the screen). Buttons and clickable hyperlinks also need to be consistently and carefully placed so as to aid accessibility and communication. The size and appearance of the ‘window’ that appears for video playback will also matter (making sure, for example, that it does not obscure other information). In short, there are a large number of potentially important decisions to be made in relation to design. One of these issues is the question of structure, to which we now turn.

**Sequentiality and navigation**

To produce a well-organised and easily navigable environment, a structure needs to be found that will enable the reader to explore identifiable trails of interpretative and data nodes through the entire network. This brings us to the question of sequentiality.

**Sequentiality**

Assembling sequences of one kind or another is integral to the art of hypermedia representation for qualitative research. Sequences can take two forms. First, there can
be sequential ordering within a screen or 'node' (intra-node). Second, there can be sequentiality among different screens or nodes (inter-node). Individual interpretative texts are unlikely to stand on their own as fragments of meaning isolated from each other. Instead, the ethnographer will wish to link them together into one or more narratives or arguments. This will involve (intra-node) sequences that may construct a narrative of events and actions (an edited video clip with authorial voice-over, perhaps, or a series of text-boxes recounting particular episodes or relationships). Or it may consist of theoretical exegesis, comprising formal propositions (these are likely to be in written form, although they could equally take the form of audio 'talking heads'). Data texts, too, are likely to be sequentially ordered, in that they reveal the order of observed events as recorded: a filmed sequence of events; a transcribed interview; a set of fieldnotes, a scanned-in series of photographs, and so forth.

There are two major modes of sequentiality in book-mediated ethnographic writing (Atkinson 1990). There is narrative sequentiality (the representation of events, the description of settings, etc.) and there is propositional or theoretical sequentiality (an argumentative exegesis that makes statements, provides evidence, identifies significance, draws conclusions, etc.). In the first mode, sequentiality provides such page-turning mechanisms as the gradual revealing of a subject-matter, a chronological ordering of events, the description of settings, even suspense. In the second mode, it allows a rational step-by-step argument to be assembled and signposted. There are, therefore, (at least two) motivations for retaining sequentiality in new forms of academic writing.79 There is also the principle of outline in printed texts (principles of relative importance). The outline establishes the hierarchical organisation of writing into paragraphs, titles and subtitles, chapters and parts (Barbules 1998: 106 passim; Bolter 1991). Bolter sees the tree-and-branch structure of computer-mediated writing as the perfect medium for making the outline crystal clear to readers. For Barbules, on the other hand, hypertext adds in the additional principles of bricolage (as opposed to outline) and juxtaposition (as opposed to narrative). These are, however, supplements, he argues, rather than replacements.

Hence there are good arguments for retaining various ordering and sequential functions in electronic writing. As Bolter suggests, the hierarchical function can be easily implemented in hypertext, if one so wishes (most contemporary electronic journals testify to the way in which the computer enhances a tendency towards the hierarchical outlining of texts into sections and subsections). Yet narrative and propositional sequentiality are more difficult to implement in hypertexts. Indeed, the two forms of sequentiality are not, even in print form, clearly demarcated. Argumentation is not constructed, still less authenticated, through the propositional mode alone. As Atkinson (1990) has argued, a ‘rhetoric of persuasion’ pervades academic writing in both modes. The ways in which evidence is introduced, the framing it is given, the trust that is established between author and reader to believe that ‘that’s the way it was’, the degree of ‘vraisemblance’ that is established – these all go towards aiding and sustaining the interpretation and theorising that occurs in formal abstract propositions. So, argumentation is often not expressed in explicitly stated propositions, but in
the very textual organisation of accounts. For example, in the way we select and write descriptions, narratives and so on; how we organise texts in thematic elements; how we draw upon metaphorical and metonymic uses of language; how, if at all, we shift point of view, and so on (Atkinson 1990: 62).

Sociological and other academic writing is saturated with rhetorical devices of all kinds, geared towards making the account interesting, persuasive and credible to the reader. Similar conventions, also frequently unacknowledged, underlie the typical narrative structures of ethnographic film. As Nichols notes, most film narrative is characterised by ‘the canonic story form of an introduction to characters and setting, presentation of a disturbance or puzzle, a goal-oriented line of casually linked situations and events, followed by a resolution to the disturbance or solution to the puzzle that leaves the mind at rest in [ethnographic film] as well as fiction’ (1994: 67). Hence, spectators are likely to bring powerful expectations of narrative pleasure to their viewing, which filmmakers find hard to deny in their editing practice. In hypermedia, clickable sequences of video-film and written texts can provide similar pleasures of ‘goal-oriented’ reading. But the fact that narrative and propositional sequentiality are more difficult to implement in hypertexts means that other ways of keeping the reader’s interest and engagement ‘on track’ may need to be fashioned. As we explore below, it is possible that a new ‘rhetoric of links’ will need to be established that can substitute for these kinds of print-derived sequentiality. In addition, the difficulties of orientation in electronic space need to be remembered. The network structure of hypertext encourages the reader always to move away from tightly controlled journeys and to explore the network. This means that the hypermedia writer needs to provide consistent screen titles and links that will (a) identify for the reader the contents of the page they are currently ‘on’ and (b) take the reader back to the sequenced trail they have left. These may range from simple back functions (familiar from the Web) to more customised directions (such as ‘click here to return to trail X’ or the facility for readers to bookmark and/or add comments to pages to which they wish to return).

