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.

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