1. BACKGROUNDS, STRENGTHS, AND LIMITS

Videotape recording is increasingly included in qualitative studies. As I reviewed a large number of qualitative studies for my dissertation, I was impressed with how many of the qualitative research studies from the last few years, include video recording at some point. Collier and Collier (1986, p. 139) comment, "Film and video have become essential for the study of human behavior."

Yet as I contemplated my own research, I looked in vain for a book completed devoted to qualitative methods of making and using videos, although a number of books had chapters or sections that touched on the subject. Rare, though, were books that gave specific guidelines for planning, videotaping, and doing analysis of videotape. The need for such a book is perhaps most acute for beginning researchers, who want specific help entering the unfamiliar world of qualitative research. Yet, with so little on the subject, there are undoubtedly some who have conducted research previously and now for the first time want to add a videotape component. This book may also serve as a contribution to further discussion about the planning, execution, and analysis of videotape data among those with previous experience in this area as well.

My background includes a number of richly varied experiences that have helped me in understanding the visual and audio aspects of videotaping. As a child and later as a teenager I experimented with tape recorders and an eight millimeter movie camera, purchased with income from a paper route. Early guidance was provided by the book *How to make good home movies* (Eastman Kodak, 1966). For many hours I experimented with different lenses, positions, and special effects as I filmed family vacations, the effects of a tornado, and many other visual interests. Throughout high school and college I worked at several radio stations, learning the intricacies of good sound recording and playback. I also took the time for some course work in television production. After college I spent six weeks teaching at a tiny school hidden in the rain forest of a tiny Caribbean island, taking some time to document broom-making, children's play, religious activities, and other interesting aspects of local life using my old eight millimeter camera. Years later I purchased my first camcorder (combination videocamera and video tape recorder), experimenting for many hours with how to make good home videos. Midway through my doctoral program I made a short video to teach playground behavior coding to undergraduates for a quantitative research study we did at an elementary school. For my dissertation, I conducted a four month ethnographic study of an elementary school, which involved a wide variety of videotaping methods for many different purposes. My varied background in learning video and audio skills has helped prepare me to accomplish the goal of this book, which is sharing something of what I have learned, particularly as it relates to qualitative research. I share, not as an accomplished expert, but as one who is continuing to experiment and learn.

My experience in researching children in elementary schools, particularly during the dissertation, is especially influential to what is found in this book. While the substantive findings of that work have been reported in detail elsewhere (Ratcliff, 1995), in the present work I will include numerous examples of how I used videotape during that study, and what I learned *about videotaping* in the process. I will try to emphasize insights about video tape recording and analysis that can possibly generalize to many different contexts and topics, but time and again I will illustrate my ideas from my firsthand experience. I will also make use of the few sources I have found that speak to videotaping, including some that discuss guidelines for other forms of photography that apply or can be readily adapted to videotaping in qualitative research.

Videotaping for qualitative research can be considered a subsection of two broader fields known as Visual Anthropology and Visual Sociology. These disciplines describe and make use of many kinds of visual media, including still photography, anthropological movies, and even topics such as analysis of commercial cinema and advertising (Ball & Smith, 1992; Hockings, 1975). While reading these more general texts in these areas can be rewarding--I especially recommend John and Malcolm Collier's *Visual Anthropology* (1986)--there is often little that is specifically directed to videotape methods of research. While some of the principles of research using other visual media can be applied to videotape, and I will include many of these, often there must be some or adapting of those suggestions.

Two other sources of information outside my own study have been helpful to a lesser degree. Several books from psychology and ethology describe aspects of videotaping for quantification of data (such as Kendon, 1979; Dowrick & Biggs, 1983; Dowrick, 1991). Sometimes there is an unbreachable chasm between the numbers oriented approaches to videotaping and those appropriate to qualitative research, but not always. Of course quantification of data can be part of a qualitative design. Finally, there are a large number of books on television broadcasting and commercial cinema that can provide insights on technicalities of camera angles, lighting, and other issues that sometimes have a bearing on qualitative camera work as well. Of this genre, one of the most practical guidebooks, loaded with suggestions for making good camera shots, is Daniel Arijon's *Grammar of the Film Language* (1976). Arijon's work could make for valuable study if the reader constantly remembers that videotaping for research purposes has different goals than making movies and television, and thus suggestions appropriate for commercial media may be irrelevant or even counterproductive in a research context. Research data can be entertaining and an entertainment medium like television can make use of videotape research data, but the two diverge as much as they converge.

Why Use Videotape?

Why has video become more popular in research studies? Any video medium produces data that can uniquely add to research design. The tangible, concrete nature of pictures derives from the production of images made directly by light, and this produces a more holistic view of events and situations (Collier & Collier, 1986, pp. 7-10). Of course this does not imply greater objectivity (Prost, 1975). Video provides a unique memory enhancement for past experiences, since the content approximates their original form (Mehan, 1979, p. 16). Consequently analysis can be more complete than what is possible with standard observations (Erickson, 1992, p. 209). Scenes can be replayed numerous times as the researcher reflects on what occurs, thus reducing the possibility of premature inferences and conclusions. Erickson also notes that normal field observation tends to emphasize events that occur frequently, since there is more data on them to be compared, while a videotape of a rare event can be repeatedly observed and explored (p. 210).

Videotape records thirty frames each second, allowing microanalysis of behavior not observable any other way by comparing individual frames of the event. Details can be more quickly and easily sorted into meaningful categories. In my research I originally planned to defer videotaping until several weeks into the study, after I had adequately surveyed the context. However, because the amount of information was overwhelming, I added the videotape on the third day of observing--I simply could not take it all in sufficiently, and videotape helped me sort out the multitude of details by repeated viewings. Many other things can be done with video that are impossible with standard observation. Complex edits, with the assistance of computers and videodisks, allow incredibly intricate analyses that cannot be accomplished otherwise. Many angles can be observed that would be extremely difficult otherwise, such as the camera being suspended from a ceiling. The videocamera records subtle details not observed by the human eye, including latent aggressive and affectionate gestures (Beresin, 1993, p. 161).

As a result of these many possible variations and unique views, video tends to change the way people watch events. One begins to define future research plans in terms of video technology once skills in this area are acquired (Jackson, 1987, p. 110). New angles of observation come to mind that can be attempted and tested for data value. Sequences, including antecedents and consequences, become more salient, although qualitative researchers have often been less concerned about sequence and prediction than quantitative researchers (Agar, 1986, p. 16). Thinking of yourself and others as the future audience can influence how videotaping is done and what is videotaped. Attention can be given to details that, in normal fieldwork, might be mistakenly taken for granted as irrelevant. These changes have parallels in the history of cinema--at first stationary cameras recorded events much like a member of an audience watched a play, but later cameras experimented with new angles, special effects such as fades and multiple simultaneous views, that were not possible apart from the camera (Brigard, 1975).

Videotape adds distinctive advantages to other video media. Movie equipment is balky, and older ethnographic movies often required a camera/audio team to produce (Rouch, 1975). Early video equipment was also unwieldy, but today's camcorder equipment is amazingly small and versatile (Jackson, 1987, p. 228).

Cost and availability was once prohibitive in videotaping, but that has changed dramatically even as equipment has improved in quality (Collier & Collier, 1986, p. 221). While writing this book, a name brand camcorder with zoom lens and many other features was locally advertised for under $400, while extra high quality videotapes can be purchased for less than $3.00 each! The purchase of a good camcorder is within the price range of most researchers, and readily rented or borrowed at most universities for the few that cannot purchase a personal unit. The camcorder has become a commonplace piece of equipment in middle and upper middle class life, which contributes to availability (LeCompte & Preissle, 1993, p. 231).

Videotape, like the movie, is able to capture the movements involved in activities, the *how* not just the *what*. Basic aspects of human interaction can be recorded and studied in detail, including body space, continuity and change across time, and kinesic variables such as gestures and posture (Collier & Collier, 1986, p. 77). Videos can also reveal new variables and thus provide questions to be raised during later interviews (p. 79).

Another reason to use videotape is the concern that a record of research be available to observe whether the research was actually conducted in the manner described by the researcher, a concern propelled by reports of fabrication and misrepresentation of research. It is difficult, though not impossible, to falsify a video record. *Limitations of Videotape*

While videotaping offers many advantages, there are also several limitations and weakness that deserve consideration. LeCompte and Preissle (1993, p. 232) mention, for example, the difficulty of accumulating too much data that can be overwhelming for later analysis. Of course, one need not use all the data acquired; sampling from the video record is also possible.

Mehan (1979, p. 16) notes that sometimes researchers will fall short in rigor by analyzing a few video segments in considerable detail. Not only does this have the potential for misrepresenting the whole in terms of typicality or frequency, but also the relationship of the behavior to the context is not determined. There is the tendency to select evidence supporting prior assumptions or initial hypotheses (p. 20). These weaknesses are not unique to videotaping, but perhaps researchers are more prone to them with this medium. Erickson (1992, p. 210) notes that if analysis is conducted after videotaping is completely finished, there is no opportunity for testing emerging hypotheses with participants. The key to addressing this difficulty is to do much of the analysis before leaving the field. Erickson also emphasizes that important contextual details may be missing in the video record, an issue that needs to be addressed by a survey of contextual details early in the study.

Jackson (1987, p. 109-112) notes the loss of mobility and limited as to options when using videotape equipment. No machine is without its limitations; a decision to include any kind of equipment automatically excludes other kinds of data that might be available. Equipment takes attention in the field, which means less attention given to the data while recording. Equipment also costs time in maintenance and repair. Additional equipment increases the possibility of data loss and error. Videotaping researchers sometimes allow attention to drift, as they assume the tape will record all that is needed, and thus they may ignore details and nuances needed for good follow up. Therefore Jackson recommends that the researcher should use as little equipment as is needed, and gradually develop expertise in using equipment step by step. Capturing video data should not take the place of seeing; one must not examine a situation only in terms of what will produce a good picture or, as Jackson puts it, "think through the machine," but rather concentrate on the information the site and participants offer (pp. 116-117). The case can be made that an observer with a camcorder is more intrusive than an observer alone (Collier & Collier, 1986, p. 133), particularly if operated by an unskilled operator (LeCompte & Preissle, 1993, p. 232). Hostility can result if the camera is perceived as a threat, which is inadvertently encouraged by researchers who are secretive or hurried, the Colliers assert (p. 135). Some degree of intrusiveness is to be expected, at least temporarily until people become accustomed to the camera, but the greater intrusiveness of the camera can be considered a tradeoff for more and better data. There is also the advantage that with a videocamera the researcher can affirm a more precise role--that of a cameraperson (Collier & Collier, 1986, p. 22). The role of researcher is often vague and even hidden, which invites negative attributions, while the operator of a camera is a known role. When I stood alone in the school hall making notations on yellow pads of paper,

others may have been suspicious about why I watched the children so carefully, but people with cameras are expected to look carefully.

Conclusion

This books is an introductory work that hopefully can help the reader create and analyze videotapes in a productive manner. It is only introductory, and far from being the last word on the subject. Some of the topics are considered in greater detail by some of the books cited, while other issues I raise have received little or no comment in the past. There is some ongoing discussion of visual research more generally on an internet email listserv system which can be joined without cost. Sometimes some of the topics considered in this book are discussed on this interactive system. The system is abbreviated VISCOM for "Visual Communications Discussion" and you can read and participate in the dialogue by sending the message SUBSCRIBE VISCOM followed by your name to the following email address: LISTSERV@VM.TEMPLE.EDU. After you subscribe, you will receive instruction on how you can enter into the dialogue so that your comments are passed on to the 400+ current subscribers. You can also access archives of past conversations if you wish. For other advanced discussions on some of these topics, consult *Visual Anthropology*, a journal associated with the Visual Ethnography section of the American Anthropological Association, or *Visual Sociology*, which is associated with the Visual Sociology Association.

Ultimately what is written here is the product of my own experience and what I have chosen to include from the experiences of other researchers and writers. I do not pretend to offer an objective, value-free presentation of facts, but rather I have attempted to discuss to some extent most of the major issues that tend to emerge while doing research with a videocamera. I hope my ideas and those I have borrowed from others will help you in doing high quality video research, but I also realize that each person's research experience is unique and that some of these ideas will be less helpful than others.

2. PURPOSES, ETHICS, AND VISIONS

Before you enter the field to conduct videotape research, it is important to address the purposes or goals involved. Videotaping results in masses of data that can be used for many possible purposes, yet the possibilities are constrained by the site selected and the specific ways one goes about setting up and using the camera. Purposes can delimit outcomes.

The decisions prior to field entry also involve the need to consider ethical issues as they relate to the rights and concerns of participants and others involved at the field site. Concern for the purposes and ethical issues together make up the preliminary plan, or vision, for the research study conducted.

Purposes of Videotaping

To keep videotaping from becoming something other than research, it is crucial to distinguish qualitative research video from other ways of using videotape. As noted in the previous chapter, commercial video is clearly distinct in purpose from videotape recorded for research purposes; television is for entertainment, while research video is for developing understandings. While none of the sources consulted on videotaping mention it, I am impressed with some of the similarities of research video with home videos that are taken by nonprofessionals. Even one of the children in my study made this connection--one fourth grader in the hallway commented, "I know, you're gonna go home, sit on the couch, munch on stuff, and just look at it [the video]." Home video approximates research video because the purposes are often similar: to document significant events, places, and people for later viewing. Home videos are an excellent way of gaining an emic perspective of those involved, since the person doing the videotaping is almost inevitably a participant in the videotaped culture and researcher effects are

minimized. The down side, of course, is that home videos are not likely to be oriented towards the specific research interests of qualitative investigators. But perhaps there are some qualitative studies that need to be done on the question of what life events people choose for home videotaping, what subjects and events are excluded, and why these decisions are made.

