

Soundscape Studies: Listening with Attentive Ears

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For most children, growing up in an industrial nation means living in an increasingly noisy urban environment. Not only must their ears contend with the mechanized noise of the street, but also the damaging sound of electroacoustic devices such as cell phones, stereos, movie theater sound systems, boom cars, home stereos, computer games, and the list goes on.

R. Murray Schafer, a Canadian composer and educator, noted "Noise is a much bigger problem today than it was ever before. And so it is in the midst of the present cacophony that we've begun to listen very carefully to what is taking place around us with the hope that if enough people can be made aware of the facts, changes might be demanded and eventually brought about."

Becoming an attentive and critical listener is a learned skill toward which soundscape studies can contribute. Such study focuses on purposeful listening to all types of acoustical environments --from those of daily life, the world of nature, other cultures and places, to those audio soundscapes constructed for media, museums or virtual spaces. It also encourages action in the preservation, modification, or creation of acoustic environments when needed.

Understanding Sound

The following material explores the nature of hearing, listening as a skilled behavior, and how some basic ear training activities can enrich students' understanding of what they hear and how they can use media to explore the soundscape and create audio experiences for others.

Hearing

The ear is a remarkable sense organ. It is able to hear a range of frequencies from about 20 Hz - 20 kHz. To gauge this range there are some low frequency sounds below 20 Hz that elephants, hippos, and other animals make that human ears cannot hear. There are higher pitched sounds such as those made by bats, or the simple dog whistle, that are well beyond the upper 20 KHz limit of human hearing. In between are all the sounds which give form and definition to the acoustic world in which we live. And, although we may not hear some sounds other creatures do, we have a hearing range adequate for human survival.

The amplitude or loudness of a sound is also considered when discussing the hearing process. The energy involved in making a sound is measured as decibels (dB). The decibel scale begins with "0 dB" which is the threshold of human hearing and proceeds upwards to the threshold of pain at about 120 -130 dB. The sound of falling leaves registers below 10 dB. A roaring jet engine fifty feet away tips the scale at nearly 140 decibels.

Anything 80 decibels or higher is potentially damaging to the ear. Sustained exposure to loud sounds without ear protection may actually tear the eardrum. This becomes an issue when kids on the school bus wear headphones pumping out close to 110 dB at full volume, or are at a rock concert with decibel ratings often peaking higher. We naturally lose some ability to hear the higher frequencies with age. But the additional damage caused by today's noisy environments is evidenced when young presidents, rock musicians, and college students share hearing problems early on in life.

Loud sound seems to be everywhere in our culture and amplification makes it even louder. Boomboxes drown out bird song in the local park. Movie theaters crank up the volume for a two-hour body vibrating experience. A neighbor's stereo system bounces pictures off your living room wall. It is amazing the amount of noise people create. Even more curious is the amount of noise people put up with!

Listening

Whereas hearing is the passive ability to receive sound, listening is a deliberate process by which sound is given meaning. Listening is a learned skill. An attentive listener is one who has developed strategies for detecting the difference between sounds, recognizing patterns, and giving meaning to what is heard. Just as we learn to see we learn to listen.

Barry Truax, in his book *Acoustic Communication*, suggests that there are three levels of listening.

1. **Background listening**, exemplified by such examples as studying while the radio is playing, or shopping or eating out with canned music as background,
2. **Listening-in-readiness**, an intermediate type of listening that includes anticipating the arrival of a boyfriend's car in the drive, or a phone call from the new girl just met that day.
3. **Listening-in-search**, is the most active form of listening with examples including a blind student tapping a cane for acoustic information, a mother listening to hear a child at night, or perhaps a family waiting for the distant sound of a train bringing home a loved one for the holidays.

Encouraging the development of listening skills is critical for children who live in a complex world of image and sound. Ear training is a task that the field of acoustic-ecology has encouraged through soundscape study programs. Soundscape study is an emerging area within both music and environmental education that should be of interest to media educators who teach about audio and visual media in our culture.

Studying the Soundscape

Soundscapes are acoustic environments that include both natural and human-made sound. Soundscapes are experienced by hearing, rather than by seeing. They may vary dependent upon the sound making factors that are a part of the soundscape at any given time - such as the introduction of a radio into a quiet mountain campground.

We can think of the soundscape as a continuum. At one end is a hi-fi soundscape in which the environment has relatively few competing sounds. It is as if the soundscape is naturally balanced. We often find such soundscapes in wilderness areas.

