Acoustic Ecologists and Environmental Psychologists: Working Toward a Quieter and Healthier Soundscape

by Arline L. Bronzaft, Ph.D.

The acoustic ecologist and the environmental psychologist have much in common; both are concerned with the role of sound in people's lives. However, due to different educational backgrounds and experiences, the acoustic ecologist focuses to a greater extent on listening as a way to know and understand the sounds in the environment; the environmental psychologist is more interested in learning how these sounds affect people, especially those that are labeled noise. Despite their differences, acoustic ecologists and environmental psychologists would agree that the sounds around us have grown more unpleasant. Both would also concur that the health and well-being of all people depend on eliminating the harsh and piercing sounds which are dominating our aural environment. Acoustic ecologists and environmental psychologists should join forces in educating people about the dangers of these sounds and the fact that—as a result of noise—so many natural, beautiful and useful sounds have been cast into the background of our perception. This collaboration could go far in fostering a healthier soundscape for all of us. To paraphrase R. Murray Schafer: If the acoustic environment is a musical composition, then it is up to us to create a beautiful one.

Environmental Psychologists Work In the Field

Before such a collaboration can be forged, it would be important for environmental psychologists and acoustic ecologists to learn more about each other's educational perspectives. For those readers of *Soundscape* who are already familiar with acoustic ecology, some information about the field of environmental psychology should prove worthwhile. Hopefully, an acoustic ecologist will be afforded a similar opportunity to write for an environmental psychology journal.

In order to examine the effects of a specific place on the individual, environmental psychologists frequently work in the field—e.g. playgrounds, housing projects, transportation centers, classrooms—rather than in the laboratory. They examine actual problems such as air pollution, overcrowding, noise, energy conservation. While committed to developing and testing out theories as they conduct their research, environmental psychologists are also interested in having their research findings applied to improve the human condition.

Environmental psychologists frequently work with researchers in other disciplines, such as urban design, architecture and geography. As a result their research findings are disseminated more widely and in addition they often are used by lawmakers and other administrative officials in the formulation of public policies. For example, research that demonstrated a relationship between increased vegetation and reduced crime in a Chicago public housing project led the Housing and Urban Development agency to promote "green public housing."

Selecting Noise as a Research Issue

As an environmental psychologist living in New York City, I decided to focus my attention on a problem that has been identified by the Police Quality of Life Hotline as the number one complaint—NOISE. Congested highways, crowded high-rises, and a subway that thunders past the homes of hundreds of thousands of people make New York City a noisy place to live in. Can't we do something to lessen the noise of the subways, limit the numbers of cars on our roads, and pass zoning laws to stop the proliferation of high-rise buildings in overdeveloped communities?

Pondering the fact that the noise of New York City was harmful to its inhabitants, especially the children, I gave serious thought to conducting a study on the effects of elevated train noise on children's learning. The opportunity to carry out such a study was provided by a school principal. He believed that the students in his school who attended classrooms lying adjacent to elevated train tracks were being adversely affected by train noise. What made this school an ideal site for research was the presence of a group of classrooms on the other side of the building that did not face the tracks.

Comparing the reading scores for these two groups of children, one on the noisy side and the other on the quiet side, I discovered that by the sixth grade, the children on the noisy side were about one year behind in reading (Bronzaft and McCarthy, 1975).

Translating Research into Activism

Not content with merely publishing my findings in an academic journal, I asked the principal, the press and public officials, to assist me in convincing the Board of Education and the Transit Authority to do something about the noise. Much to our surprise the Board of Education installed acoustic ceilings in the noisiest classrooms and the Transit Authority selected the track near the school as the testing site for new rail seat fasteners that were supposed to lower the noise on tracks. When these two noise abatement procedures were in place, a visit to the school demonstrated that the noise in the classrooms facing the tracks was considerably lessened. More importantly, when the reading scores of the two groups of children—those in classrooms facing the tracks and those on the other side—were compared, both groups of children were reading at the same level (Bronzaft, 1981). Yes, something can be done about noise and when the noise is abated, children's reading scores are improved. This study was helpful in getting the Transit Authority to install rubber rail fasteners throughout the system, lessening the din for the other public and private schools near their tracks as well as for the many residents who live near the elevated structure. Furthermore, the findings of both studies were used by parents in demanding noise abatement materials for schools lying within the paths of overhead jets.