Video for illustrative purposes can be distinguished from video as research data (Ball & Smith, 1992, pp. 9-12). Often photographs are ancillaries added to a primarily verbal research project as evidence for conclusions, and videotape could be used in this manner as well. The visual part of many anthropological movies has often been edited to support and illustrate the concepts described in the voice track, rather than the pictures being used as sources of data on their own. I used video data to illustrate central concepts in my dissertation research by making still photographs of children in the three social formations I found in the hallway. I tried using a 35 millimeter camera to record the three kinds of groupings I found, but children tended to pose for these pictures (I wanted natural groupings, not staged shots) or if I caught them in natural groupings, the angles tended to be less than ideal. As a result, I reviewed my notes for videotapes and found several segments that provided high quality views of the groupings I wanted, yet were naturally occurring groupings. I placed a 35 millimeter camera in front of the television screen, and turned off the color on the monitor so I could see what the black and white image for the book would look like. I also used black and white film in the 35 millimeter camera, since the dissertation would require black and white images and I did not want to lose clarity by making a black and white image from a color picture. The results were quite clear, and of almost equal quality to the still shots taken at the school.

Video may be used to document the research process. In this case, the goal is to provide evidence that the research was actually conducted or document reactivity to the researcher's presence. This was not a central purpose of videotape in my research, but it very well could be in others. I did attempt to record my own possible unconscious influences on children during the last phase of interviews with children. Without mentioning it, I placed my camcorder and tripod in a back corner of the room where I interviewed children. While I used audio cassettes to record these interviews, the addition of the camcorder was to view how my own body language may have encouraged some children to speak or encourage specific kinds of speech. I also wanted to examine the context of interviews more carefully during interviews, as well as look at some of the body language children were giving me and other children. The visual component, from across the room, was also an important means of triangulating data, which helps establish qualitative validity.

Video can also produced data for methodological decisions (Albrecht, 1985), such as the locations that reveal the most important information and which people may be optimal for interviews. In my research I ruled out interviewing sixth graders about hallway events because in the videotapes I almost never saw them mingling with the other lower grades; I suspected they would be less able to describe the whole social context as well because of this selection involvement. Video can provide rich contextual detail (Young, 1975). When this is the primary purpose for videotaping, it is probably more important to do an initial survey of the environment with the camcorder, recording details of the surroundings, then leave the camera in a peripheral position to gain the large picture of the researcher being conducted. In my research of an elementary school, I surveyed the surroundings to establish context. At first I did this with pen and pad of paper in hand, and later took the camera on a similar survey while giving verbal details. When no children were in the hallway, I walked around with the camcorder examining children's drawings on the walls, commented on architecture of the building, described colors and possible significance, and even spent time videotaping ceilings and floors while describing what I saw. It turned out that some of the details were significant in themselves, such as the older elementary hallway having fewer drawings than the early elementary wing.

Yet another purpose of videotaping is to create a stimulus to which participants respond (Krebs, 1975; Van der Does and others, 1992). This provides interviewed individuals a common reference point (Collier & Collier, 1986, p. 105; Beresin, 1993, p. 162). Collier and Collier compared discussions with and without pictorial stimuli, and found that visual stimuli were far more effective in eliciting responses than just talking. Mehan and associates played a videotape of classroom events for teachers who stopped the tape whenever an interesting event was observed (Lancy, 1993, pp.94-95). Similarly teachers were asked to

comment on their observed teaching methods in a study by Leinhardt (Lancy, 1993, p. 225). While most of my videotaping in the elementary school was intended for later detailed analysis, I copied several segments of videotape for children to view during interviews. These segments were carefully selected to portray the three social formations I found, so that the youngsters could be interviewed in detail about them to discover what meanings those groupings had for them. I attempted to use segments that included several of the children in each interview group, to help them more precisely describe their feelings as participants, as well as make it more interesting for them to talk about. Curiously, I found that the kids were more likely to talk about what was happening when they or their classmates were *not* in the video segment; when they or their friends came into view, the emphasis of comments tended to be identification of those pictured rather than discussion of what was thought and felt in the context. However, *after* the segment ended, children readily talked about thoughts and feelings about the situations, whether they were pictured or not.

When visual media are used as a stimulus for participants' responses, it is important to begin with the formal and public and later, after sufficient trust is established, move to the informal and private (Collier & Collier, 1986, p. 27). Photographing things most prized by those studied conveys admiration and appreciation, then with time greater tolerance will be given for the researcher's choice of pictures. A variation of using video as a stimulus for participants is to use video segments as part of a member check (Lincoln & Guba, 1985, pp. 314-316), asking if the researcher's constructs and hypotheses fit with participants' ideas of the situation, as they watch videotape segments that relate to those constructs and hypotheses. Beresin (1993, p. 23) used videotape segments to obtain teacher reactions to her study of children at recess, an interesting variation of the member check.

An additional purpose for videotaping is for training (Pellegrini, in press, p. 273; Patton, 1990, p. 247; Hockings, 1975). For example, in a brief study of children on the playground, I videotaped the participants in the research for college students who would later code their behavior. This was done to help the student coders quickly identify children in the playground context, where they would later do the coding. I also recorded examples of the various behaviors to be coded, again as exemplified on the playground where the coders would do their work and with the specific children they would be coding. Thus the purpose of the videotape was teaching student coders the requirements of their task.

Analysis by several people is also possible using videotapes (Schaeffer, 1975). In my dissertation study, I used video segments to show several members of my dissertation committee what I was observing during the process of doing my research. These "update" meetings were valuable sources of feedback on what I was doing, and the videotapes provided examples of what I was attempting to do. After watching several video segments, committee members made a number of suggestions that helped me better focus the study as well as examine other details.

Videotapes can be made specifically to illustrate concepts for use in a classroom (Hockings, 1975). This could be done on an individual basis, or could involve making professional videos for more general use. The latter is coming close to a classic use of visual data in anthropology: ethnographic film and documentary, which is often carefully edited to present a specific analysis to those outside the study, rather than using the visual information for data analysis (Rollwagon, 1989, 1993; McDonald, 1989; Nichols, 1991; Hyatt, 1992). Sandall (1975) similarly contrasts the "documentary film" with the "film document." The permission requirements are more stringent when videos are intended for general use, even in a single classroom of the person who did the videotaping. Videotapes could also be used by students doing assignments--a videotape segment of children in the classroom, for example, could be analyzed for examples of Piaget's constructs. While some visual researchers emphasize video as data source as the most important area to consider (Mead, 1975; Brigard, 1975; Jacknis, 1988), I also want to affirm the other alternative uses for videotape work. Video can be used to illustrate written analysis, although I think it is also worthwhile to take it a step further as a separate source of data by which other observations can be triangulated. Videotapes for classroom or public consumption can also be very worthwhile, and I have profited from such productions [one of my favorites is the PBS special "Nomads of the Rainforest"].

For this book, the emphases will be on videotape as providing data and as a means of obtaining data from participants. The camcorder is a tool of indispensable value, but it is only a tool that helps record

what the observer sees. Video recording is always a means to an end, machinery that is in the service of the researcher (Collier & Collier, 1986, p. 5; Jackson, 1987, p. 108).

Participant or Distant Observer: Emic or Etic?

Important recent trends in videotape research are the inclusion of participants' perspectives in what is recorded, and sometimes even asking research participants to do videotaping (Collier & Collier, 1986, p 157). The goal is to gain an emic perspective, to attempt to record the opinions and values of participants. While I did not have the children do videotaping in my research, I did have them conduct interviews with one another as they led me throughout the school, as I carried my running camcorder on my shoulder. They took the microphone in hand, which was connected to a cassette recorder which I also had strapped to my shoulder, and did a series of interviews of one another as we stopped at locations of their choosing throughout the school. While this exercise in children directing the context and content of interviews met with disappointing results, it is potentially a valuable means of gaining information with adults and perhaps children as well if they are given adequate preparation. Perhaps forming good questions could be part of the preparation one asks of participants who take the lead in such interviews.

In considering all these possible purposes for videotaping, a central issue is that of perspective: Is it better to stay etic, uninvolved and distant, or should one attempt a more emic perspective? Setting the camera in a corner and letting it run without adjustment represents a more extreme etic perspective, while turning the camera and making adjustments to follow specific events and people makes it a bit less etic. An even more emic perspective is possible by carrying the camera on the shoulder or in the hands, so that it becomes an extension of the participant observer holding the camera.

A number of writers recommend the more distanced approach to videotaping. Erickson (1992, pp. 214-215; Mead, 1975) emphasizes the importance of consistent visual framing, with few adjustments and movements of the camera, run for lengthy periods of time, particularly during the initial stages of research. This allows one segment to be more comparable to another. In contrast, Collier and Collier (1986, p. 148) believe that continuous video segments produce many wasted segments and often have inferior angles and framing. Cameras need to move, adjusting to contextual changes by panning, using closeups, and turning on and off regularly. This may be termed "participating cinema" (McDougall, 1975). I believe there is value in both perspectives, both the distanced, stationary, long running wide angle overview as well as the mobile, involved approach that zooms in and out regularly. Each of these approaches will provide data the other can miss.

When carrying around the camcorder as it records, the camera becomes a co-participant observer. Children sometimes treated the camera as a separate person when I carried it, as when one child waved and said "Hi, camera!" Yet the camera and I were more often considered a unit.

When I first began carrying the camera while videotaping, I expected a significant rise in reactivity because I was moving the camera, but I found there was little more than when the camera was on the tripod. Perhaps the children had habituated to the camera wherever it was since I had moved the position of the tripod so many times. I was able to actively discourage reactivity by turning the camera to something else when I observed a child acting for the camera. On the other hand I found children asking for more details about why I was there once I began carrying the camera; my field notes record that the most detailed discussion of what I was doing was on the first day I carried the camera while recording.

It is important to emphasize that the distinction between participant and non-participant, emic and etic, is one of degree not kind. No one is entirely etic and uninvolved, because the researcher is present and has some influence as a result. The scientific ideal of objectivity is impossible to reach because of latent and manifest values and biases. But no one is perfectly emic either; one can never capture all of a person's perspective or cultural view. But we do choose to be participants or relatively uninvolved in what is observed; the camera either watches from afar or in a more involved manner. One can be a "fly on the wall" (Young, 1975), watching from afar, or one can observe from within, using those wings to soar through the

group. I see value in both etic and emic perspectives, and various blends between the two. I used a more etic view of the school hallway during the earliest phases of my research, setting the camera in a corner so it could view the totality of the social context. I varied the placement of the camera from time to time, but the camcorder and I were relatively uninvolved in the situation. Later I began moving the camera on the tripod, following what I thought were important events and people. I became a bit less etic because of the emphasis on specifics. I was a bit more involved with what occurred. Still later I began moving the tripod every few minutes, and eventually hoisted the camera on my shoulder as I walked down the hallway viewing different events and people. I was a participant in the school hallway context, more emic than etic. Yet, even as a participant, I was still somewhat etic: I was neither child, teacher, parent, nor school official. I was a cameraperson, a distinctive role not indigenous to the school culture.

Which perspective, observer or participant, provided the best data? Each had its value and limitations. The distanced approach at first helped me see the context more fully so I would enter it with some ideas of what was important. By beginning in a more etic manner, I did not gain a sense of what it was like to be a participant, I lacked an insider view of what I observed through the lens. When I began moving the camera, and especially when I carried the camcorder on my shoulder, I learned a bit more of what it was like to be a participant. I could quickly change the angle to observe events more completely. But I lost the big picture that included surrounding events. Later when I watched these videos, I sometimes wanted to follow other events and people than what I videotaped. I could not because the decisions made as a participant could not be reversed. Fortunately I could return to earlier videotapes of similar events when I was not as involved, to observe these other events. There is value in both the etic and emic, in both participating and not participating. Indeed the two are complementary, and together give a bigger picture of the whole. *The Ethics of Videotaping*

Many ethical issues are involved in doing videotape research. Perhaps most basic are those concerns that institutional review committees consider, and this is an important aspect of the research process that can help protect those being studied, as well as the researcher.

Does the location make a difference in what kind of permission is given to videotape? Videotapes of public situations generally do not legally require permission of individual participants. Commercial television, for example, can photograph public events with people standing nearby, without gaining the permission of those photographed. The question, however, is what situations are public? In my research, I asked myself is an elementary school hallway, cafeteria, or playground a public situation? In a sense, they all are public because many different people are involved, both adults and children. Yet there are restrictions to access; most schools do not permit just anyone to enter the school at any time of the day. Other locations may have access issues as well, but does public access automatically mean permission to videotape is not needed? I think permission is still needed, most obviously when interviews are desired, but in many other relatively public situations as well. For example, sometimes television crews enter public situations of tragedy and conduct interviews. While consent may be implied by the fact that people make statements, it is difficult to consider this completely voluntary consent because of the nature of the situation and the emotions involvement that may preclude full rationality. It may be legal, but is it ethical?

Some researchers, such as Raymond (1991), have begun to wonder if tighter restrictions are needed on videotaped data than in the past. He particularly questions the use of videotaped data after the completion of research, without the permission of those participating. Participants often fear the embarrassment of their activities being exposed to supervisors. Thus Erickson (1992, p. 211) recommends that they be given assurances that access to videotapes will be strictly limited. Confidentiality is also an issue because of the possibility of discipline by those who administrate the social situation. Erickson also emphasizes that legal proceedings can result from not limiting access to videotapes. I think a researcher needs to be careful not to make assurances to participants that are at best uncertain; videotapes can and are subpoenaed for legal proceedings.

Videos should be stored in a manner that protects confidentiality (Schaeffer, 1975). Erickson (p. 213) encourages storing videotapes by retrieval codes rather than site names and names of participants. This is also a good idea for filing notes in a file cabinet or in computer files. Schaeffer also recommends

that participants be able to review and even destroy videos, if complete confidentiality is not possible. Seaman and Williams (1992) believe that in the future confidentiality will be more easily maintained by computer alterations of video data, such as distorting facial features.