The real challenge, therefore, of hypermedia sequencing is the question of moving between nodes (inter-node) – the question of navigation. There is, first of all, the problem of striking a balance between allowing the reader freely to explore links and nodes, and providing trails that proffer mapped-out chain(s) of interpretation. Second, however, there is the question of progress. As George Landow (1997: 125) points out, book sequences provide the reader with a physical orientation which identifies how far the reader has progressed (through page numbers or, more prosaically, by the centimetres of paper remaining before the back cover is reached). The end of the book represents the reader’s goal. In hypertext, however, the reader has no sense of progress towards a goal unless this is specified by the author. The sense of spatial and temporal journeying, then, has either to be artificially created through identified points of departure and arrival, or left to the reader to construct retrospectively through the pathways they choose. This introduces particular dilemmas of orientation for the reader.
Maps, guides and compasses

In the complex intertextual networks that hyperauthoring produces, it is useful to find an organising metaphor that will encapsulate the navigational principles underlying the work in question. Different metaphors have been proposed by different hypermedia writers, and different principles of navigation put forward. For example, in hypermedia for teaching and learning, various models of ‘cognitive architecture’ have been proposed, organised through different navigational metaphors – such as the modular ‘bee-hive’ structure, or the tree and branch pattern. These direct the reader’s progress along main routes and planned ‘excursions’, and ensure that particular learning goals have been achieved at particular points.

A philosophical hypertext, such as David Kolb’s *Socrates in the Labyrinth*, requires a different kind of navigational framework that will provide the sequentiality of logical reasoning. Kolb details various structures and experiments with them in four subsidiary hypertexts. For example, in *Earth Orbit*, there are cycles of argumentation that spawn other cycles, forming a series of clickable orbits around a central theme. In *Habermas in the Pyramid* he constructs a hierarchical pyramid, in which the top-level node consists of a series of postulates, each one of which is a link. Selecting any of the links takes the reader ‘down’ a step of the pyramid into a more detailed set of postulates, each of which is also clickable to move down a further level and so on until the ‘bottom’ of the pyramid is reached. Other, more prosaic, navigational frameworks are suggested through metaphors such as the folder system, or even the plain old table of contents (Landow 1997: 130–2).

In hyperfiction, there has also been experimentation with various kinds of navigational frameworks (see Chapter 3). In his hypertext *Victory Garden*, written in response to Michael Joyce’s heavily ‘controlled’ *Afternoon*, Stuart Moulthrop produces a hypertext with a map as its main point of departure. By selecting various parts of the map, readers can explore the ‘garden’, meeting a variety of characters and encountering a series of events as they gradually make sense of the narrative. Deena Larsen has experimented with a variety of navigational metaphors, including a patchwork quilt (*Samplers*) and journeys in water (*Disappearing Rain*). In all these cases, there is a greater or lesser degree of navigational control exerted by the author, varying from tiny excursions away from and back to a step-by-step sequence, to multiple branches off into loops, cycles, new pathways or networks. These navigational frameworks all result from decisions made by the author as to how she proposes to manage sequencing for her particular hyperauthoring project.

As we have indicated there are a number of interesting questions posed by thinking of hypermedia reading and writing in terms of navigation and orientation. We shall limit ourselves, here, to two of these. First, we describe how we arrived at a metaphor for sequencing in our own ethnographic hypermedia environment. Second, we examine some of the implications of considering hyperauthoring in terms of a *rhetoric of links*. 
Guided tours

Structuring a hypermedia environment involves the author in a difficult balancing act between retaining the openness and reflexivity of the text and constructing a representation that is persuasive and credible. In our own work we have adopted an overarching metaphor of ethnographer as ‘guide’, treating the reader as a ‘visitor’ to the hypertext. The metaphor of the tour-guide was one that suggested itself due to the particular subject-matter of our projects (museums and visitor centres). It has also been widely used within interactive CD-ROMs. This is not perhaps surprising considering the metaphoric parallels between following hyperlinks on the computer screen and finding one’s way through a maze or visitor attraction – an activity for which a guide is invaluable. An early application of the tour-guide metaphor was the 1990 American History experimental database discussed by Kress and Van Leeuwen (1996). However, the ‘authorial voice’ of the guide was minimally exploited in this case. In fact, the twelve guided tours all use the same written text. Accordingly, when readers encounter a screen in this database, its contents do not reflect that of a particular guided tour, for the same text is encountered in different tours.

This throws up a further interesting consideration for hypermedia writers. To what extent should a piece of video-film or written text serve more than one interpretative trail? Or should all trails have their own unique contents? Since a node encountered on one trail will signify, inevitably, in a different way than if encountered on another, writers may well wish to exploit this opportunity to alert the reader to the multiple meanings of different data records, or even interpretative texts. For example, one can well imagine the same video sequence of a school classroom inviting very different interpretations when encountered on a trail about the gendered social interaction of children, say, than one about the gendered social interaction of teachers and children. Most obviously, in the latter, the viewer’s attention would be directed to the teachers rather than to the children exclusively. Such multi-semiotic qualities could also be exploited using different combinations of split-screens. One screen can show a constant video sequence while its juxtaposed neighbour shifts from sequence to sequence – showing up the way in which in film montage meaning is always produced through the combination of images.