At the other end of the continuum is a low-fidelity (low-fi) soundscape in which most children live today. Such an environment is cluttered with an array of sound often blending together into an ear bending experience. The home provides a good example of a low-fi soundscape. Not only are there the sounds of on-going human interaction but the background ambience of family pets, TV, stereo, washing machine, dishwasher, microwave hum and beeping, vacuum cleaner, telephone, blender, and other appliances frequently all activated at the same time!

The study of the soundscape is about the development of attentive and critical listening skills. It is being able to deconstruct and respond to what is heard. It is about appreciation, preservation, and the construction of solutions where the acoustic environment is in danger or may create harm. Soundscape study is about ear training.

Ear Training: *Practical Activities*

If we had earlids we could close them in response to unpleasant sound. But our ears are functioning twenty-four hours a day, seven days a week. Given that children fill many of those hours with music, film, television, concerts and other sound experiences it becomes valuable for them to understand the influence of sound in their lives - including mechanical, electroacoustic and natural. Here are some basic ear training exercises to help students become attentive and critical listeners.

"Earplug" Practice

Limiting one's ability to hear sound provides an initial exploration into listening. Have students begin the activity by listing what sounds they can hear as they sit in the classroom. Then provide each with a set of earplugs that they can roll up, put into their ears and let expand slowly canceling out the acoustic world they have known. Ask students to describe what they think they can hear after about five minutes after insertion and then again about 20 minutes later. Then have the students remove the earplugs and immediately list everything they hear. The results will be amazing.

With their ears plugged students will begin to give attention to their own body sounds. Heart beat, breathing, anything that touches the conductive surface of the skull will all be given attention by the ear.

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—R. MURRAY SCHAFER

With ears unplugged the room will come alive with sound. In some situations students may find that their classroom is subjected to many external acoustic events such as aircraft, busy street traffic, air conditioners and even perhaps amplified music from a radio or stereo. They may not have given this external soundscape attention until now and it may be disturbing.

Research has shown that children who attend school in noisy environments suffer cognitive development problems (Bronzaft, 2000). A school located near an elevated commuter rail, or in an airport flight path, may experience a soundscape of loud noise that is not only distracting but can actually cause stress, illness, and learning disabilities in children.



On International Noise Awareness Day 1999, two hundred students in Wiesbaden, Germany walked through the city and did nothing but listen for their city's "soundscape." PHOTO BY JURGEN HELLER.

A "Soundwalk"

Soundwalks are another way to introduce children to the acoustic environment. A silent walk is undertaken without any speaking allowed. The focus is on purposeful listening that includes, listening in readiness and listening in search for acoustic events along the walk.

Design a soundwalk that leads children through a variety of soundscapes from inside, outside, and around the school and if possible into the neighborhood. When the class returns have the students write down what they heard and then lead a discussion in which perceptions of the walk are compared. See if students heard different things on the walk. Then ask why attention was given to some sounds and not others.

An alternative soundwalk, if done safely, is to lead children on a listening walk where each individual is blindfolded. Without sight students become blind listeners. This can lead to a discussion about blind listening to radio plays, books on tape, audio stories and informational programs. Talk about how the ear must give constant attention to what is heard in order to make sense. Blind listening experiences often stimulate interest in audio, radio, and soundtrack design as well as blindness itself.

"Sound Journal"

Asking students to keep a daily sound journal for a week will reveal to a child the uniqueness of the soundscape in which he/she lives from early morning until bedtime. Ask children to focus on sounds that dominate the soundscape and those that are hard to hear. Given that this activity may take place in a media studies course, the teacher could ask students to give special attention to the use of audio media in all sorts of environments: schools, movie theaters, shops, malls, restaurants, swimming pools, and other places where kids spend time. Many will note that the sound of TV, radio, stereos movie theaters, boom boxes, background music in stores, tend to dominate. Bird song, the wind, rain, animal and other sounds may be those most hard to hear or lost all together in the urban environment.

"JUST AS WE LEARN TO SEE,
WE LEARN TO LISTEN."

Ask students, in review, what sounds they would like to keep as part of the environment in which they live. Ask which sounds they might like to quiet down or eliminate. Such discussions may lead into some interesting topics such as should cell phones be banned in movie theaters? Are boom boxes annoying? Or, should neighbors be allowed to play their stereo so loud that neighbors can hear it?