Visions for Videotaping

Underscoring data collection as the primary purpose for videotaping, making decisions about the level or levels of involvement in the social context, and establishing a strong ethical context, all make up what I call the vision for videotape research. Having a well thought out vision prepares you for those foreboding initial days of research. In the planning process for videotape research, and when using theories to help orient a research study, it is imperative to keep an attitude of openness. Videotape data is incredibly rich, as dozens and even hundreds of kinds of data can be included simultaneously. One photograph of a street scene, for example, could be analyzed for the buildings included, the groupings of people, the vehicles seen, the sidewalk, the traffic lights, and so on. Videotape adds motion elements, thus time and process are more fully recorded than can be accomplished with still photographs. All the different kinds of data that can be analyzed in a photograph are multiplied by these additional elements of process and time. It is important to let the data push you to certain conclusions, and this is more likely to occur when multiple options and multiple perspectives are employed. Multiplicity in perspectives and choices match the vast amount of detail possible in video research. When I was asked to describe my orienting theories in the prospectus for my dissertation, I purposefully chose several theoretical frameworks to allow more directions in which to go with the data, and I also chose theories that were themselves more general and open ended. I used Edward T. Hall's ideas of situation frames and event chains because these concepts emphasize linkages without prescribing any specific kinds of relationships between components. It was a delightfully open (some would say vague) approach to data. I also used symbolic interactionist theory because, again, the wide variety of video data could be explained in many different ways with this theoretical position. Ball and Smith (1992) describe in detail how content analysis, symbolic analysis, and structuralist theories can be particularly appropriate for the study of visual data. I agree, as these are similarly broad and inclusive approaches. The theories that inform a study delimit topics and directions, but they can also open many different alternatives; theories establish the kinds of questions that are examined (Ball & Smith, 1992, p. 3). Most, if not all, funding sources and many doctoral committees require a strong theoretical orientation in the prospectus, and one way of accomplishing this is to use broad-based theories.

Even more crucial, and delimiting, is the selection of a topic. Again, I attempted to maintain an openness in this area as well by listing dozens of possible topics and subtopics that could be explored in the selected context of my study and the varieties of research strategies desired. I made it clear in my prospectus that I did not intend to study all the subjects listed, but rather I was providing a sample of potential subjects that might be considered. Most crucial was how suitable the site would be for exploring these topics (did those things occur at the site?), as well as how well the topics fit with videotaping (could I effectively tape data related to those topics?). I also encouraged flexibility in the choices of topics and methods by allowing for changes in my plan with the permission of the two co-chairs of my dissertation committee.

I believe that flexibility in research design, theory, and topics is crucial in qualitative research. This is especially important at the beginning of research, so that the most important issues will be included, whether foreseen or not. One can make the case that the unknown and unforeseeable aspects of using videotape in a research situation makes this guideline even more imperative.

3. NEEDED: THE RIGHT STUFF

Once the potential design/s, purposes, and topics for videotape research are determined in an ethically sound manner, specific preparations for videotaping can take place. There are important decisions

to prepare for the process of videotaping, although many of the decisions may need to be deferred, reconsidered, and even reversed once in the research context.

The decisions made regarding the choice and uses of videotaping equipment inevitably influence the outcomes. Videotaping is inherently an interpretive process. One chooses certain angles and thus excludes others, but even deciding to take a broad, encompassing view is also interpretive since this implies holism as well as a distanced, etic perspective. Focusing on some objects requires that others be out of focus, and zooming in on some things requires that other things on the periphery are excluded (Young, 1975). These are all interpretive decisions that are based on what is important to the researcher, while another researcher could very well make quite different decisions as to what is important. The choices made reflect the video taper's constructions of social reality, which is powerfully influenced by political orientation (Suchar, 1991; Caulfield, 1991) as well as social class, ethnicity, and gender (Chalfen, 1989).

Even the same researcher can have a different interpretation at a second point in time. For example, during one phase of my research I attempted to spot every cluster of children and would turn to that kind of grouping whenever it occurred, regardless of what else I was observing. Several months later, after the fieldwork was completed, I again observed the tape and tried to time the durations of other kinds of groupings. Of course, the priority given to clusters during the videotaping meant that many segments of other groupings were interrupted as the camera was turned to a cluster. This occurred countless times, and was very frustrating. The earlier, broad stationary segments were also not very helpful as groupings often walked out of the camera's angle of vision. Clearly the camcorder is limited in its ability to record all aspects of a phenomenon; it always presents a single perspective (Mehan, 1982).

Choosing Equipment

To produce good videotape research, the choice of good videotape equipment is crucial. Whether the equipment is purchased, leased, or borrowed, it is imperative that the equipment meet the demands of the research context. Contexts vary a great deal, and thus the specific decisions made must be tailored to your unique situation. Yet several guidelines can be suggested that can help in the choices made. In this chapter visually oriented equipment will be considered, while I will examine the choice of microphones in chapter five. It is important to consult a reliable source on the quality of available equipment. For this book I used my own experience, that of a colleague who teaches television, and the most recent *Consumer Reports* evaluation (July, 1995 at this writing). But there is nothing that compares with personally trying out several different kinds of equipment personally and discovering what works best for your specific research needs.

Is it feasible to have more than one camcorder? Jackson (1987, pp. 114-115) describes using teams of researchers who collaborate in a study. However, he notes that sometimes adding more people creates new difficulties that may outweigh possible gains. As more researchers enter a site, the social context is more and more likely to change in significant ways. He concludes that collaboration can be a nightmare. It can also be very expensive (Rouch, 1975). In my study I was assisted on several occasions by one of my students, but on only one or two occasions were we at the research site at the same time. I believe the problems Jackson describes are probably related to numerous researchers on location at the same time.

I recall dreaming of having two or more cameras suspended from the ceiling of the hallway I studied, facing in opposite directions, so that I could see the continuation of activity when a person left the visual field of the first camera. That could be an option in some circumstances, as multiple cameras could capture more data and even result in some triangulation of data because of the differences in vantage points. Using more than one camera presents the question of how to record the data on tape. One option is to have two videotapes recording simultaneously, one in each camera. Beresin (1993, p. 11) used this method in videotaping a playground, with one camera on the playground and another in a second floor window of the school. She began with the second floor camera and added the playground camcorder only after sufficient trust had been established by her regular presence on the playground (p. 161).

Combining the two signals from two video cameras can be accomplished by using a video mixer or switch, although this requires someone to watch two screens and switch a single videorecorder between the two cameras when targeted activities change from the visual field of one camera to the other. In this case, the switching would be permanent, and if one later decided that other events were more important than the one the switcher decides to follow, the data would be violated by the possibly irrelevant switching. Another option is a somewhat more expensive video mixer, which would allow more than one image on the screen at one time. The difficulty here is that resolution or clarity is lost when an image is smaller on the screen, possibly resulting in data that is less useful. Multiple cameras means greater expense either for switches, mixers, or multiple tapes, and greater complexity for setting up and running equipment. I am sure multiple cameras can work well in some situations, as when the activities recorded do not reoccur regularly, but there are significant trade offs for this approach. Perhaps the complexity and expense of multiple cameras will be resolved by future innovations in video technology; switching between camera records could occur after the fact using hypermedia technology (see chapter six).

In my study I only used one camera at a time, varying positions from day to day and later varying angles by following data and using the zoom lens. This resulted in data similar to what multiple cameras could accomplish, without the expense and complexity. I did use two cameras at one point in my study, however. At the conclusion of my interviews, when I had the children interview one another in the hallway, I also had my assistant videotape me from a distance as I videotaped the kids. Again, my goal was to see what the videotaped hallway interviews looked like to the kids and outsiders, for methodological examination. Another approach is for the researcher to use a second person as cameraperson, with the camera being cued by the research (Lancy, 1993, p. 69). The most important differences between camcorders today are the features available, not the brand name on the outside. The old adage that more money results in better quality is not always relevant; very good research is possible using some of the lowest cost equipment. Special circumstances may require distinctive equipment and unusual features, but a standard camcorder will record sufficient data in most contexts.

As this is written, three formats are predominant: the standard VHS, the smaller VHS-C, and eight millimeter models. There are also premium variations of the latter two known as S-VHS-C and Hi8, although the difference in clarity between these and the cheaper formats is insignificant unless you need to examine very fine details, and you will need an extraordinary screen to see those details. The reel-to-reel video recorders of the 1970's are long gone, as is the short-lived Beta format, and the U-Matic format is almost exclusively used in broadcasting. Which of the available formats is best for qualitative research?

I used a standard VHS camcorder in my research. VHS is very reasonably priced and produces very good quality results compared with the other two formats. It also can record for two hours without changing the tape, compared with only a half hour or so with the others when run at standard speed. At this writing, videotapes for VHS are much less expensive than for the other two formats and, at least in rural areas, are much more readily available. The downside to VHS is that the camcorder must be larger to accommodate the larger tape, and carrying around a large camcorder for more than a few minutes can be extremely tiring. My videotape assistant used the VHS-C format, and every day or two we copied her tapes onto a VHS videorecorder. This kept us from going bankrupt with the cost of VHS-C tapes, but whenever you copy a tape you get a poorer copy than the original, unless you copy to videodisk. In our situation the decrease in quality was not significant. Some of the VHS-C and eight millimeter cameras allow you to record at a slower speed so that a tape will last a longer amount of time. But slower speeds always mean poorer quality images. Another difference in cameras is the viewfinder. Is the more expensive color viewfinder better than the black and white variety? I found that the black and white image of my camcorder was not very predictive of the color results on the monitor at home. Fortunately, the black and white image on the viewfinder tended to underpredict good pictures; the color monitor brought out some details I thought were lost. As a result I spent some time making adjustments to the camera that were unnecessary--what looked poor in the viewfinder sometimes turned out quite good on the color screen. The down side of this is that something could look poor in black and white and be poor in color as well. So all things being equal, I would opt for the color viewfinder, but good data can result from a black and white viewfinder as well. Another distinction is the standard small, one eye viewfinder and the newer three inch screen that some more expensive models have. For seeing what you are getting, and for the convenience of holding the

camera on your lap, the screen models can be an advantage. Yet the monitor screen can also increase reactivity as the image that is so accessible to you is also easily accessed by others standing nearby. The three inch screen may significantly interfere with obtaining data, although I must admit that a number of children stopped and looked into my tiny viewfinder as well. Perhaps the smaller viewfinder discourages some of this reactivity. On some camcorders with the smaller viewfinder, the cover glass can be removed so that the tiny screen can be seen from a distance of about a foot, which is suitable for watching while holding the camera in the lap and is a bit easier to use for those of us with glasses (Collier & Collier, 1986, p. 212).

One feature I think is essential is an on-screen date and time generator. These are almost universally included in camcorders, but you will need to learn how to set them and turn them on. If possible, get a time generator that includes seconds so that events recorded can be easily located and compared. Ideally try to find a camcorder that records date and time in small numbers, preferably in a corner of the screen rather than at the bottom to minimize the loss of data in that section. A few cameras can also generate letters. I do not believe this is necessary as you will want to keep a separate log of contextual details that can be matched by time notations on the log and videotape, and written comments on the video take valuable screen space where data may be needed. In chapter seven computer programs will be described that allow you to enter log notations and other field notes into the computer so that the notes and video segments coincide, yet without loss of screen data. Someday perhaps camcorders will record the exact time nonvisually on the tape, instead of taking valuable screen space. Remote controls may be helpful in some situations and not others. For example, if you plan to set the camcorder in the corner of the room unattended for long periods of time, or conversely if you plan to carry it around all the time, a remote control may be a waste of money. Controls to increase the shutter speed so that playback will be in slow motion can be very helpful if you are doing event analysis involving high speed movements, but this feature is useless for other research. You can do frame-by-frame analysis with any camera since the analysis uses a playback videotape recorder; the high speed cameras simply give you more frames per second to analyze. For most situations, 30 frames a second (the standard number for videotape) are more than enough to analyze! There are many other features that are available on camcorders, some of which will be considered later in this chapter. What is important to remember is to determine which will be needed in your research and not buy features you do not need. It is important to become familiar with different features, perhaps with the help of a knowledgeable salesperson who will describe rather than just sell the bells and whistles, then you can decide which you need and which you do not. The more features, the more there is to break down! Videotapes are an important aspect of videotaping; your video data is no better than the tape you use. However, the differences between kinds of videotape are rather minor and not always associated with a particular brand name or described quality. Sometimes standard high quality outperforms extra high quality tape even with the same brand name! But *do* use some well-known brand name; less familiar, cheaper brands can be second rate tapes manufactured but rejected by a name brand company. I suggest consulting the latest evaluation of videotapes by *Consumer Reports* and purchasing the lowest cost recommended variety in bulk.

At this writing, there are several extra-length tapes available that may be tempting for some qualitative research situations where the camcorder is unattended for long periods of time. One of the problems with extra-long tape (beyond two hours for standard VHS at regular speed) is that the tape is thinner and is therefore more likely to stretch. Even tiny amounts of stretching can distort the accuracy of time equivalence. Even worse is the experience I have had of seeing valuable data stretched or crumpled into an unusable mess. This also can happen due to defective equipment. Videotapes also break, but can sometimes be repaired with considerable effort.

It is important to remember that videotape has a limited life expectancy. Under normal conditions of storage videotape can only be expected to last about ten years before it deteriorates and becomes unusable, and this can be significantly shortened if the tape is used extensively or if it is stored under conditions of extreme cold or heat (Jackson, 1987, p. 119). Sometimes a good tape will last longer than this, but do not count on it. Be sure to avoid magnetic fields, which can erase or distort videotape data. Most of these problems are inherent in the tape format; eliminating them in the future will probably require the invention of a new video recording format.

One last recommendation regarding videotape. Be sure to order a sufficient number of tapes, and if you are going to copy the tape for analysis (recommended unless you are copying to videodisk), multiply the number needed by two.

Do you need a tripod? In most cases, the answer is yes. A tripod holds the camera in position, essential for nonparticipant observation kinds of recording, but also smooths camera movement if the camera pans to follow specific people or events. I found that when I carried the camera around, so that it became more or less a co-participant with me, I still wanted to set it down occasionally to rest my shoulder. I could place it on the tripod without stopping the camcorder--to avoid loss of data--and sometimes held it in my arms or on my lap, continuing to watch the viewfinder to be sure it was taping relevant information.