Our own work on the heritage museum EHE has developed fledgling of ‘tours’, focusing on specific ethnographic narratives. Each tour features a base link from node-to-node so that a reader can follow the tour in a simple way by hitting the ‘return’ button. Text nodes take the reader on ‘excursions’ into optional parts of the tour (‘detours’). The hypertext itself was planned to incorporate four ‘levels’ (though these remain unimplemented), with the tours constituting one level. We also wanted the ‘visitor’ to be able to move to related nodes on one of three levels: theoretical (to nodes which introduce particular debates from the literature), contextual (to nodes which gave background information on places, events, situations and people) or reflexive/methodological (to nodes which gave insights into the various methodological issues...
posed by hypermedia). Through the use of a consistent hypertext structure to enable
the visitor to understand where they are in relation to the whole, as well as consistent
navigation strategies to aid the visitor in understanding where their choices will lead
them it is possible to minimise reader disorientation.

In our work, the guide assumes the ‘authorial voice’ of the hypermedia environ-
ment, but reconfigures authorship into the roles of ‘showing and telling’ – the show-
ing of the data and analysis, and the telling of different stories. The hypertext provides
a network of interlinked texts, and the ethnographer-guide ‘shows’ the visitor around
these, as well as offering trails of ethnographic interpretation. The guide takes the
visitor on tours which represent particular interpretative stories, yet along the way
constantly points out the other pathways that could be taken. The tours are designed
to be credible and persuasive, in that they interweave interpretation and data texts in
the usual academic manner. Propositions and narratives assembled from node to node
offer data as evidence and illustration, through links that depart from particular inter-
pretative texts into nodes that present the data. In this way, the visitor is always just a
click away from the data records, which are not taken out of context through con-
ventional techniques of citation. Hence, the visitor can read, hear and see the voices
of the ethnographic subjects, as well as the guide’s own voice. In addition, there are
links from data nodes to other data nodes so that the guide invites the reader to note
particular contrasts and contradictions, and thereby experience some of the complexity
of knitting analysis together into interpretative frameworks.

Users or ‘visitors’, on the other hand, have their own investments and motivations
in visiting the hypermedia environment. They are visiting the hypertext as well as
visiting the ethnography, and may need the ‘guidance’ of technical ‘help’ functions as
well as that of the authorial voice. Visitors can use the guided tours to orient themselves,
but they can choose what to visit and when, and can make their own tours and detours
that cannot be controlled by the guide. Visitors will have different kinds of intertex-
tual knowledge to bring to bear on their encounters, and this knowledge will influ-
ence what kinds of detours they will want to pursue. As long as adequate orientation
facilities are always on hand (we suggest permanent on-screen home buttons, glossary
buttons and maps of the tour so that progress can be determined), visitors are able to
explore tours that are already mapped out, as well as discover new tours that offer a
different perspective on the data.

The communicative value of hyperlinks

Tours or trails allow the hyperauthor to retain that sequential structure which – at base –
derpins the art of academic argumentation. In its simplest form, the connection
between the base nodes in each tour consists of a simple ‘next’ relation. Activating the
link to the next node in the tour equates to a turning of the page in a book. In the
case of tours, then, the rhetoric of persuasion is not hypertextual, in that the link merely
has the function of an ‘and’ or a ‘then’, and adds little to the narrative constructed
within each node. On the other hand, the ethnographic hypermedia environment potentially allows much greater freedom than this base-level node-to-node progression. There are always other links available to reach the data and other levels. However, the act of clicking these other links is the point where orientation can be lost – for the reader does not know where the link is leading until arrival. It is then left to the reader to scratch his/her head and figure out what the connection was. This can be a frustrating experience, and one which represents a diminution of the close author-reader relationship offered by the book.

The danger in hypertext is that we merely assemble an interconnected web of text-fragments which are all linked together ‘because they can be’. The reader stumbles from node to node encountering a confusing morass of ‘bits’, following links between them that are endless and meaningless trails of ‘ands’. Whereas the book deploys all kinds of sophisticated tropes and rhetorical turns to associate concepts together, the link can seem just a bland and arbitrary bridge slung any-old-how between two points. Worse, links can send confusing messages about the ‘point’ of the sequence. Some of these issues have been raised in a very useful discussion by Nicholas Barbules (1998). As he points out, even if it is only ‘and’, links in fact always do carry meaning: ‘they imply choices; they reveal assumptions; they have effects – whether intentionally or inadvertently’ (1998: 117). Barbules identifies a range of meanings of commonly-used links on the Web, and points out that it is the link, and not the node, which provides the means of constructing a chain of interpretation. A link, for example, can suggest a metaphorical or a metonymical relation between two nodes. The link makes the two nodes signify in relation to each other, much as video montage creates meaning through the juxtaposition of images. Meaning occurs between signs, and not just within them. If authors ignore the semantic importance of links, they can end up merely constructing endless chains which have no persuasive power, and which fail to enable coherent interpretation. A principled and well-structured ethnographic hypermedia environment, therefore, will need to employ a rhetoric of links. Once again, there is a trade-off to be considered between freedom and control. Specifying the function of every link closes off alternative associations between nodes. However, a small corpus of rhetorical links can be assembled: for illustration (‘for example’), exposition (‘furthermore’), contradiction, (‘however’), and others. It means labelling links in a way that readers can recognise so they can make an informed choice about following them. Unfortunately, link-categorising technology is still in its infancy, and these kinds of techniques require further development in terms of screen architecture.