My experience that research can be used to improve the learning environment for children who attend schools near noisy sources transformed me into a noise activist. Since then I have continued to work toward lowering the din in New York City and elsewhere, while still doing research and writing articles.

The Noise/Health Link

Although more research is called for to solidify the noise/health link, studies strongly suggest that noise is indeed hazardous to health (Passchier-Vermeer and Passchier, 2000; Evans and Lepore, 1993; Fay, 1991). It has generally been accepted that loud noises may impair hearing. With respect to other physiological and psychological effects of noise, there are enough data to support the issuing of warnings by government agencies that noise could slow down children's cognition, language and learning skills; that it could bring about cardiovascular ailments mediated by stress; that it disturbs sleep, and diminishes one's quality of life.

Noise disturbs millions of people around the world and cannot be dismissed as an annoyance with which one has to learn to live. In a study on the effects of aircraft noise on individuals living near a major international airport (Bronzaft, et al. 1998), we learned that their "quality of life" is seriously impaired. These residents cannot sit in their back yards, open their windows, watch television, listen to the radio or converse with others in their homes without intrusive aircraft noises. They are not yet made ill by the noise but they are not enjoying a "healthy quality of life" either.

Government's Responsibility in Noise Abatement

There is a United States agency charged with protecting workers' hearing in industrial settings, but there is no official agency dedicated to alerting citizens to the dangers of community noises. Thirty years ago there was one. In the 1970s the government's *Office of Noise Abatement and Control* distributed reading materials identifying noise as a health hazard and encouraged its abatement. There was an awareness that noise was a health pollutant. However, in 1982 then President Ronald Reagan closed this office. Without this overseeing federal agency to support noise education and abatement, city and state agencies lacked the support to continue their initiatives in this area. Benefitting from this change of policy were the noise-makers, especially the aircraft manufacturers, who no longer had a government agency looking over their shoulders. Thus, they could work at their own "slow pace" in quieting planes, engines, tools, and even children's toys.

During the past twenty years, the United States has become even noisier and the federal government has largely ignored the issue, despite legislation passed in 1970 to protect its citizens from harmful effects of noise. Although some efforts have been made on the international level—especially through the *World Health Organization*—to identify the impacts of community noise, governments worldwide still pay too little attention to the issue. This is true at the federal level as well as the local level.

Threshold of Hearing	0 dB(A)	Teacher's Voice (average)	65 - 70 dB
Normal Breathing	20 dB	Inside car	70 dB
Quiet Whisper (1 m)	30 dB	School computer rooms	73 - 79 dB
Classroom (recommended for effective learning*)	35 dB	Subway (inside)	94 dB
Quiet Home	40 dB	Diesel truck (10 m)	100 dB
Quiet Street	50 dB	Elevated train (30 m)	120 dB
Typical classroom	55 - 75 dB	Amplified Rock Music (2 m)	120 dB
Normal Conversation	60 dB	Jet plane (30 m)	130 dB

Decibel Table: dB(A) levels of some relevant sounds[1]

Citizen Coalitions Battling Noise Pollution

Recognizing that governments, for the most part, are failing them in reducing community noises and as a result are robbing them of a decent quality of life, citizens have formed coalitions such as *Sane Aviation for Everyone* in Queens, New York and *Noise Network* in London. These groups have become knowledgeable about many aspects of noise, such as measurements, health impacts, and existing legislation. They are assisted by organizations such as *The League for the Hard of Hearing* (New York City) and the *Noise Pollution Clearinghouse* (Montpelier, Vermont). Professionals from a variety of fields also have contributed their expertise to anti-noise groups, especially by providing testimony at hearings, or writing responses to environmental impact statements. The anti-noise groups, the professionals and the organizations cited above have been urging legislators to pass bills to curb noise. They recognize that activism is essential if we are to bring about a quieter, healthier soundscape.