There are many kinds of tripods available, at widely varying prices. I recommend purchasing a heavy model so it will securely hold the camcorder. Find a tripod that is tall prior to extending the section that holds the camcorder; in other words, the height should be more from legs than from the camcorder support section, since an extended top stem makes the tripod more likely to tip over. Obtain a tripod built for a camcorder, not for a still camera which is much lighter and not as rugged as is needed for videotaping. It is also important that the top of the tripod swivel smoothly with the camcorder on it (Collier & Collier, 1986, p. 222). Jerky movements due to a poor quality tripod head will distort and even lose data. For qualitative research, it is imperative that the tripod be able to move quickly as well as smoothly; television productions rarely require quick movement, but qualitative research may need this fairly often to follow an activity or capture an event in an unexpected direction. Batteries are an important consideration in preparing for qualitative research. Be sure to purchase a long-lasting battery, providing at least two hours of operation with each charge. I strongly recommend purchasing an extra battery so that one can be charging while the other is used. It may even be wise to have a third battery on hand, as sometimes replacements may be difficult to find on short notice. Battery life decreases with age and use, and you may want to consider activating the battery meter in the viewfinder to monitor its condition. What could be worse than the camera unexpectedly grinding to a halt i the middle of an important event? I was able to use one battery alternating with a connection to an electrical outlet. But I found the juggling of these two sources of power, as well as the need to charge batteries at the site, a bit unwieldy at times. Batteries being charged run the risk of being stolen, and electrical outlets are not always where they are needed. An extension cord may produce unnecessary changes in the environment, and are something else that can go wrong. Buy a spare battery!

By the way, if you are videotaping outside the United States, be sure to check the electrical current for the battery charger and the plug connecting the camcorder to the wall outlet. Plugging a 120 volt power supply into a 220 volt line is definitely not recommended! Inexpensive transformers are usually available to convert the power down. In many countries, regardless of the voltage, it is a good idea to add a high quality surge protector/battery power backup system. These currently cost less than $100. Camcorders are generally more resistant to line surges than computers, but the wide variation in voltages and power levels, as well as unpredictable blackouts, in some countries make the surge protector/backup a necessity.

Connecting wires are vital to good recording, but these are usually included with the camcorder. Wires should have thick coverings to protect connections, and substantial connectors that won't quickly wear out from connecting and disconnecting. Connectors wear out more quickly than wires in most cases, and breaks in the wire are usually near the connections. Perhaps the best recommendation here is to take care of the connecting wires you have by not twisting or stretching them, and don't excessively tighten connections. Always plug and unplug holding the connectors, never the wires. When coiling the wire at the end of the day, don't make bends too tight. Don't allow cords to be run over or yanked. If you take care of cords, they are less likely to need replacement.

Should you purchase and use a good cleaning tape for the camcorder? This is a question that is not as easily answered as might be thought. Cleaning tapes are used to remove the residue left by videotapes on the recording heads of camcorders and videotape players. The build up of residue can introduce video "noise" and decrease clarity of sound. Yet my colleague who teaches videotaping for television broadcasting tells me cleaning is rarely if ever needed on camcorders if extra high quality videotapes are used. Occasional use of a cleaning tape should not hurt anything, but perhaps even more important is using

brand name tapes of high quality. If you begin seeing lines across the screen upon playback or other problems, first try adjusting the tracking on the playback unit, then clean the heads of the playback unit, and finally clean the camcorder heads.

If you plan to do data analysis using the playback unit and not by using a videodisk copy, the choice of videorecorder or videoplayer used for playback is as important if not more so than the camcorder. Features should be checked against the specific requirements of the research analysis. Especially check the still frame, slow motion, fast forward scan and rewind scan, as these are extremely important in finding specific segments for analysis. Look for video "noise" in which lines, static, or other kinds of interference obscure part or all of the screen during these modes (Collier & Collier, 1986, p. 221). In general, more expensive videoplayers are better at displaying stills and slow motion, but check before you decide! If you are only using the playback unit to copy the tape to videodisk, it is still important that it be in good condition (be sure the playback heads are clean) so that the transfer will be optimal. I will consider the issue of high fidelity and stereo sound in a VCR in chapter five. Fairly good viewing is possible by playing the tape through a standard television, but even better quality is possible by using a monitor that can be directly connected by audio-type wires rather than antenna cable (Collier & Collier, 1986, p. 221). Expensive monitors provide better detail.

If you will be recording video in extreme cold, a heated cover may be required for the camcorder and batteries (Collier & Collier, 1986, p. 230). If you move from very cold weather to a warm location, water condensation can occur inside the camera and tapes which will result in operation failure. Many camcorders automatically sense this condition, activate a "dew" light and become inoperative until the condensation is gone. The best way to avoid condensation is to gradually increase the temperature of the camera when moving from cold to warm contexts. Collier and Collier also note that extreme heat, such as can be found in deserts, the tropics, or a closed car in direct sunlight, also produces problems with batteries, cameras, and videotapes.

Beware of taking too much equipment to the site, thereby hindering your mobility. Jackson (1987, p. 115) suggests that equipment be limited to a shoulder bag. I took a bit more equipment than that, but limited myself to what could be carried in a single trip from the car to the school.

Preparations for videotaping are as important as the actual process of videotaping. Thinking through what is needed and how it will be used is imperative in obtaining high quality video data.

4. THE MECHANICS AND ART OF VIDEOTAPING

Videotaping is an artistic process used with mechanical devices. Because it is an art, many decisions cannot be anticipated but emerge in the research context, or are discovered through trial and error. The artistic aspects of videotaping emphasize how video, like any medium of communication, reflects some of the values and personal aspects of the researcher as she or he uses the machinery of recording. Again, an attitude of openness is imperative when it comes to these decisions. *Setting Up*

In most qualitative research situations, you will probably need to set up your camcorder and associated wires each day. It is important to establish a procedure for setting up equipment so that it is minimally distracting to the social context and yet not time consuming. Familiarity with the equipment prior to beginning the research will help in establishing set up routines.

An important book to read in preparing for qualitative videotape research is the camcorder manual. The manual gives needed details on how to use various functions of the camera, and many frustrations can be avoided by a carefully reading. As you read the manual, think about possible set up procedures as well as the actual process of videotaping research data.

It is also important to spend time getting to know your camcorder thoroughly before beginning research. While features such as the zoom lens require practice before proficiency is acquired, you also need to run through the set up and take down procedures a number of times. As you practice, think about the impact setting up can have on the social context. Learn how to load and unload the batteries and tapes quickly and efficiently without creating distracting noises and actions. Set the camcorder clock using time cues in the field rather than actual time; for example I set my clock and watch by the school bell. Be sure the clock is set so that the *change* in digits is coordinated with time cues, not just the digits themselves. Camcorder clocks and your watch will probably need to be recoordinated once every week or two. Practice using some of the features and controls you think you need in your study; you can never predict what might unexpectedly be needed.

Also practice using the tripod, so that you know what *all* the levers and knobs do, and how to use the lock screws. You will probably find you want to leave the lock screw for horizontal panning loose, but tighten the other lock screws. With practice most tripods allow you to remove or replace the camera in two to five seconds.

I developed a list of steps I used in setting up and taking down the tripod, wires, and camcorder so that I would not forget anything. Your list may very well be different, but you might include:

1. Charged battery installed

2. Lens clean [use special lens paper for cleaning]

3. Lens cap placed in shirt pocket [if the lens is tied to the camcorder, disconnect the string; dangling lens caps are distracting]

4. Fresh tape not broken, installed in camcorder, tested

5. Camcorder meters and clock working and turned on

6. Zoom and focus adjustment motors working, switch for recording working

7. Tripod legs extended, locked, and stable (if using tripod)

8. Tripod pans smoothly, camera securely attached (if using tripod)

9. Battery charger and outlet operational (if used in field)

10. Cords in good condition and out of the way

11. All needed accessories readily available.

When setting up, keep cords, additional tapes, battery chargers, and accessories nearby for immediate access. In my study, at first I kept these immediately under my tripod so I could easily reach them when needed, but also to keep them out of people's way and discourage pranksters from disconnecting the cables. Later, when I was mobile with the camcorder, I left everything else needed in the car (with the windows down to avoid excessive heat) or in the teachers' lounge. *The Early Days*

The beginning of a research study is sometimes a ominous event, as the researcher may wonder where the data will lead, or even if the data will be obtainable or usable once it is obtained. This fear can be counterproductive if it paralyzes, but can be helpful if it makes the researcher more cautions about too quickly making decisions that will truncate the work by delimiting ideas too soon. Videotape is distinctly helpful in the process of beginning research as it helps speed up entry and orientation to the field. The

initial impressions of the research site are important to record, and videotape can help preserve these. Video can also help orient the newcomer by surveying the environment (Collier & Collier, 1986, p. 16). Such practical skills as learning the names of people are possible through visual media (p. 20).

Planning ahead is important for the early days of videotaping to be maximal effective. Think ahead about camera positions and angles by using maps and diagrams. You will not be able to anticipate everything, of course. In my research what turned out to be the best location for the camera was not even considered an option in my initial plans.

Collier and Collier (1986, pp. 29-62) encourage mapping and surveying the area surrounding the research site during the initial stage of video research, and making a cultural inventory of the site. The cultural inventory includes the groupings of objects and use of space which reflects values and feelings. Six specific components of an inventory are described: 1) economic conditions and reflections of the degree of value placed on material wealth, 2) culture oriented styles of homes, furniture, and community names, 3) decorations reflecting values and identities, 4) activities implied by objects, such as crafts, recreational and sports equipment, music, literature, and foods, 5) degree of orderliness of objects and associated meanings of that order, and 6) degree of hospitality. Such an inventory is very amenable to videotaping, and can be a very useful way of establishing rapport, particularly if those studied direct the video inventory. The cultural inventory is supplemented with other contextual information such as names and identities of people, sequences of events and actions, proximity in spacings of people, and other setting characteristics (p. 163). These provide surface details that are the framework for ascertaining deeper levels of significance and meaning (Manning, 1987, p. 46).

Be prepared for participants' concern and interest in the camera, and questions about your purpose and plans. I have not counted, but I know I was asked several hundred times "What ya doin'?" by interested children during my study. Eventually most people come to ignore the camcorder. However, some people may continue to give the camera attention, as did a few children in my study who enjoyed making faces in the camera. I decided to maximize reactivity for a day by providing a monitor for children to watch themselves, with the hope that this would satisfy their curiosity and help them ignore the camera in the future. My experiment did not work; a select few continued to make faces to the very end of my research study! I did discover, as I examined reactive influences, that children tend to perform for the camera more often when with peers than when alone. I also found that there were *zones of visual reactivity*, with reactive influences being more likely as children are closer to the camera and less likely the more they moved off axis from the direction of the camera lens.

The initial days are important, but it is more likely the data will be unusual because of reactivity effects. While some researchers suggest that the video data from initial days of research is irrelevant--Collier and Collier (1986, p. 142) even suggest that no tape be used--I disagree. It is important to document early reactivity not only because the decrease with time is itself worthy of study, but also to help establish validity by the evidence of lower levels of reactivity. Comparisons in people's reactions also can be made; McCarty (1975) mentions that early reactions to the camera can reveal a great deal about participants. Later on I found that reactivity was least likely when people's backs were to the camera, but unfortunately the camera cannot record important facial messages from this angle.

One of the dangers during the early days of research is the tendency to write fewer field notes when videotaping begins. I noticed in my own research that when I began videotaping I began relying on the camera to obtain data and made fewer field notes. The danger in this is the risk of losing all data for the day if the camera or tape malfunctions. In addition, taking notes helps fill in contextual detail that the camera can miss because of the angle of vision used or insufficient resolution. Particularly if the camera is stationary, it is important to keep good written notes.

Collier and Collier (1986, pp. 161-162) recommend that early videotaping begin with convenient locations and obvious objects and events. Researchers can follow the obvious to see where the "cultural rope" that links one event to another leads them. Attempting to capture everything is impossible, the Colliers emphasize, so the goal is to find interrelationships that produce a trustworthy view of the whole

situation. First impressions of the research site are particularly valuable in producing important insights and new questions (p. 168). Sorenson and Jablonko (1975) describe three kinds of video sampling methods that may prove useful early in research. *Opportunistic sampling* involves recording interesting events that are not anticipated. In contrast *programmed sampling* uses a predetermined plan for videotaping, a plan that may be either simple or complex. Third, the *digressive search* deliberately seeks areas beyond current concepts and inclinations of the researcher, identifying and analyzing peripheral areas. *Tips for Making Good Videotapes*

A wide variety of guidelines and options are possible in making usable research videotapes. These are by no means exhaustive or definitive; some and perhaps many of my perspectives could be challenged. However, these ideas are places to begin in examining aspects of video recording. One caution: there are many things to learn about videotaping, and no one can master them entirely. Everyone who does research with videotape can learn from their mistakes, but just as important is the ability to learn why mistakes were made and to discover what the mistakes cost you in the data collected (Jackson, 1987, p. 108). Lighting is important in recording videotape. Color accuracy varies from camcorder to camcorder. If small variations in color are important in your study, this is an important consideration in making a camcorder decision. The amount of light available is also a consideration, although most newer camcorders record remarkably well in low light conditions. When lighting is very low, colors tend to fade and you may end up with virtually black and white images (Collier & Collier, 1986, p. 222). While this may be unsatisfactory for commercial video, it may still produce good data for qualitative research. In some situations black and white pictures may even be preferable to color for qualitative analysis, as hiding color differences may result in the accentuation of broader patterns of action and contrast. The best way to obtain black and white videos is to record in color and turn off the color control on the monitor when you play back the videotape; don't try to record in black and white.

In other cases, though, lighting may be central to the purposes of research, and more expensive low light cameras may need to be considered. Dark spots at the research site may not be perceived with the naked eye but may be clearly visible on videotape. The latter differences in light were clearly visible in my hallway research videos because of the presence of recessed ceiling lights at regular intervals. The extra high quality videotape formats tend to do more poorly in low light conditions at the present level of technology.

The screen attached to the playback machine may need adjustments for good color reproduction. Objects have different colors with inside artificial light and outside natural light. The human eye automatically compensates for these differences, and many camcorders do as well, but occasionally you will find shots where the compensation is not adequate such as when some natural light comes through the window of an artificially lit room. If color is central to your study, it may be helpful to include a color chart photographed at the location of your study under normal lighting conditions (Jackson, 1987, pp. 126-127).