**Links as ‘triples’**

Film theory has pointed to the importance of sequence in the production of meaning. The Russian film-maker Sergei Eisenstein, for example, famously argued that meaning emerges not from single shots but from their *collision* (Eisenstein 1949, cited in Barbash and Taylor 1997: 373). Eisenstein’s techniques of film montage were
designed to exploit the inherent associative qualities of meaning. If you see two images consecutively, your understanding of the second image is changed by your understanding of the first. This is the case in every mode: meaning is always cumulative, made up of associative relations. Hyperlinks, similarly, join two or more units together, so that the reader’s experience of the destination link is always affected by his/her movement from the source link. Hence links can be conceptualised as triples, and are never neutral, never ‘mere connectives’ (Barbules 1998: 103). Yet, as Barbules points out, links have become so routinised via the Web that their communicative function is rarely recognised:

[Links’] ease of use makes them seem merely shortcuts, and subservient to the important things: the information sources that they make available. Their speed in taking a user from one point to another makes the moment of transition too fleeting to merit reflection; the link-event becomes invisible. (1998: 104)

He goes on to argue that we need to ‘counteract this apparent naturalness’ (1998: 104). Making the function of links explicit would help enormously in constructing that transparency of argument that is arguably essential to the achievement of rigour and credibility in academic writing.

**Control issues**

In traditional (mono-modal, mono-directional) film, speech or writing, the effects of this accumulation of meaning remain, to a degree, under the control of the producer/speaker/author. S/he can specify what comes next. In hypermedia, this control is dissipated (unless all that is allowed is a simple linear linking from node to node – in which case the text does not really qualify as hypertextual). In its place comes the potential for multi-linear accumulations of meaning. However, hypertexts can also appear to be more controlling environments than conventional texts. Any printed text can be read hypertextually, following links that the author may have suggested (such as footnotes or quotations) or that the reader may independently create (by flicking backwards and forwards through the text). In hypertexts, as Barbules observes, ‘links define a fixed set of relations given to the reader, among which the reader may choose, but beyond which most readers will never go’ (1998: 105). In theory, given access to the appropriate software resources, readers of hypertexts can design their own customised links. In practice, most will be encountering webs of connections that have, largely, been predetermined by the author/designer. These may be multiple and leave plenty of scope for readers to trace their own, virtually unique pathways; nevertheless, such pathways can only be constructed out of the links already provided by the author/designer. Accordingly, links do not only make connections, they also ‘control access to information’ (Barbules 1998: 105). They are ‘part of what can turn information into knowledge, suggesting causal associations, category relations, instantiations, and so forth’ (1998: 109). Hence, ethnographers and qualitative researchers can expose to view such strategies of control by identifying what function links are playing. They
can thereby encourage the reader to recognise the assumptions and values implied by links and to counter the impression that they are either simply natural, or authoritative in a non-reflexive kind of way.

**Links, tropes and ethnographic meaning**

Making the communicative function of links explicit involves specifying the kind of relationship that links two nodes together. Barbules (1998) notes that on the Web, links are usually one of three types: metaphorical, metonymical or synecdochal. Links which are metaphorical invite the reader to see one thing as another, e.g. a link from an image of miners filing into a colliery to an image of a moving ant-column would suggest that pit-work is analogous to the anonymity and conformity of the ant heap. The same image linked to one of a happy crowd in a cosy bar would suggest it is synonymous with collective camaraderie and sociability. Metonymical links invite the reader to see an association between two things not because of their similarity but through their contiguity – their sharing of relationships in practice. For example, a page on ‘colliery working practices’ could be linked to one on ‘the gendered nature of shift-work’. Synecdoche, by contrast, invites the reader to see part of one thing as standing for the whole. For example, mining could be signified by an image of miners crammed into a lift-cage (inviting an association between pit-work and being trapped) or by a blackened face (suggesting the heroic suffering of humans compelled to dig in the dirt). Synecdochical links on the Web often take the form of category inclusion. A page about the history of a particular mining village could have links to various parts, such as classic quasi-anthropological categories (e.g. housing, work patterns, or kinship) or to more political classifications (such as mining disasters, strikes, and technological change). The choice of the part affects the way in which the whole is perceived.

These three link-types are ubiquitous on the Web, though often hidden (in the sense that readers are unlikely to be aware of them). However, these types of links will not necessarily be the most appropriate ones for the hypermedia ethnographer. This raises interesting questions about the kinds of links that ethnographers are likely to find most valuable. There is the question of how far links should be generated from within the data, and therefore be project-specific or whether a common set of links could be established that would serve all projects. It seems likely that, in practice, ethnographic hypermedia environments will generate both standardised, typically ethnographic, linkages as well as more project-specific ones.