As listening skills develop, return to the task of journal writing. Only this time focus on listening to constructed sound environments as found in the sound tracks of children's TV and movies, nature shows, anything children will watch, perhaps even video games, and cartoons. Analyze the soundtracks according to how they have been designed sonically/musically. What is different about the soundscape of a TV program that is different from that of daily life? One answer might be the use of laugh tracks. Another would be the use of music to make scenes more emotional.

Other Experiments

Sound, like color, can be wonderful to discover. Consider experimenting with the construction of audio works using tape recorders and hand made or pre-recorded sound effects. I have found students fascinated with the making of audio skits or plays on tape. Often it is the first time that they have given their ears the challenge of listening and understanding a story told only through sound. In an age of images we often give sound second place in our deconstruction and construction of media messages.

Constructing Audio Requires Ear-minded People

There are many professionals who are aware of the soundscape as artists. Sound sculpture, sonic environments for museums and aquariums, composers, and sound designers for film and media are all ear minded people and attentive listeners. Encouraging children to become involved in the construction of audio messages provides a balance to analysis and deconstruction activities.

The production of audio documentaries fits nicely within soundscapes studies. Students take audio recorders into the field and document a time, place, or event. Narrative may be added or interviews included. An example might be an interview with grandparents or other seniors about the sounds of the environment when they were young. Or, perhaps kids might produce an audio document of a city festival in which one hears a montage of people, music, and events of the day. Digital editing on the computer using commercial programs such as Peak® or a free audio cross-platform editor like Audacity (<http://audacity.sourceforge.net/>) makes the production tasks easy.

Children might also write and produce an audio play. A script with dialogue and needed sound effects is developed. The actors stand around a microphone (a PZM microphone is recommended) and act their part with vocal emphasis. Other students make sound effects using items such as cellophane for fire, an oil drip pan for thunder, coconuts for horse hooves, or other found materials that can be used for Foley effects. Sound effects from CD's can also be cued up and played at the right time. I have effectively used a programmable sound effects generator sold at Radio Shack for under \$100.00 that offers a wide selection of effects activated with the push of a button.

Students who have grown up on television are amazed at how exciting they can make an audio play. There is no need for visuals, make-up, costumes, or other resources required of a student video production. Given that few students have heard radio plays they are more pleased than not with their work, for there is no preconceived standard against which to judge their efforts as there is with video.

Conclusion

Just as one learns to see one learns to listen. The ability to use both senses well requires practice and training.

We tend to think of visual artists as those individuals who have a special ability to see the world in unique ways. Composers and musicians are considered to have a unique ability to hear and think in terms of sound. In truth, each child is able to enhance the ability to see and communicate through visual media. In truth, each child is able to enhance the ability to listen and communicate through audio media.

Soundscape studies open a new avenue for learning how to listen that provides ear training activities that benefit students in many ways. •

REFERENCES

- Berendt, Joachim-Ernst. *The Third Ear: On Listening to the World*. New York, An Owl Book - Henry Holt and Company, 1985
- Bronzaft, Arline L. "Acoustic Ecologists and Environmental Psychologists: Working Toward a Quieter and Healthier Soundscape." *Soundscape: Journal of Acoustic Ecology*, Volume 1, Number 2, Winter 2000, pages 24-26.
- Giansante, Louis. The Soundscape: What it is, How It Works, and Why it's Important. *Media and Methods*, November, 1970. Pages 43-47.
- Giansante, Louis. Sound Study. In edited by Kit Laybourne and Pauline Cianciolo, *Doing the Media*, Center for Understanding Media. New York, 1978
- Giansante, Louis. Doing Audio Tape. In edited by Kit Laybourne and Pauline Cianciolo, *Doing the Media*, Center for Understanding Media. New York, 1978
- Schafer, R. Murray. *Voices of Tyranny/Temples of Silence*. Aracana Editions, Indian River, Ontario, 1993.
- Schafer, R. Murray. *A Sound Education: 100 Exercises in Listening and Sound Making*, Indian River, Ontario, Aracana Editions, 1992.
- Schafer, R. Murray. *The Soundscape: The Tuning of the World*. Rochester, Vermont, Destiny Books, 1993.
- Soundscape: The Journal of Acoustic Ecology, Education-Listening-Learning, Volume 2, Number 2, December, 2001.
- Truax, Barry. *Acoustic Communication*. Norwood, New Jersey, Ablex Publishing Company, 1984.
- World Forum for Acoustic Ecology, <http://interact.uoregon.edu/wfae/home/index.html>