Another issue in lighting is the exposure. Nearly all camcorders automatically adjust the lens opening to available light, and this may produce acceptable results in many situations. However, sometimes there may be a backlight problem where bright light from a light fixture or from a window results in the camera shutting the lens too much so that you cannot see what is desired. I ran into this problem in my research when I attempted to record children standing next to a doorway to the playground that had a large window. The bright light from outside shut the camera aperture creating a very dark picture with the youngsters barely visible. This is because automatic exposure adjustments tend to be made on the basis of the *average* amount of light in the shot, thus very bright objects close the lens more than what may be desired. My camera had a button that partially compensated for this problem, but on playback I still found the kids too darkened to see clearly. What would have helped? Covering the window would have solved the problem, but this would also have changed the environmental context. Another possibility is to turn off the automatic shutter and adjust it manually, although this also runs the risk of burning the overexposed image into the camcorder, perhaps even permanently, and the brightness might still obscure the children. Sometimes just positioning the camera in a different location can help. I suspected that the bright overhead lights in the hallway I studied might produce a serious backlight problem, and I did my best to avoid the lights in my camera work. However, on playback I was amazed to find that when I caught some of the

lights in the screen there was little effect on the automatic lens, probably because the lighting was indirect.

Zoom lenses are very helpful, and again nearly universal on camcorders. Yet the zoom, especially at extremes, may distort video information (Collier & Collier, 1986, p. 222). This is something to check while examining alternative camcorders available. Lenses that zoom to a greater extent than others can be more likely to distort at extremes. At this writing, the new digital zooming produces inferior quality results compared with standard zooming, and is not recommended. Both manual and power zooming are standard on most camcorders, and both are valuable in qualitative research. I found that using the zoom lens a great deal significantly reduced the charge of the battery from two hours to about one and half hours duration. Remember that when you zoom the lens for a closeup, the microphone does not zoom in with you--special directional microphones can help, but have problems of their own--see chapter five. Zooming in also magnifies the visual effects of inadvertent jiggling of the camera, which may not be noticed until you leave the field (Jackson, 1987, p. 233). This is particularly a problem when holding the camera with your hand, but is also possible if the tripod is accidentally touched. When holding the camera in your hand, try to move your body instead of the camera or zooming (p. 235), and holding the camera against a stationary object will minimize the jiggles.

People walking by may take only a small part of the visual field when the lens is zoomed to wide angle, but they may completely obscure the visual field if the lens is at the telephoto extreme. Perhaps the rule of thumb is to avoid excessive use of telephoto work; zoom out as far as possible while still able to obtain all relevant data. Jackson (1987, p. 232-233) particularly warns against excessive zooming, which he says is much more interesting while videotaping than it is when playing back. Zoom only when there is good reason to do so.

When using the zoom lens remember that later determination of the size of objects depends upon comparisons; the only way to estimate size of a videotaped object is to have another object of known size in the screen (Jackson, 1987, p. 123). That object of known size must also be approximately the same distance from the camera for adequate determination of size to be made.

Autofocus can present some of the same problems as the automatic lens opening system, although the focus on different camcorders often works in somewhat different ways. In most cases the camera focuses on the objects that fill the majority of the screen, which may not be the things you want to study. With a moving camera, the autofocus may be constantly adjusting. It is tremendously exasperating to watch a segment where something you are studying is taken out of focus because momentarily it takes less than half the screen, as when someone walks by the camera. For some events and objects that are studied in qualitative research, keeping what is studied perfectly in focus may not be essential--you may be able to observe enough detail even when out of focus. The solution for keeping targeted events in proper focus is to disable the autofocus and adjust the lens manually. Most camcorders allow this possibility, but adjusting the focus is difficult while carrying the camera, and can be very distracting for the researcher and those observed even when the videocamera is stationary. Ethologists often use blinds while videotaping, so the camera is hidden or at least not as obvious as it could be. One-way mirrors and screens have also been used in video research (Dowrick, 1991, p. 13). I toyed with using a blind in my school study, but decided against it. If the camera is discovered, it can undermine the potential for trust; a blind is an attempt to mislead people by conveying the impression a camera is not present. In addition, the blind suggests covert and therefore potentially threatening activity as the motivation for videotaping. Much the same thing could be said about a one-way mirror. Blinds are not as necessary today because people often adapt to the camera's presence fairly quickly, in part because camcorders are so common in modern life. Erickson (1992, p. 214) concludes that when trust has been developed, and participants agree with the reasons for doing research, the camcorder is no more intrusive than a pad of paper for note-taking. It is wise to not draw attention to the camcorder, of course. For example, I covered the flashing red light on the front of the camcorder with black tape, and used corners and less traveled areas of the school for the camera to avoid attracting undue attention.

Panning refers to moving the camcorder from side to side, either to survey the environment, to follow a specific event, or to capture an event at another location than what is currently in view. Fast pans can result in blurred pictures, which may be completely unusable data especially for microanalysis. When

surveying or scanning the environment, be sure to use slow panning to avoid both the blurring and possible jerkiness when replaying. On the other hand, if you are following an event by moving the camera's position, let the movement of the objects or people determine the speed of the pan; stay with the event unless the non-moving contextual details are more important than the event.

There are also times when you should forget trying to get good pictures during a pan: if the goal is to quickly capture a detail in another direction, it is better to waste a second of video by quickly moving the camera to the needed position. When making such a change in angle, it is often a good idea to zoom out for a wide angle shot since it is easier to find the relevant action in the viewfinder using wide angle, then zooming in for details if need be. It also helps to keep both eyes open--one eye on the viewfinder and the other taking on the context using peripheral vision. If you are mobile with the camera, it is especially important to keep both eyes open since the peripheral vision of both eyes is needed to avoid obstacles in your path of movement.

Most people are used to very brief visual images lasting only a few seconds because of the many changes of cameras in television programs and commercials (Jackson, 1987, p. 242). But what makes for interesting television can produce very poor research. Often sustained views of an event will allow more careful analysis, and if the sustained view is later considered irrelevant, the fast forward can be used during playback. While videotaping it is often best to keep ones fingers off the zoom and on/off buttons for long periods of time; a long sequence that seems boring in the field may provide extremely valuable information when carefully dissected later on. You certainly do not want that information interrupted with a purposeless zoom, angle change, or the video being stopped!

Placement of the camera is an important decision. Wherever you place the camera, it is important to bear in mind that directions only have meaning as they relate to something consistent. It helps to think in terms of the viewer's perspective as videotaping takes place (Jackson, 1987, p. 231). I recall this being an issue as I was videotaping the school hallway--from one side of the hallway children moved left to walk towards the drinking fountains and restrooms and right to the outside door, but when I moved to the other side of the hallway these were reversed. Since both sides of the hallway looked identical much of the time, I had to carefully record in the log or on the video the side of the hallway where I was located, as well as the specific location. Jackson (1987, p. 232) recommends that the camera only be moved when there is good reason to do so, consistent with Margaret Mead's (1975) earlier recommendation. I think this is a good guideline during early videotaping for one or two hour segments, but I think it is important to vary positions from hour to hour and day to day. Multiple placements can help you gain more perspectives, thus more completely representing the whole physical context. Later in the study, when sequences of events are more predictable, the camera can be positioned where good views of key events are most likely to occur. Still later the camera can be moved to closely follow events. I am sure there are situations where the order of these might be varied, such as when the events to be filmed are known in advance and thus the researcher would try to follow events with the camera during initial phases, and later back off to see the whole more clearly. Placement of the camera, as well as the angle chosen, may influence who and what will be seen as much as what locations will be most represented; some people avoid a camera, others seek out a camera, but eventually most people ignore the camera. The camcorder would not be physically close to key events, as a more distant position may have less of a reactive effect on what occurs--the zoom lens can be used to fill the camera frame. It might be noted that while the telephoto extreme of the zoom may result in less reactivity, I also found that the wide angle extreme could also be used to avoid reactive influences--a camera pointed toward the floor may be ignored, even though the periphery of the frame takes in details not suspected by those nearby. I noticed several times that reactivity increased somewhat immediately after I changed locations of the tripod. Reactivity is influenced not only by camera placement, but also what the researcher watches--I found that a child making faces at the camera often stopped immediately when I turned my head away even though I did not turn the camera.

I found that placement decisions were expedited by studying a map of the locations I planned to videotape. I obtained a drawing of the school from the principal prior to beginning my study, which helped me initially but before long I realized the map was not completely accurate, probably because it was made for some purpose other than research. I made decisions about camera placement from this initial map, but

then while videotaping I drew additional maps that were more accurate and represented the different positions of the camera. Herrera (1988) also drew maps during initial phases of research to give himself a role and be accepted by those observed. Taping a map to the tripod helped me identify specific locations as I made contextual notes and the maps also helped in later data analysis.

Decisions about placement of the camera are often emergent from the data, as one forms ideas about the next placement from the results of a prior placement. The best location for the camera for extended observation may be determined by such trial and error, keeping in mind that concerns about good data may need to be balanced with concerns about intrusiveness and reactivity, as well as safety and space for equipment. It is a good idea to occasionally leave the camera location and look back at how the camcorder appears to participants--you might even take a still photo of your setup and study it carefully for sources of excessive reactivity. If you use a mobile camera, consider having someone else videotape you videotaping--you may spot details about your equipment and person that have an undesired influence that can be readily changed.

Another issue in making videotapes is the framing of the visual information. Erickson (1992, p. 216) emphasizes that every participant should be kept within the visual frame which allows all relevant interactions to be investigated. Collier and Collier (1986, p. 213) add that the entire phenomenon needs to be captured within the frame if systematic comparisons and counting are to be done. Gaining the broad perspective of the event is a good idea during initial recordings, I believe, but there is also a case to be made for close up shots of individuals later in a study. This is because the resolution (clarity) of videotape is not extremely high, thus small changes in facial expression or movements may not be observable if everyone is in the visual frame. The whole of an interaction is important for initial analysis, providing needed context for detailed analysis of closeups (Collier & Collier, 1986, p. 213).

Avoid the tendency to center things, as this may produce less useful data when important surrounding details are not evenly distributed on each side of the central event. Make decisions about framing with the goal of capturing maximal relevant data, rather than the centering often characteristic of commercial television and film. In commercial television and film, human subjects are often centered with the head near the top of the screen. My assistant attempted to do this in some of her videotaping, so that children who could be observed at eye level across the hallway filled the screen. Unfortunately, children who passed near the camera not only obscured the view of those across the hallway, but as children approached the camcorder the centered framing lopped off heads and legs. For some time periods the screen is filled with almost obscene images of tummies and crotches! To some extent I was able to minimize this problem by raising the tripod above the height of children and thus look over the heads of children near the camera, but this additional height produced an angle that was less emic (the camera was significantly higher than children's eyes) but at least when children came near the camera the head and shoulders were emphasized rather than midsections! What angles best capture events? Often a camera facing at right angles to horizontal movement captures more components of the movement, but not necessarily the most relevant details. Finding the angles that produce the most important data is often a matter of trial and error. When experimenting with different angles, keep a log of what was attempted and do ongoing analysis of the results while reviewing the videotape.

While speaking of angles and placement, a few words about using the tripod are appropriate. It is often best to shorten and lengthen the tripod by changing the length of the legs rather than moving the center support stem, as an extended support stem makes the camera more likely to jiggle or tip over. Yet this concern for tipping must be weighed against the issue of taking up floor space; shorter legs and an extended support stem will reduce the space needed for the tripod. Should you turn on and off the camcorder, or just let the videotape record endlessly? I think that in most cases it is better to let the camera record for lengthy periods during the initial phases of research. Extended videotaping may permit you to observe contextual details otherwise obscured, underscoring important antecedents and consequences. You can always fast forward over irrelevant segments later, but you cannot recapture what was not recorded. This was an issue early in my research--why should I let the camcorder record when the school hallway was empty? I decided to let it run, and as a result I was able to observe more deviations from class schedules as well as unexpected events such as the effects of a dog entering the hallway. I also decided to

videotape much earlier than the beginning of the school day on several instances, which revealed an early morning "babysitting" role of the school hallway as children began arriving nearly one and one half hours before classes began. Later, once you have established patterns of time when videotaping is most likely to be most profitable, turning on and off the camcorder makes sense.

Writing contextual notes or logging is important when using a camcorder. If a tripod is used, these can be written, whereas if the camcorder is carried they will either be retrospective, written after recording, or verbal (see chapter five on verbal recording of notes). Written logs provide important information about the immediate context, such as date, time, camera placement and angles, significant changes, and even notations about relevant weather. If you use abbreviations, be sure to note somewhere what the abbreviations mean--these are easily forgotten months or even days later. The contextual framework for a videotape helps provide clues to the meaning of events, as well as suggesting possible antecedents for occurrences. Of course you also need to keep track of the videotape methods used and emerging constructs and hypotheses using field notes. Erickson and Mohatt (1982, p. 141) expanded their logs to make summary charts that indexed events and subactivities on the videotape, thus functioning as fieldnotes.

Jackson (1987, pp. 244-256) recommends that logs include date and time of recording, general and specific locations of the camera, the identity of those present, who ran the camera, the events that took place, the surrounding conditions, and personal feelings about the events. Collier and Collier (1986, p. 189) add that the log should describe the length of activities as well, marked by specific times they occurred. I think that some of these might be recorded in field notes rather than a separate log, but time, date, and location are crucial--I even listed these on the outside of the videotape (attach identification stickers to the tape, not the box, because tapes can get into the wrong boxes very easily). Jackson suggests that an announcement might be included at the beginning of each tape that describes these details, which is not a bad idea, although I prefer having the specific time and date on the screen itself. He also emphasizes the need for an hour or two of logging at the end of the day, so that important details will not be lost. I found that when I kept the camera stationary I could log in the field, while writing field notes, but once the camera began moving this became impossible. I did some of my logging and field notes during the mobile camera phase using a cassette recorder as I drove from the field site to my graduate classes. Jackson also recommends sequential numbering of the tapes.

Conclusion

Again, one of the most important recommendations that can be made is to stay flexible and be willing to experiment. Videotaping is as much art as it is mechanical process. Some people may be paralyzed out of fear of the mechanical aspect, but the art component may motivate them to master the few mechanical details needed. In contrast, the artistic side of the endeavor may frighten others, who need to realize that the art is derived largely through trial and error in accomplishing the goals of the research. The mechanical describes the actual physical process of transferring visual events onto videotape, but the art involves the dozens of decisions about how one goes about positioning and adjusting the camcorder. Videotaping for qualitative research uniquely combines artistic creativity and mechanical skill.

5. SOUND RESEARCH: THE AUDIO TRACK

Sound is a crucial element in most qualitative research studies. The human voice distinctively communicates meaning and point of view, thus a central element supplementing visual data in videotape research is the accompanying sound.