The Web works as a means of connecting together on the same level vast amounts of information, with the trope-links suggesting different kinds of relationships among them. These links are based on associative connections between diverse nuggets of information. As Barbules (1998) notes, this puts all information on the same level of accessibility and credibility, hence suggesting a flattening out of information. On the Web, the most significant thing can be connected together with the most trivial. Once links are followed, it is up to readers to consider what, if anything, it all means. Such an approach, it seems to us, is unlikely to suit the purposes of ethnographers. The links they make...
must generate ordered knowledge rather than work largely through associations alone. So ethnographers are unlikely to assemble their networks of links purely in accordance with the Web’s guiding principles of associative tropes such as metaphor, metonymy and synecdoche. They will undoubtedly, of course, make use of these tropes, as they always have done (see Atkinson 1990). In particular, the trope of synecdoche has long been central to ethnographic representation. But ethnographers and qualitative researchers will also want to adopt some of the principles of traditional academic writing. They will perhaps make extensive use of the principles of outline in order to create hierarchies. Expansion, for example, is a key function of rhetorical structure, and represents an extremely common function of hyperlinking (Lemke 2002a). Typically, a Web page will offer bulleted link-options, which will link to pages that give additional information of one kind or another. Expansion can take any of multiple forms, including elaboration, restatement, exemplification, specification, exception, alternative, and so forth (following Halliday’s 1994 theory of functional grammar). Expansion is likely to be an extremely useful link-function to ethnographic hypermedia authors. Readers can no doubt think of others, and there is certainly further work to be done in developing a rhetoric of link-types that will serve the more conventional functions of ethnographic writing.

The rhizomatic qualities of hypertext also suggest their own rhetorics which have the potential to take ethnographic representation in new directions. Bricolage and juxtaposition, for instance, can be used to suggest alternative or contrasting interpretations of the same situation or event. Ethnographers will undoubtedly wish to take advantage of hypertext’s labyrinthine qualities in ways that we have not attempted to address here. We have been more concerned to try to demonstrate the potential of hypertext for conveying the kinds of insight which are capable of being produced within traditional representational modes, but in ways which are more suited to the reflexive and multivocal priorities of current ethnographic thinking. Yet we do not wish to underplay the potential of hypertext radically to disrupt established ethnographic patterns of argumentation, and, in doing so, to generate new kinds of insight in the process.

There are also potential dangers in hyperlink-based writing. In post-paradigm ethnography (see Chapter 2) there has been a desire expressed to expose the rhetorics of ethnographic representation – to make them visible and hence to denaturalise the connections and assumptions that ethnographers have traditionally made. Hypertext does not necessarily offer such visibility; indeed, it can work to make things more opaque. As Barbules (1998) warns of the Web, the invisibility of links can serve to naturalise relations between things without allowing the reader to distinguish what kind of connection is being made. Such expectations may also pervade reading approaches to hypermedia ethnographic texts. Hence, one node linked to another (sequencing) may be read as cause-and-effect, particularly where this is suggested by beliefs about the world ‘outside’. We have suggested here that part of the solution may be to make the functions of links explicit. We also concur with Lemke (2002a) in arguing for using links in a motivated manner. Just because we can make a link, we should not necessarily do so.

Another potential danger in the reading approach to hypermedia ethnography is suggested by hypertext’s superficial affinities with already-established electronic genres.
such as computer games. In the ages of multi-channel communication (TV channel-hopping, skimming through glossy magazines, CD-sampling, digital pre-set radios, etc.), readers have become more alert to the multiple choices available to them and more able to ‘parallel process’ different materials simultaneously. Online resources acknowledge and reinforce these fragmenting approaches. Through its analogies with gaming, hypertext reading encourages a trial and error, experimental approach to reading: ‘just click and see’. This may be beneficial in some respects; in others, it can foster a casual, uncritical approach where links are merely activated rather than reflected upon. And the electronic hypertext may be explored distractedly, in a restless and ever-mobile manner or perhaps with a view simply to discovering the ‘juicy’ bits lurking in the labyrinth. Hypertext certainly encourages actively mobile transits as opposed to the more reflective approach that some may argue is encouraged by the book.

Further, there is the undisputedly tricky nexus of issues raised by ethical considerations (some of which were discussed in Chapter 7). In audio- and video-editing programs, for example, it is fairly easy to blur or otherwise mask faces and distort voices. However, such techniques are likely to be embraced only reluctantly by ethnographers since they lose the semiotic qualities of facial expressions, involve quite an intrusive visual add-in, as well as possibly insinuating an equivalence between ethnographic participants and the familiar anonymised images of television ‘victims’ and ‘criminals’. The question of identifying informants is likely to be an increasing problem as wider access to data becomes possible. For example digital data sets from CAQDAS programs such as NUD*IST could be electronically stored and retrieved fairly easily to allow future researchers access to the original data. Such issues require the application of ethical codes (as well as coming under the ambit of legally enforceable laws of privacy such as the UK’s Data Protection Act). Video, in particular, raises a host of ethical dilemmas (some of which were discussed in Chapter 4; see also Barbash and Taylor 1997). In general, of course, the principles of informed consent should inform all practice. In hypermedia work, as in other platforms, the means of distribution should be made clear to all participants. However, the ethical challenges of hypermedia work are still to be fully addressed by the research community.

**Conclusions**

This chapter has discussed some of the key issues for authoring hypermedia ethnography. Hypermedia representation embodies in itself a recognition that analysis and interpretation are always contingent. This is due to its ability to keep two dimensions simultaneously in view. On the one hand, hypermedia foregrounds the openness of meaning by granting readers access to the whole corpus of data and thus showing the potential for an almost infinite number of links to be made among nodes. On the other hand, it provides a means of representing fully-realised academic interpretations by the deliberate organisation of trails (through sequential linking), allowing the ethnographer to plot meaningful interpretative routes through the corpus for the
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reader. What this novel kind of double articulation affords is an explicit representation of the relationship between meaning-potential (what sense could be made of the multiple universe of meanings suggested by the corpus of data) and meaning-production (what sense has been made by the particular ethnographer). Whereas the traditional model of academic representation gives the reader access only to the latter, hypermedia keeps both in view. In allowing a representation of the relationship between both, it shows the basis upon which a particular interpretation has been reached.