Often, the microphone that usually is perched on top or at the side of the camcorder is sufficient, although Lancy (1993, p. 110) decries the poor quality of built-in microphones. Sometimes special microphones are required. These may be attached to stands, hand-held, clipped on clothing, supported by a boom, or even suspended from the ceiling (Pellegrini, in press, p. 270; Erickson & Mohatt, 1982; Jackson, 1987, p. 166). Several microphones may be needed, or only one may be sufficient.

Sounds, like pictures, are relative to other sounds. Determining how loud something was during videotaping requires that something else be recorded of known loudness. However, the standard camcorder today includes a compressor that considerably equalizes sounds that may originally have been very different intensities. Few camcorders allow this often valuable device to be disengaged. Pitch can also be subject to tiny changes in the process of videotaping, since the speed of the tape can vary while taping and can be different between recording and playback (Jackson, 1987, pp. 124-125). If pitch or extremely constant speed is crucial, check this before deciding what equipment you will use. Placement of microphones is usually easy. The goal is to locate a location that maximizes the desired sound and minimizes distracting background noise. Beware of phase cancellation problems that occur when sound reflects off nearby walls. Jackson states that this can often be minimized by not placing the microphone directly on a table top but using a boom. Another option is to use a stand with rubber pads, which will also avoid noises from accidentally touching the table, or that are transmitted to the table from the floor.

If you decide to hold the microphone in your hand, keep the hand as motionless as possible because of the noises created by movement. Moving microphones back and forth between an informant and researcher during interviews is very distracting and only needed when there is a great deal of background noise.

Choice of Microphones

What microphone is best? Is the more expensive microphone always better? The answer to these questions is not as simple as might be suspected, as microphones are made for many different sounds; what is ideal to record the deep sounds of a kettle drum in a symphony will probably produce distracting thuds in qualitative research. A microphone intended for a singer holding the microphone next to the mouth may be completely unsuitable for more distanced work. An omnidirectional microphone is excellent for recording many different voices if there is little background noise, but poor if you want only one voice from across a crowded room.

The beginning researcher can ask opinions of those more experienced, but often finding a good microphone is a matter of trial and error. For general work, the microphone that came with the camcorder may do a very suitable job, but it needs to be tested in the field environment before a final decision is made. Rooms with flat walls and floors with little furniture and no curtains may echo quite a bit, and while the human ear can compensate for this to some extent when in the room, the microphone may not do as well (Jackson, 1987, p. 179). Greater distances between the microphone and sound sources tends to reduce intelligibility because of echoes and noises from the environment. Special directional microphones can help span distances better, but they can be expensive costing hundreds and even thousands of dollars, and present problems of their own (see Jackson, 1987, pp. 173-177). In general it is best to find a microphone that reproduces the middle and high end of the speech frequencies clearly. Many sounds like S and T will be unclear without clear reproduction of the high end, although too much emphasis on the high range may result in disturbing clicks and hisses from air conditioners and furnaces. Too much emphasis of the low to mid ranges may accentuate disturbing noises such as fluorescent light hum (Lancy, 1993, p. 246).

An important issue to consider when choosing a microphone is the presence of ambient sound (Jackson, 1987, pp. 167-170). This is the background that humans tend to mentally filter out when at the research site, but can be extremely distracting when playing back the tape at another location. While in the Caribbean I once taped a woman with a beautiful singing voice singing on a porch, but upon later playback I found I could hardly concentrate on the music because of all the insect and bird sounds in the background! Ambient sound can be minimized by either placing the microphone closer to the sound source or using a special directional microphone that will only pick up sound in a narrow pathway in front of the microphone.

It is also important to remember that when the distance between the microphone and source of sound is small, minor movements can make a huge difference in sound levels (Jackson, 1987, pp. 170-173). Even moving a foot or two at close range can allow ambient sound to overcome the desired sound.

Directional microphones can actually increase the changes in volume, since the person is likely to move to the side and thus away from the sound field of the microphone. When deciding about microphones, try to find one with a windscreen. This may be a physical, sponge-like covering, or it may be an electronic circuit that cuts off low frequencies. Some camcorders have this built in. Leave the windscreen on at all times, as it reduces the air currents that exist both outdoors and inside buildings, which produce loud, low pitched sounds that can be very distracting (Jackson, 1987, p. 179).

High Fidelity and Stereo Sound

High fidelity audio on a camcorder produces sound quality with a much wider frequency response than the standard videocamera, while decreasing the amount of background hiss and noise nearly to the level of a compact disk. But, unless you are dealing with rather quiet sounds, the additional quality may translate to an unneeded expense, and the extra frequency response may magnify extreme highs and lows to the point of distracting from the more important data. The solution to that magnification can be to use a high quality amplifier on the playback unit so that bass and treble controls will decrease the distracting extremes. An audio equalizer during playback or even while recording may be an even better solution, so that the sound can be precisely tailored to maximum intelligibility. It is important to note that if you do not have a hifi playback unit, a hifi camcorder is a waste of money, and vice versa. In my research I did not use a hifi camcorder or playback unit. My sound suffered because high sounds were not clearly reproduced, and turning up the treble on playback accentuated the hiss as much as desired audio, obscuring those sounds. If your budget permits, I suggest that you use high fidelity equipment particularly if sound is important to your research concerns.

What about using stereo sound? Two microphones placed at two locations in the environment can produce additional data; the closer one is to a microphone, the more understandable the sound (unless one shouts into the microphone). The two channels in a stereo system can also be used for very different kinds of sound, such as one channel for audio data from events and people observed and the other channel for whispered comments about the data by the researcher. One channel could be used for a microphone attached to the camera, and the other for a second microphone, perhaps even a wireless microphone, placed elsewhere. One microphone could be aimed toward an event, and the other towards people not involved in the event but possibly making comments about what is happening.

Two or more microphones can also be used with any kind of video system by adding an inexpensive audio mixer. A small mixer is easy to use, but simply adding more microphones and leaving them all turned on can in some cases make audio less clear because of the addition of slight echoes picked up by microphones more distant from the person being heard. This is termed *acoustic phase interference* (Jackson, 1987, pp. 187-190). The ideal is to only turn on those microphones that are close to the desired sound source, but if those being videotaped move very much it can be difficult for a single researcher to turn up and down audio controls while also writing logs and field notes and also watching the camera and observing events. No wonder the old film ethnographers often took a whole team to do their filming!

Lancy (1993, p. 110) emphasizes that wireless, lapel microphones are the only satisfactory kinds of microphones for qualitative research; "Hock your pearls if you have to!" he concludes. Pellegrini (in press, pp. 270-271) describes the use of wireless microphones in his research, in which several children wore tiny lapel microphones and pocket transmitters, or special vests with microphones and transmitters already installed. There is limited distance with wireless microphones, and usually the receiver must be in the same room. Several microphones can be used simultaneously if tuned to different frequencies and different receivers are used for each frequency. The receiver/s can be mixed and fed into the camcorder or a separate taperecorder. Again, echoes from multiple live microphones may obscure rather than aid intelligibility. Pellegrini emphasizes the importance of having extra microphones, transmitters, and batteries handy because of breakdowns. He notes that children soon forget they are wearing the microphones and talk as if no outsider can hear, when they speak quietly to their friends or themselves. Yet Jackson (1987, pp. 186-187) is more skeptical about wireless microphones because they add additional electronic equipment--transmitters and receivers--and can be subject to interference from nearby radio stations.

Using the Microphone for Field Notes

Field notes are usually written, but it is also possible to use a cassette recorder to record notes (Pellegrini, in press). This has the potential for disrupting the social situation if comments are spoken much above a whisper. Sometimes even whispers can disrupt. Pellegrini recommends the use of a steno mask which keeps others nearby from hearing. A voice operated recorder may be useful for note taking, although such recorders often clip off part of the initial syllable of speech as it turns on, reducing intelligibility.

During the initial distanced observations segment of my study, I decided not to use the microphone for note-taking, but rather to write standard field notes, partly because I believed the time needed to write encourages a bit more reflection and partly because of fear I might disturb the social environment even by whispering. However, when I later began carrying around the camera, pen and paper notes became impossible. I thought of carrying around a cassette recorder to make notes, but that would add to an already heavy load of equipment I needed to carry with me. I considered using a hands free microphone as is used by some performers, which could be plugged into the audio input of the camcorder, but found them prohibitively expensive. I discussed the issue with my friend who teaches television broadcasting, and he loaned me a tiny microphone with a built in audio compressor that would automatically raise and lower the amount of sound even more than the camcorder would normally do. He wound the cord around the viewfinder of the microphone so that the microphone dangled near my mouth. I disconnected the regular microphone attached to the camcorder and plugged in the much smaller compressor microphone, which ran on a watch battery. Preliminary tests revealed that even softly whispered comments were clearly recorded on the tape. In the field, I was amazed to find that children's comments in the hallway were also picked up very clearly whenever I was not whispering notes, because the added compressor and tiny microphone so effectively did their jobs. Were my verbal notes less reflective than written notes? Perhaps so, although I still did some reflection on what I saw. But the possible decrease in reflection was more than offset by the incredible increase in the number of notes possible. Later, when those verbal notes are transcribed it is possible to be even more reflective than while writing field notes, since attention is not divided between writing down events and thinking about them. But it may be that something is lost by not reflecting while in the observed social context.

My camcorder, like most, also has an earphone jack, and when I used the compression microphone I also used a tiny earphone in one ear. I do not think headphones are a good idea because they more easily come off and it is difficult to replace them when holding a camcorder. There is something to be said for leaving one ear uncovered for hearing contextual sounds. I used an earphone to be certain the microphone was working--batteries can go dead, and wires can break but not look broken--as well as monitor what is picked up; if something crucial from the social situation was heard in my free ear but not in the ear with the earphone, I could immediately repeat it to be sure it was recorded. Children made several comments to me and one another when I began talking quietly into the microphone as I carried around the camcorder. One asked me for an explanation, perhaps fearful that I was talking to myself. I told her I talked my notes instead of writing them, which appeared to satisfy her curiosity. On another occasion I noticed a child imitating my talking to the microphone, telling her imaginary microphone, "Kids leaving the room."

Perhaps the biggest problem with this approach, other than the possibility of disturbing the environment, is the time it takes to transcribe these taped notes (LeCompte & Preissle, 1993, p. 231). Of course this is a difficulty in transcribing any audio data, such as interviews.

Sound is an important component in videotaping. Sometimes sound provides needed auditory context for visual information, at other times it provides explanation of visual data, and on still other occasions it adds completely separate data from the visual material. Easily overlooked, the microphone is a second "lens" for qualitative data.

6. TRANSCRIPTION, ANALYSIS, AND CONCLUSIONS

Transcription can be an overwhelming process in qualitative research using videotape because of the hundreds of details that a single brief segment of videotape includes. To list everything in a photograph can be very time consuming, and to exhaustively transcribe even a couple hours of videotape is a herculean task because of time consumption and cost (Lancy, 1993, p. 104).

The question, then, is *what* do you transcribe? This question, of course, relates to the theoretical basis of the study as well as the related issue of the importance conferred on various kinds of data. While observing and videotaping researchers must note a wide variety of contextual information, yet they must also attend to the reasons for their choices of events that are given prominence. Qualitative researchers tend to begin with the broad perspective, then "funnel down" to specifics. As one records video data, as well as during the playback of the video record, major categories will surface--and be chosen--that need to be recorded. While transcribing is often assumed to come before data analysis, Kendon (1979) describes content analysis of video data as *preceding* transcription. Thus multiple viewings of video recordings constitutes a preliminary analysis for determination of major structural units, and once these are determined transcription of data related to those units can occur.

Beresin (1993, pp. 14-15) describes how she developed several kinds of transcripts simultaneously during her qualitative research. She developed a videotape transcript for speech, a second for gestures, a third for gaze, a fourth for patterns of movement, and other transcripts for other topics. As a result each area could be analyzed separately, or transcripts could be placed side by side for comparative study.

One mechanical difficulty that can develop during the transcription and analysis process is stretching or breaking the videotape. These become more likely when the tape is played repeatedly, as is required for microanalysis of small segments of tape. Because of the danger of breakage, never use the original tape for any analysis; use a copy.

If you copy a tape, use two high quality machines or a dual video deck. You can make copies on any videorecorders, but you might consider using the camcorder on which the tape was made as the playback unit when dubbing a copy since the position of the head during playback should be precisely the same as when it was recorded. Use the audio-type cable connections rather than the antenna connections to keep the quality of the copy higher. While copying tapes to other tapes is acceptable, the ideal is to transfer the data to videodisks since they do not wear out and access to a taped segment is quicker and easier than using the fast forward and rewind on a videotape player (more on this later).

Reliability and Validity

It is during the transcription phase of videotaping that issues of reliability and validity might be considered. Reliability, the consistency of observing a specific event from one time to another by the same observer--intraobserver reliability--contrasts with consistency between different observers of the same event--interobserver reliability. Videotape allows precise measurement of quantitative reliability since the observer/s can examine the identical event from the same position multiple times. For qualitative researcher, too, reliability is enhanced by using video as definitions can be reformulated or refined to increase reliability (Lancy, 1993, p. 117). If the main goal is enumerated reliability, one can do the statistical procedure necessary to identify the degree of reliability (Gephart, 1988). My two elementary school aged sons and I did this with some of the videotaped data in my research--we compared counts of various categories of behavior.