This should not and does not imply that hypermedia involves a radical de-legitimisation of academic authority. By providing deliberate pathways the author is, in effect, urging the reader to accept his/her interpretation as the most plausible and persuasive one. This will always, we assume, be a goal of ethnography, or indeed of qualitative research more generally. Were no pathways to be proffered, there would effectively be no ethnography, since the reader would be left entirely to find her own way and the role of ethnographer would be redundant (or reduced to the role of initial data collector and organiser). Instead, it seems much more likely that qualitative hypermedia will develop new resources of and for persuasion (which are nevertheless reflexive) based on particular models of multimodal navigation and linking.

Far from heralding, then, a radically unstructured and anarchic mode of communication, as some critics – both welcoming and hostile – claim, hypermedia initiates a new poetics of authorship. This does not mean rejecting wholesale the art of book-authoring. Indeed, it seems clear that ethnographers will not want to discard wholesale the skills and techniques of print-derived academic argumentation. What hypermedia does mean is that aspects of this art need to be looked at anew, and fresh models of rhetorical communication devised. These will not mean throwing sequentiality away, but carefully considering how to employ it within the more open and porous structures of hypertextuality. We will need to recognise that sequences no longer consist only of ‘pages’, but of more lateral, branching links that put into motion further sequences and directions. In this way, we can determine how sequences can be thought of as both nodes and links, to be co-opted into the meaning-making power of the text.

In conclusion, we acknowledge that any new form of authorship has a powerful and entrenched rival to contend with in the shape of the book (and, differently, the film). Rather than replacing either of these, hypermedia will carve out its own role. Academics may adopt many hypertextual features for their wordprocessed presentations, and indeed, may construct those presentations on the basis of hypertextually-aided analysis. They may, however, stop short of the kind of fully hyperlinking authoring discussed here. Nevertheless, as our conceptualisations of textuality have expanded in relation to new technologies of representation, academic writers have already started to rethink the ways in which we persuade our readers and interpret our data for them. The relations between analysis and representation, reading and writing, images and words, and between movement and stasis, are all potentially reconfigured in hypermedia ethnography. In the future, these changing relations will be central indices of the new digital rhetorics needed as the page blurs into the screen.
Notes

1 This is the major source of funding for UK social science research.


3 For a useful, online overview, see the CAQDAS project at the University of Surrey (http://caqdas.soc.surrey.ac.uk/index.htm).

4 This appears to be a recurrent issue with such methodological work. It is often the research associate who has all the craft skills and tacit knowledge about the procedures and methods, and all too often the expertise is lost when s/he moves on to something else. This is a generic problem, of course, in many contexts where short-term project research staff develop expertise in a specific domain but are unable to maintain continuity of research and employment. Anna Weaver did go on to use her skills with another research group, however, and published from the methodological work (Weaver and Atkinson 1995).

5 They were produced using one of those now long-forgotten copying techniques that generated mauve text that was prone to fade with time – itself a physical reminder of how technologies of data storage have changed in the span of a single lifetime!

6 It is important to differentiate between generic and specific issues. More recent versions of The Ethnograph (as well as other code-and-retrieve programs) have made it much easier to alter coding structures on the fly. Anecdotal evidence, however, supports the contention that users may still be reluctant to make such changes.

7 At the time this was a fairly innovative feature that had not been implemented in CAQDAS programs.

8 Admittedly the rate of change is so fast that what is foreseeable covers a restricted time-frame. For example, when this research was initially conducted, access to the World Wide Web was still extremely rare.

9 The necessary caveat is that such an approach is always limited by the availability of technology. For example, during the period of the first project it was infeasible to store or play video on a personal computer – the personal computers of that time lacked the storage capacity and processing power.

10 A brief technical note. We used one-shot (CD-R) discs to store video clips and a small number of rewritable (CD-RW) discs to back up most of the other work.

11 As we will discuss later, we regard these tours as works in progress. One overriding issue with hypertext is knowing when to end it. The idealistic response is that one should never finish a hypertext; there is always more to link. The pragmatic response is that you end it when the time is up.