In contrast, qualitative reliability of videotapes is more difficult to summarize and has received less attention in the literature (Kirk & Miller, 1986, p. 42). It is possible to express reliability of verbal transcription, perhaps, by comparing two transcriptions of verbal data by either the same person or different people. Every time the two transcriptions have the same word would be a hit, and every time a different word was transcribed would be a miss. These, in turn, could be expressed as kappa coefficients and level of significance determined. I suspect agreement would be very high with such a procedure! Reliability becomes more difficult to measure with visual data because there are so many kinds of data in a single picture, and these are multiplied when one adds time and sequence dimensions with the moving pictures of videotape. With precise description of categories, it is possible to measure hits and misses between

observations, and again produce kappa coefficients. The difficulty, of course, is that quantitative representations are attempting to summarize qualitative data. Since reliability is often difficult to determine with qualitative research, it is more reasonable to consider validity, which is a major strength in qualitative work (LeCompte & Preissle, 1993, p. 341). Before validity can exist reliability is required, thus evidence for validity is sufficient to demonstrate reliability. Validity moves us beyond consistency in observation to congruence between perspectives, establishing credibility and trustworthiness of research, so that data from different research tools, observers, studies, and theories may be triangulated into a more comprehensive picture of the whole phenomenon studied (Patton, 1990, pp. 464-470; Lincoln & Guba, 1985, pp. 305-307; Marshall & Briggard, 1975; Fielding & Fielding, 1986). Videotape can be used in recording any of these sources of congruence, but videotape is particularly helpful in aiding the convergence of participant and researcher perspectives, which is central to establishing qualitative validity (Mehan, 1979, p. 22). Other factors in videotape research that can help assure a degree of internal validity include an extended time of videotaping, self-monitoring of the researcher, openness to data, a search for exceptions ("negative cases") of an emerging trend, member checks, and an audit trail (LeCompte & Preissle, 1994, pp. 341-348; Lincoln & Guba, 1985, pp. 301-304, 309-316, 319-320; Patton, 1990, pp. 463-464). Any of these could be evidenced by video record. In contrast, external validity is more assured by a comprehensive description of the general and specific contexts of the study, again aided by video either in gaining contextual data for verbal description or sharing contextual data visually. Most of these listed means of establishing internal and external validity have been considered in earlier chapters as being important aspects of good videotape research. Perhaps most significant to qualitative videotape validity is that the images formed by a camcorder are more direct and mechanistic reflections of reality (Collier & Collier, 1986, p. 7; Ball & Smith, 1992, p. 6, 16), and thus tend to be more believable and credible because of the assumption that "pictures cannot lie." Credibility and believability of a record is ultimately the bottom line in the quest for validity.

Analysis of Videotape Data

I believe that the analysis of videotaped data has many advantages over analysis of other kinds of qualitative data. Important segments can be extracted and repeatedly viewed for details by a single observer, or a segment can be viewed by several different observers for analysis. Multiple viewings of the same event is simply impossible in standard fieldwork without a video or film recording device, and multiple segments of similar events can be directly compared and contrasted without relying on written descriptions alone. Computer programs can aid this comparison and contrast process, either as an adjunct to videotape--the computer word processor screen and video screen side by side--or with the videotape and computer programs linked (to be considered shortly). But in every case the most important analytic tools are the human eyes and brain observing the screen (Jackson, 1987, p. 122).

Video analysis is more difficult than making videotapes because it involves abstracting and creating new knowledge, suggest Collier and Collier (1986, p. 169). They also decry the lack of analytic tools for pictorial data (p. 13). However, many standard analytic procedures used by qualitative researchers with verbal data can be adapted for use with videotape data. Several examples will be provided shortly.

Who should do the analysis of videotape data? While some might emphasize the prominence of the researcher, because of his or her familiarity with how the research was conducted as well as the surrounding environment, Collier and Collier (1986, pp. 23-27) describe analysis as a cooperative effort between participants and researcher. Participants become educators, teaching the researcher their perspectives.

Additional outsiders might also be included in the video analysis. Multiple observers bring different life experiences and perspectives to the analysis, potentially creating a more encompassing view of the video data. Collier and Collier (1986, p. 194) mention using teams of people, both participants and outsiders, to analyze visual data so that discussion can ensue and produce a higher level of analysis than one person alone. By using those observed and outsiders in the analysis, both emic and etic perspectives can be compared and contrasted. The more varied the analysis, the more likely that significant aspects of the situation will be revealed and the more likely at least some of the analysis will reflect latent meanings and values. There is also greater likelihood that convergence of views between observers will occur, a form

of triangulation as a means of validity. One can also examine convergence between multiple analyses of the same videotape segment by the same person as evidence of intraobserver reliability; a second viewing may produce confirming or disconfirming data for the analysis. Yet the cost of such analyses, particularly fine-grained examination of zoomed in activities, can be prohibitive (Lancy, 1993, p. 104). Any kind of video analysis is very time consuming (Collier & Collier, 1986, p. 148). Keep careful notes about how you do your analysis of videotapes. These, combined with videotape logs and field notes, constitute an audit trail which can be examined by outsiders for methodological strengths and difficulties. The audit trail also constitutes an potential means of establishing validity of qualitative research (Lincoln & Guba, 1985, pp. 319-320).

While Collier and Collier (1986, p. 170) believe that verbal and visual records should not be separated, I think there are times when video and audio segments of videotape deserve separate analyses, which can be followed with comparisons and contrasts to provide additional insight to visual-audio linkages. Mehan (1982, p. 70), for example, analyzed the audio segment of videotape for three components in classroom events: initiation, reply, and evaluation. Some of his audio transcriptions required visual cues as well, such as children raising their hands to initiate in class. Erickson and Schultz (cited by Lancy, 1993, p. 103) separated visual and oral analyses by examining kinesic and other nonverbal components of speech visually while using "voice print analysis" with verbal material.

Developing Categories

Analysis usually moves from initial impressions to more systematic procedures (Collier & Collier, 1986, p. 172). This often involves developing categories and coding data with those categories. Complex code sheets with many different categories can be developed (p. 243). At the other extreme is describing themes in the videotape, using a very open-ended approach. Lancy describes the possibility that open-ended analysis may not reveal coherent patterns, and thus the videotaped activity may elude systematic analysis (p. 230). Yet it is always important to be open during analysis and experience the fluent wholeness of the video record (Collier & Collier, 1986, p. 170). Categories used in analyzing videotape data can be emergent from the context or infused from outside the context. Unique insights can particularly be possible by using metaphorical and analogical descriptors that may tap processes at work. In my research I used *constant comparison* procedures (Glaser & Stauss, 1967) to help develop categories grounded in the videotape data. I began by naming indicators of potential categories of activity by answering the question, "What is this an example of?" Very early in my work I realized that children grouped together in the hallway, sometimes at the teacher's initiative and sometimes without it. By comparing codes, I found consistencies of meaning across numerous codes, reflecting a category. In my case, videotape and personal observation revealed that children's groups took on different physical shapes and these shapes appeared to be related to distinctly different functions of the group, which I thought could be related to different meanings to participants (this was confirmed in later interviews). Over time, certain categories become central in the ongoing analysis of video data, which are termed "axial categories," and finally a "core" category can emerge that relates all the other categories and is the nucleus of the emerging theory. In my research, the groupings fell into the axial categories of school lines, phalanxes (walking side by side), and clusters of children. The core category was the cultural meaning of these groupings to children--whether they were imposed groups oriented toward school culture (the lines), or spontaneously formed peer culture groupings (the clusters), or fusions of school culture and peer culture (the phalanxes).

Analytic Induction and Constitutive Ethnography

Znaniecki (1934) formalized a data analysis procedure which involves two steps: the development of a hypothesis from specific events and then, as additional examples of those events are examined, the comparison of that hypothesis with possible alternative explanations (pp. 261-262). The hypothesis is continually reformulated to fit all observed examples. Later follower's of Znaniecki's method of analysis, termed *analytic induction*, underscored the search for exceptions to the hypothesis as central to hypothesis reformulation (e.g. Robinson, 1951). The goal is to explain all of the data with a comprehensive hypothesis.

Mehan (1979, pp. 21-30, 206) adapts analytic induction to the analysis of videotape data, emphasizing that the researcher's and participants' perspectives should converge in the process of seeking

explanations for behavior. However, Mehan emphasizes that the very act of asking participants for information about events influences the way they respond, and thus he recommends observing behavior as it naturally occurs to determine if it conforms to emerging hypotheses. Mehan's adaptation of analytic induction, which he terms *constitutive ethnography*, involves observing an event carefully while developing "recursive coding rules" that describe the event comprehensively. The process begins with transcribing the audio portion of the videotape, which is then compared with the video mode and identities of speakers--when possible--are added, as are notations of nonverbal activities. Descriptions of specific sequences and episodes are developed, which are then compared with other events to determine degree of similarity. The emerging model is then modified and compared with initial observations. The emphasis throughout is determining where the "seams" of behavior are, the natural dividing points in the flow of behavior (p. 29). These events are then coded using mutually exclusive categories. Later the videotapes are observed by participants and researchers in a joint study session, which allows participants to correct or verify the interpretations of researchers and explore the distinctive ideas of those studied. The joint study sessions also allow participants to gain new insights into their own behavior (p. 206).

Microanalysis

Erickson (1992) describes a somewhat similar procedure termed *ethnographic microanalysis*, which emphasizes the *how* of human interaction rather than the *what* (p. 205). He emphasizes that this method of analysis should only be used when standard methods of describing behavior fail to produce needed details. Like Mehan, Erickson also links his procedure with analytic induction (p. 220). Microanalysis involves describing and measuring or tracking an event or behavior in detail by repeated examination of sequences (Collier & Collier, 1986, p. 184).

Erickson recommends filming one or more entire days of data so that interactions can be examined for typicality. Key contrasts between recurrent events can then be identified, as well as unique and rare events (p. 207). The researcher attempts to determine how well the conclusions generalize across the recurring events within the immediate context and then across different contexts (p. 208). Analysis begins during the videotaping, as the choice of people or events is an analytic decision. However, the majority of analysis occurs after the completion of videotaping (p. 217). Erickson's method of analyzing videotapes involves five steps (pp. 217-222). Initially the emphasis is on the whole of the event, as the researcher examines an entire sequence without pausing or using slow motion. Field notes are written while watching the video, much as would be done in a standard field setting.

The second step is identifying major boundaries between events. This involves playing and replaying the tape, both forward and backward, at those places where boundaries between events are thought to exist. Locating boundaries involve finding three phases in the event--the beginning, the focus of activity, and the conclusion which leads to the next event. Predictable changes in body language and use of space often accompany these three phases.

The organization of the three phases in several selected tape segments makes up the third step in analysis for Erickson. Linkages between sequences of activities are located, elaborating the skeletal structure identified in the second step. The researcher considers how each participant in the interaction contributes to the event, including the mutual influence between those involved, not just the individual actions in isolation. After the completion of the third phase, the statements and nonverbal communication of participants are transcribed, guided by the analytic purposes of the research. During this phase the cultural influences upon interaction become most salient.

The fifth and final phase of analysis involves comparing the segments analyzed in earlier phases with the remainder of the videotapes to determine representativeness. Other segments may be microanalyzed for comparison, and frequencies of typical and non-typical events may be determined. The researcher also examines the whole videotape record to determine if there are exceptions that make conclusions less than comprehensive.

Collier and Collier (1986, pp. 176-178) emphasize that microanalysis of videotape can reveal the internal dynamics of activities. In their approach to microanalysis, similar segments of videotape can be viewed side by side, emphasizing sequence at first by using slow motion and scanning, both forward and reverse. Slow motion, they note, is especially helpful for gathering details, while high speed scans help in finding broader patterns (pp. 181-182). Microanalysis can result in diagrams of behavior patterns (p. 184).

The Colliers include microanalysis as an optional component in their broader outline of video data analysis (p. 178): 1) watch the film repeatedly in its totality, an "immersion" that can last for weeks, 2) inventory the film by categories of activities, spaces, or other appropriate components using codings or standardized protocols, 3) focus the analysis on newly discovered ideas and the original questions for the research, using microanalysis of details if needed, 4) make conclusions by organizing details in the context. These steps are a helpful way to outline the analysis of videotape, although I think it is important to emphasize that one can be at different stages with different topics at the same time, and that there could be multiple cyclings of the four stages.

Kendon (1979) describes a multiple tiered variation of microanalysis, in which behavior is understood to exist at more than one level simultaneously. Kendon identifies an entire interactional event as a "formation," which subsumes the second level of "presentation"--location and orientation of participants. A third level is "posture," the positions of those interacting, which frames sequences of behavior. A position involves a fourth level of analysis, the specific actions which are termed "points." The levels are successively recognized during analysis, each requiring repeated viewing of the videotape for thorough description. Kendon's variety of microanalysis may be particularly appropriate for conversation-interaction video analysis (Goodwin, 1981; Condon, 1970; Psathas, 1990) but be less applicable to qualitative research more generally.*The Video-Computer Connection*

Computers have increasingly become an important component in qualitative research (Pfaffenberger, 1988; Tesch, 1990). A relatively recent development in videotape analysis makes use of computers and sometimes video disks. The advantage is that computers provide a more systematic and direct way of analyzing videotapes, although both are still merely tools to help the most important part of analysis--the human brain--do its work.

In my research I made use of a computer and video in perhaps the least sophisticated way possible--the video monitor was placed next to the computer monitor. My transcription involved a standard word processing program, using my handwritten field notes as the basic text, and adding details from what I saw on the video screen. I made careful notations of time every few minutes on my handwritten notes as well as the computerized notes, so key segments of film could be located during analysis. Each day, I printed the results of these efforts so I had a paper copy ("hard copy") of the notes as well as the files in the computers. Later, as I used several of the analytic procedures described earlier, I played relevant segments of tape over and over, and made either handwritten notes or notes on the word processor. I also used word-search capabilities of the word processor to find other written and corresponding video segments on related topics. While my word processing program allowed me to see two screens at once, I found it was more convenient to simply place the transcribed notes for two related segments side by side for comparison and/or watch the video segments one after another. Computers are wonderful tools, but they do not do everything equally well; the manual method was more satisfactory for me, although still a bit cumbersome.

Some have moved a step beyond the side by side approach--either manually or on the screen--to mix the written word and video segments. Michael Hale at the University of Georgia, for example, has developed the *Videotape Data Analyzer*, which links a video player with his own qualitative research software (Tsao, Hale & Fan, 1994). This system displays the videotape in a corner of the computer screen, while the rest of the screen can be used for writing notes or inserting codings for the notes. Segments of tape associated with specific codes can be automatically located on the videotape by inserting the coded word or a time code which is added to the tape on one of the stereo channels. The program also has graphing abilities. The Videotape Data Analyzer requires a standard computer, an adapter, and a specialized videorecorder.

Using actual videotape during analysis, with or without such a program, has the disadvantage of having to wait for the video player to fast forward or fast rewind to a selected videotape segment. A short segment can be loaded into the computer's memory, but one must wait for the videotape to locate the second segment for comparison. To locate several segments on a videotape can take several minutes; they cannot be compared side by side unless there are several videoplayers with multiple copies of the tape. Comparing segments from several videotapes is also difficult, requiring you to either change tapes and wait for the fast forwarding, or use multiple tape players, or dub the segments onto a separate tape which is even more time consuming. Much faster access time for video segments is possible through the use of hypermedia systems (Williams, 1992; Barrett, 1992; Seaman & Williams, 1992). This involves transferring video segments from videotape to a laserdisk. Access time from any segment to any other segment is reduced to the time it takes to click a computer mouse, and since each frame of video is indexed, millions of comparisons become possible. Written text and codings of written or videotape data can be linked with recorded speech, still photos, and videotape segments that are on a videodisk, and each of these can be accessed immediately. Problems of deteriorating quality due to extensive playbacks or due to copying no longer exist because information is digitized in a format common to all forms of media: computer codes. Hypermedia systems are being used for video qualitative research at a number of universities across the country, including Georgia State University (Daniel & Golley, 1995) and Massachusetts Institute of Technology (Segall, 1990). The limitation to this approach, at least with the current state of technology, is the tremendously large amount of memory needed to store data (Seaman & Williams, 1992). For example, a single videodisk can only hold about 1 1/2 hours of visual data (Biehla, 1995). A CD rom disk holds even less. To avoid shuffling videodisks, as well as reduce costs, most users of hypermedia currently transfer only selected segments of videotape rather than the entire corpus of their data. That limits the available material to be accessed, delimiting the scope of analysis to the selections of the researcher.

Continually increasing memory capabilities of computers will eventually bring solutions to this problem, as the gigabite replaces the megabite as the standard unit of computer memory. In the more immediate context, some of the limitations of memory with current hypermedia systems can be overcome through the use of larger, mainframe computers accessed through the internet. Through the World Wide Web and Mosaic internet systems, video of any length can be accessed and shared in any part of the world. At present an anthropology interactive video system is in place, headquartered at the Ethnographics Laboratory at the University of Southern California. Unfortunately, there are still some bugs in the developing system, including rather slow access time, some incompatibility difficulties, and lack of precise linkages between text and video (Biehla, 1995). Hypermedia brings a new dimension to video analysis by the potential for blurring the roles of reader and researcher, as the "reader" of a hypermedia computer can develop distinctive links, analyses, and conclusions, and ignore or delete those of the researcher (Seaman & Williams, 1992). The individual using hypermedia is not restricted to the linear form of a researcher's written summary and analysis, but can connect any portion of any variety of media available to any other in any sequence desired. As a result any two "readers" of hypermedia are likely to develop very different analyses from the same body of data. Unique and individualized interpretations and conclusions are thus likely to emerge from such analyses.

Forming Conclusions and the Making of Meaning

Conclusions from analysis require that the researcher creatively move beyond the data, although doing so within the framework of scientific craftsmanship (Collier & Collier, 1986, p. 198). In making conclusions, once again all of the data should be reviewed as this helps determine how the different elements of the analysis fit together into a synthesis. It is important to move beyond the details to regain the big picture, although this time the data is observed from the perspective of prior analysis of details (pp. 203-205).

Because of the potential for unique, personalized analyses and conclusions by the user of hypermedia systems, the conclusions reached from a given study are no longer dependent on the researcher, although the data *collection* is still powerfully influenced by researcher decisions in the field. The ideal of modernist research is complete objectivity that mirrors reality, accomplished by a distanced view of phenomena. In contrast, ethnographic research tends to emphasize the realistic rather than the objective

(Ball & Smith, 1992, p. 16). The disenchantment with positivistic language and science is something ethnomethodologists hold in common with postmodernists, thus postmodernist researchers can gain much by examining the research methods of ethnomethodologists (pp. 68-70).

For those in the ethnomethodology tradition, the interpretation and analysis of videotape data is constructed reflexively (Ball & Smith, 1992, p. 56), a product of the researcher interacting with the site context and those in that context. The researcher attempts to find how participants make sense of what they do and experience (p. 61). This process of understanding is a procedure shared with others that involves looking for order and meanings in practices (p. 62).

Videotape recordings are only the beginning of the making of meaning. The camera is holistic and free from abstraction in its concrete representation of reality. Yet media can also be understood as producing social constructions (Barrett, 1992, p. 1). The camera is not objective because the camera is very much influenced by the photographer's attitudes; that image is always a selective slice of the world (Collier & Collier, 1986, pp. 7-9).

7. FINAL COMMENTS

Videotape data can provide distinctive input into the various disciplines that make use of qualitative research. While this book has emphasized videotape as a data source to be directly studied or used as a stimulus for responses from research participants, the other purposes for which videotape can be used in research also deserve attention (see chapter two).

The future is impossible to predict, but it seems likely from the most recent developments that more and more videotape records will become available to an increasing number of people. This suggests an almost unlimited sharing of data and perspectives that can hardly be imagined at present. This openness and sharing can help free video analysis from the limited perspectives and naive biases that sometimes characterized the research of prior generations. Perhaps in the future the videotaped dissertation will become a reality, an idea first suggested to me by my qualitative research mentor, Judith Preissle. With additional developments in video and computer technology, unprecedented advances can be made in creating and using videotape in qualitative research.

REFERENCES

Agar, M. H. (1986). *Speaking of ethnography*. Newbury Park, CA: Sage.

Albrecht, G. L. (1985). Videotape safaris: Entering the field with a camera. *Qualitative Sociology, 8*, 325-343.

Arijon, D. (1976). *Grammar of the film language*. New York: Hastings House.

Ball, M. S., & Smith, G. W. H. (1992). *Analyzing visual data*. Newbury Park, CA: Sage.

Barrett, E. (Ed.) (1992). *Sociomedia: Multimedia, hypermedia, and the social construction of knowledge*. Cambridge, MA: The MIT Press.

Beresin, A. R. (1993). The play of peer cultures in a city school yard. Doctoral dissertation, University of Pennsylvania. (University Microfilms No. 9331755)

Biehla, P. (1995). Academic hypermedia: A reply and update. *Visual Anthropology, 7*, 240-248.

Brigard, E. (1975). The history of ethnographic film. In P. Hockings (Ed.), *Principles of visual anthropology* (pp. 13-43). Aldine: Chicago.

Caulfield, J. (1991). The work of knowledge in the age of mechanical reproduction. *Visual Sociology, 6*, 5-8.

Chalfen, R. (1989). Native participation in visual studies. Session at the Amsterdam Conference on Visual Anthropology and Sociology, as reported in *Visual Sociology Review, 4*, 151-152.

Collier, J., & Collier, M. (1986). *Visual anthropology: Photography as a research method*. Albuquerque: University of New Mexico Press.

Condon, W. S. (1970). Method of micro-analysis of sound films of behavior. *Behavior Research Methods and Instrumentation, 2*, 51-54.

Daniel, P., & Golley, P. (1995). Video ethnography: Telling stories of change in the reflective teaching model. Paper presented at the Eighth International Qualitative Research in Education Conference, Athens, GA.

Dowrick, P. W., & associates (1991). *Practical guide to using video in the behavioral sciences*. New York: Wiley.

Dowrick, P. W., & Biggs, S. J. (1983). *Using video: Psychological and social applications*. New York: Wiley.

Eastman Kodak Company (1966). *How to make good home movies*. Rochester, NY: Eastman Kodak.

Erickson, F., & Mohatt, G. (1982). Cultural organization of participation structures in two classrooms of Indian students. In G. Spindler (Ed.), *Doing the ethnography of schooling*. New York: Holt, Rinehart, & Winston.

Erickson, F. (1992). Ethnographic microanalysis of interaction. In M. LeCompte, W. L. Millroy, & J. Preissle (Eds.), *The handbook of qualitative research in education* (pp. 201-226). San Diego: Academic Press.

Fielding, N. G., & Fielding, J. L. (1986). *Linking data*. Newbury Park, CA: Sage.

Gephart, R. P. (1988). *Ethnostatistics: Qualitative foundations for quantitative research*. Newbury Park, CA: Sage.

Glaser, B. G., and Straus, A. L. (1967). *The discovery of grounded theory*. Chicago: Aldine.

Goodwin, C. (1981). *Conversational organization: Interaction between speakers and hearers*. New York: Academic.

Heider, K. (1976). *Ethnographic film*. Austin: University of Texas Press.

Hockings, P. (1975). Educational uses of videotape. In P. Hockings (Ed.), *Principles of visual anthropology* (pp. 383-384). Aldine: Chicago.

Hyatt, K. S. (1992). Documentary images: Visual information made to order. *Visual Sociology, 7*, 68-79.

Jacknis, I. (1988). Margaret Mead and Gregory Bateson in Bali: Their use of photography and film. *Cultural Anthropology, 3*, 160-177.

Jackson, B. (1987). *Fieldwork*. Urbana, IL: University of Illinois Press.

Kendon, A. (1979). Some theoretical and methodological aspects of the use of film in the study of social interaction. In G. P. Ginsburg (Ed.), *Emerging strategies in social psychological research*. New York: Wiley.

Kirk, J., & Miller, M. L. (1986). *Reliability and validity in qualitative research*. Newbury Park, CA: Sage.

Krebs, S. (1975). The film elicitation technique. In P. Hockings (Ed.), *Principles of visual anthropology* (pp. 283-302). Aldine: Chicago.

Lancy, D. F. (1993). *Qualitative research in education: An introduction to the major traditions*. New York: Longman.

LeCompte, M. D., & Preissle, J. (1993). *Ethnography and qualitative design in educational research* (2nd ed.). San Diego: CA: Academic Press.

Manning, P. K. (1987). *Semiotics and fieldwork*. Newbury Park, CA: Sage.

Marshall, J., & Brigard, E. (1975). Idea and event in urban film. In P. Hockings (Ed.), *Principles of visual anthropology* (pp. 134-142). Aldine: Chicago.

McCarty, M. (1975). McCarty's law and how to break it. In P. Hockings (Ed.), *Principles of visual anthropology* (pp. 45-51). Aldine: Chicago.

McDonald, D. (1989). Visual ideology: Analysis of visual material. Session at the Amsterdam Conference on Visual Anthropology and Sociology, as reported in *Visual Sociology Review, 4*, 117-126.

McDougall, D. (1975). Beyond observational cinema. In P. Hockings (Ed.), *Principles of visual anthropology* (pp. 109-124). Aldine: Chicago.

Mead, M. (1975). Visual anthropology in a discipline of words. In P. Hockings (Ed.), *Principles of visual anthropology* (pp. 3-10). Aldine: Chicago.

Mehan, H. (1979). *Learning lessons: Social organization for the classroom*. Cambridge, MA: Harvard University Press.

Mehan, H. (1982). The structure of classroom events and their consequences for student performance. In P. Gilmore & A. A. Glatthorn (Eds.), *Children in and out of school*. Washington, D.C.: Center for Applied Linguistics.

Mehan, H. (1992). Why I like to look: On the use of videotape as an instrument in educational research. In M. Schratz (Ed.), *Issues in qualitative research*. London: Falmer Press.

Nichols, B. (1991). *Representing reality: Issues and concepts in documentary*. Bloomington, IN: University of Indiana Press.

Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.), Newbury Park, CA: Sage.

Pellegrini, A. D. (in press). *Observing children in their natural worlds*. Hillsdale, NJ: Lawrence Erlbaum Pub.

Pfaffenberger, B. (1988). *Microcomputer applications in qualitative research*. Newbury Park, CA: Sage.

Prost, J. H. (1975). Filming body behavior. In P. Hockings (Ed.), *Principles of visual anthropology* (pp. 325-363). Aldine: Chicago.

Psathas, G. (1990). *Interaction competence*. Lanham, MD: University Press of America.

Ratcliff, D. (1995). An elementary school hallway: Social formations and meanings outside the classroom. Doctoral dissertation, University of Georgia. (University Microfilms No. 9531229)

Raymond, C. (1991). Videotaped data pose legal and ethical problems for social scientists. *The Chronicle of Higher Education, 37* (28), A9.

Robinson, W. S. (1951). The logical structure of analytic induction. *American Sociological Review, 16*, 812-818.

Rollwagon, J. (Ed.) (1993). *Anthropological film and video in the 1990's*. Brockport, NY: The Institute, Inc.

Rollwagon, J. R. (1989). Visual studies of rural life. Session at the Amsterdam Conference on Visual Anthropology and Sociology, as reported in *Visual Sociology Review, 4*, 113-116.

Rouch, J. (1975). The camera and man. In P. Hockings (Ed.), *Principles of visual anthropology* (pp. 83-102). Aldine: Chicago.

Sandall, R. (1975). Ethnographic film documents. In P. Hockings (Ed.), *Principles of visual anthropology* (pp. 125-132). Aldine: Chicago.

Schaeffer, J. H. (1975). Videotape: New techniques of observation and analysis in anthropology. In P. Hockings (Ed.), *Principles of visual anthropology* (pp. 253-282). Aldine: Chicago.

Seaman, G., & Williams, H. (1992). Hypermedia in ethnography. In P. I. Crawford & D. Turton (Eds.), *Film as ethnography*. New York: Manchester University Press.

Segall, R. G. (1990). Learning constellations: A multimedia ethnographic research environment using video technology for exploring children's thinking. Unpublished dissertation. Cambridge, MA: MIT Media Laboratory.

Sorenson, E. R., & Jablonko, A. (1975). Research filming of naturally occurring phenomena: Basic strategies. In P. Hockings (Ed.), *Principles of visual anthropology* (pp. 151-161). Aldine: Chicago.

Suchar, C. (1991). President's column. *Visual Sociology Review, 6*, 3.

Tsao, P., Hale, M., & Fan, H. (1994). Workshop: Videotape Data Analyzer--Introducing an interactive software for helping analyze videotape data. Paper presented at the Seventh International Qualitative Research in Education Conference, Athens, GA.

Van der Does, P., Edelaar, S., Gooskens, I., Liefting, M., Van Mierlo, M. (1992). Reading images: A study of a Dutch neighborhood. *Visual Sociology, 7*, 4-67.

Young, C. (1975). Observational cinema. In P. Hockings (Ed.), *Principles of visual anthropology* (pp. 65-80). Aldine: Chicago.

Znaniecki, F. (1934). *The method of sociology*. New York: Farrar & Rinehart.

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