12 This is a deliberate invocation of the term as used by Barthes (e.g. Bolter 2001; Joyce 1995; Landow 1997).

13 For example, current digital television systems allow viewers to manipulate their viewing experience in ways which approach hypermedia.
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14 In an earlier publication, Landow had argued for preserving a distinction between the two (Landow 1992: 7).
15 This nomenclature is somewhat clumsy but we wish to avoid neologisms where possible. One awkward problem is that we cannot, grammatically, refer to 'a hypermedia' so we generally refer to hypermedia products or hypermedia presentations.
16 There are ways of implementing this type of link technology on the World Wide Web but it tends to be awkward. Some of these issues may become less problematic due to the development of XML on the Web, a subject we will discuss shortly.
17 Interestingly, this ability to provide comments has been a very successful promotional tool among a range of Web sites such as Amazon.com or Epinions.com.
18 There are certain parallels between the creation of the first computer network (ARPAnet) in the late 1960s and the hypertext systems being developed by Englebart et al. (Berners-Lee 2000).
19 There is an active HyperCard users group on the Web but the members do not seem to be drawn from any particular discipline (http://www.ihug.org).
20 George Landow's home page has extensive information about the Intermedia project. Follow this link for more detailed information: http://www.stg.brown.edu/projects/hypertext/landow/HTatBrown/Intermedia.html.
22 The World Wide Web Consortium (W3C), the body tasked with developing the Web, of which Berners-Lee is a member, does maintain a freely downloadable Web browser named Amaya which has been designed to edit Web pages in-situ.
23 Synchronous Multimedia Integration Language. See http://www.w3c.org/AudioVideo for more information.
24 In fact Google has become so popular that the verb 'to google' – to search for someone or thing on the net – has been recently coined. See for example this online article from The New York Observer: http://www.observer.com/pages/story.asp?ID=3672.
26 In Afternoon the text links are not explicitly marked with an underline, or by any other technique, which means that finding a link requires a certain amount of guesswork. That said there is a way to reveal which words are linked.
27 It is possible to export StorySpace hypertexts to HTML format so that they can be stored on the Web and then linked to other Web pages.
28 The Japanese language has three different alphabets of which one is the Kanji alphabet. Kanji are pictograms which have originally been imported from China where a single pictogram represents an entire word or concept.
29 http://users.chisp.net/~textra/rain/water/dripping/dissolveindex.html
30 Sure enough, inputting the referenced character's name, Anna Mizunami, leads to no matches. Quite what would happen if a real person did get matched is intriguing (http://people.yahoo.com/). It is notable that Larsen had problems gaining permission to link to some websites (http://www.deenalarsen.net/rain/legal.html).
31 Larsen used Robert Kendall's program Connections to implement dynamic linking and some other hypertext functionality (email, 10 June 2002). See http://www.wordcircuits.com/connect/index.html for more information.
32 Flash animations have become increasingly common on the Web. Each flash item is a self-contained production that can be viewed with a 'plug-in' by a Web browser (http://www.macromedia.com/software/flash/).
33 There are academic structures in Cyborg. For example, reference links are presented using an icon to indicate that the link goes to a bibliographic entry and there are a few default
sequences through the work which are used to ground the argument, but, mostly, Greco is intent on letting the reader make their own way.

34 A discussion of the technicalities is presented in Chapter 5.


36 See the W3C Web page (http://www.w3c.org) for a full specification of XML.

37 The recent UK Research Council initiatives on e-science and e-social science could be seen as the start of this process.

38 Just a reminder that we are using ‘reader’ in a very general sense here due to the lack of any truly adequate term for the person who is experiencing a hypermedia presentation.

39 A CD-ROM stores 640MB of data. This is a huge amount of space for textual data but very little for video data. When creating a CD we left 20MB of space for any programs we might need to include, leaving us 620MB for our content.

40 This is one of the stated goals of the CAQDAS program ATLAS.ti which creates ‘Hermeneutic Units’ in which all the data is stored.

41 See the project Web site for more details of both our technology and current possibilities.

42 Indeed, the new Apple computers feature home digital video capture and editing as standard consumer equipment now and Windows PCs are likely to follow suit.

43 Monitor technology has not changed a lot although flat screen monitors have become more prevalent. It is interesting to note that now, the 20-inch (50 cm) monitor on this computer is worth more than the actual computer.

44 There are many reasons for this. Apples have been seen as more user friendly and ‘creative’ than Windows PCs. A technical reason is that Apple’s operating system handles fonts and image colours on screen more accurately than Windows computers which is why they are very popular with media companies. In addition, Apple pursued a vigorous educational discount scheme in the USA, meaning that many universities and schools became dominated by Apple machines. Conversely, in the UK, the educational computing business is dominated by Research Machines, which has tended to promote Windows computers in recent times.

45 When we created our project the Cardiff University computing centre made it very plain that they did not want to have to support an Apple system and pretty much ordered us to use a Windows system purchased from the university suppliers.

46 In the same way that consumer-level CD-burners existed in relationship to MP3’s song download, video compression technology and higher bandwidth rates on the internet are beginning to make downloadable movies which can then be burnt onto a DVD. Video piracy is likely to be a driving force behind the development of DVD technology in the next few years.

47 The name of the program is a shortening of ‘In vivo’ and refers to marking data without having to create a code structure in advance. QSR also make NUD*IST, the marketing leading program and the developers intend Nvivo to work in a very different manner (personal communication at a demonstration, 17 November 1999). The version of the program being discussed here is number 1.3, released 2002, see http://www.qsr-software.com.

48 See the project Web page and the Appendix in this book for a fuller description of the various programs and their developers.

49 The situation with Guide was quite complex. A Windows version of the program had been sold to a company specialising in producing online manuals. A non-Windows based system was in use at the University of Kent, Canterbury.

50 For a continually updated list of CAQDAS aids see the CAQDAS Networking Project website at http://caqdas.soc.surrey.ac.uk/.

51 See http://www.eastgate.com for more information about StorySpace.
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52 Through software manipulation it was possible to create scans that varied from about 12dpi to 2,400dpi. The optical resolution is a measure of the quality of the lens, the better the lens, the higher the potential resolution.

53 Technical information. A one inch square image scanned at 600dpi works out as a 600 by 600 pixel image. When saved as a Windows ‘bitmap’ (.bmp extension) it requires approximately just over 1MB of file space.

54 The JPEG algorithm is one of the two commonly used image compression techniques, the other being GIF.

55 This is a very rough estimate because there are several factors involved but, as a rule of thumb, you can compress a colour image using JPEG to around 5–10 per cent of its original size without any noticeable degradation of the image quality.

56 When Biella created his ethnographic CD, Maasi Interactive, he rejected using image compression because the computer took a long time to display a compressed file. Current computers, thanks at least to the popularity of image compression on the Web, are so fast at opening compressed graphics that there is no way to tell the difference.

57 Computer monitor sizes are measured along the diagonal. A 15-inch monitor is one that is 15 inches from the top left to the bottom right.

58 Obviously there is a wide variety of possible screen settings. Most popular settings, for Windows computers will end up with pixels about the same size. The reason for this is to do with attempting to display fonts accurately on a screen. Users with vision problems tend to set their monitors to resolutions which magnify the pixels while hypermedia ethnographers like to cram as much information on a screen as possible without getting really, really bad headaches.

59 An example, showing the separate image compression techniques is available on the project Web page.

60 One reason Biella gives for using uncompressed images in his ethnography is that his computer took a long time to display compressed images. Changes in compression software and computers means that this is for all intents and purposes no longer an issue.

61 RAM files (produced by Real audio) are popular and common but not really relevant to this discussion.

62 Each video file is produced using a CODEC which tells the player how to interpret it. CODECs vary in how much they compress the file and how much processing they take: generally the more advanced the CODEC the more advanced computer you need to play it properly. We used the standard Windows 95 CODEC for our video because it demanded fairly little of the computer.

63 Biella reduced his costs by persuading friends and family to work on the project for free.

64 It is possible also that the general integration of computer technology into academic work will have the effect of making academics both more familiar with the tools required and more interested in experimenting. If we are to predict anything it is that the current generation of undergraduates who have grown up with PCs and became familiar with the Web as children will provide the first wave of social scientists for whom hypermedia is as ‘natural’ as writing.

65 It is difficult to gauge how popular SMIL will become. So far it appears to be struggling to make an impact.

66 Nvivo does include some basic presentational devices.

67 It is notable that, in the world of television documentary, ‘fly-on-the-wall’ docusoaps and so-called ‘reality TV’ shows such as Big Brother – where participants are filmed 24 hours a day – do not use unmanned cameras. The makers know that footage needs to be produced by humans if it is to make cultural sense.
68 There is an exception to this generalisation in textual biblical studies. As Kelle notes (1997, 2000) cross-referencing is a form of textual analysis that has long been used in the study of religious texts and has been implemented in programs marketed specifically as ‘text analysis’ (e.g. Code-A-Text) rather than ‘data analysis’.

69 This is quite a complex assertion which could be further explored. Depending on the definition of hypertext being utilised, for example Aarseth’s very general depiction of hypertext as a form of electronic text (1997), an electronically coded data set could be seen as a type of hypertext. Even if this stance is taken, however, a coding structure is only very minimally hypertextual. Interestingly, some of the newer CAQDAS programs do possess some hypertext functionality but it tends not to be integrated with the coding mechanisms.

70 Version 2.0 of StorySpace for Macintosh was released in 2001 and uses Apple’s Quicktime media player to play audiovisual material. Unfortunately, according to the developer, due to a host of licensing and programming issues, when StorySpace 2.0 for Windows was released, Eastgate were not able to include any audiovisual media support.

71 The Path Browser works differently depending on which version of StorySpace you use; the version we discuss is version 1.75 for Windows.

72 There are major conceptual issues when it comes to implementing text links in a path browser and according to Mark Bernstein, lead developer of StorySpace, no simple solutions (personal communication, February 1999).

73 Since we first drafted this chapter there have been some developments in this field. One previously referenced example is StorySpace 2.0 for Macintosh and there has also been continued progress with SMIL, an XML-based language, that enables fairly complex online multimedia delivery.

74 A program, called Qualrus, released in 2002 by Idea Works, a not-for-profit company specialising in software tools for qualitative researchers. This promises to have advanced video analysis features.

75 Available at http://www.transana.org/.

76 See Chapter 7 for a more in-depth discussion of this.

77 The terms uni-linear and multi-linear are somewhat awkward but are, we believe, more accurate than the traditional linear versus non-linear dichotomy that has previously been posited for text and hypertext.

78 For analyses of textual ethnographies see, for example the works by Clifford; Clough; Denzin; Hertz; Marcus; Marcus and Fischer. For comments on visual ethnography see Barbash and Taylor; Crawford and Turton; Taylor.

79 It should be obvious here that any form of academic writing has to face the same task of representing complex analyses in a linear fashion. Yet not all disciplines are as committed to classic scientific exposition as others. It is noteworthy that the academic hypertexts published to date cover the fields of philosophy (Kolb 1994), cultural theory (Greco 1995), literary criticism (Paul) and ethnography (Coover 2003).

80 There are also all kinds of navigational devices that are not under the control of authors and which vary from software program to software program. These include particular tools for readers to keep track of where they have been and where they are going, such as Netscape’s bookmarks function or ‘Go’ menu.

81 Our choice of metaphors has been informed by our research site: a coaling heritage museum. Hypertexts focused on different topics will, naturally, be best suited by the use of different metaphors.
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