Noise Drowns Out the Pleasant Sounds Around Us

The individual who is stressed out by overhead jets or the person who can't enjoy her waterside home because of her neighbor's noisy windmill, may join neighborhood coalitions, like those mentioned above, to quiet the din or they may work on their own to lessen the noise. Much of their energy is focused on *reducing the noise* that has intruded upon their lives. However, both these individuals, if they were given time to think about it, might also acknowledge that the noises have drowned out some very *pleasant sounds* in their environment. In Queens, New York, a mother living in a very lovely neighbor-hood comments that when the planes are not above she pays attention to the singing of the birds in her backyard. The woman who was bothered by the windmill spoke of how she missed listening to the waves breaking against the shore. Apparently, the horrendous sounds have made it difficult for them to tune in to the more subtle sounds that surround them.

Even I, who live in Manhattan, can enjoy birds singing early in the morning before the blaring traffic sounds and the construction crew's tools invade my apartment. Once the jackhammers start, I no longer can enjoy the gentle rain falling on my windowsill nor can I play my stereo at a level that is soft and enjoyable. Hopefully, the jackhammers will stop when the repair job next door is completed and I can listen once more to music as I read, rest, or write. The best I can do about the traffic is to advocate for better public transportation and to offer testimony at public hearings that our community does not need additional tall buildings, which will only bring in more traffic to our neighborhood.

A Quiet Home Promotes Academic Success

My interest in sound also includes times of quiet or silence. In my book *Top of the Class* (1996) I queried over 2,000 high academic achievers—most over the age of fifty years and all members of the Phi Beta Kappa honor society—to learn how they fared professionally

and personally later on in life. Asked about their childhood homes through questionnaires and interviews, they reported that their parents respected quiet in their homes, providing them with quiet places in which to study, read and reflect. This undoubtedly contributed to their academic, professional and personal success. Discipline also was quieter; not with shouts and raised voices but generally done with stern looks and soft voices. Television sets and radios did not blast away in the background when the family was at the dinner table, allowing parents and children to converse and exchange information on the day's happenings.

Noise Pollution and the Soundscape

Although my work is still centered on noise, more recently, largely due to the friendships I have made with acoustic ecologists, I feel strongly that people must be taught to become more aware of the sounds in their environment. It is not enough to rid the environment of ear-shattering noises. One must also understand that sounds can contribute significantly to the enjoyment of life. I agree with Hildegard Westerkamp (2000, 4) that the "focus should not be limited to 'fighting noise' but on gaining knowledge and understanding of the soundscape as a whole, its meanings, its behavior, and all living beings' behavior within it." It is here that I believe acoustic ecologists and environmental psychologists can work well together. The ecologists are adept at attending and listening to the soundscape; the psychologists are skilled in assessing the impacts of sounds on people as well as measuring their interests in and attitudes towards different sounds. Working together they could provide greater knowledge of the soundscape and its effects on people, as well as the information helpful in fostering a more harmonious and healthier sound environment.

Noise pollution must be placed within the context of the larger sonic environment. Disturbing sounds would not only be seen as disruptions to ongoing activities but also as obstacles to our involvement with the wonderful soundworld around us. As R. Murray Schafer proposed in his book *The Tuning of the World* (1977), the study of sound should be a positive undertaking rather than the negative one now employed in the exclusive study of noise. Acoustic ecologists could engage environmental psychologists in exploring how sounds influence our attitudes, interests and behaviors. Such research, in placing the emphasis on the worthiness of studying sounds and their influence on human health and well-being, would by its very nature create greater demands to curtail those intrusive and disturbing sounds, precisely because they prevent us from using our ear and mind and perceiving the worthy sounds around us.

Kendall Wrightson (2000) bemoaned the fact that R. Murray Schafer's philosophy, that served as the underpinning of acoustic ecology, was unknown to the general public as well as acoustic environmentalists. The work of acoustic ecologists could gain greater recognition and respect in their collaboration with environmental psychologists who have traditionally interacted with a wide network of professionals from different fields. Gernot Böhme (2000) asked for the abandonment of the narrow approach which studies noise as a function of decibels rather than examining the "… type of acoustic character the spaces in which we live should have." By learning more about the area of environmental psychology, acoustic ecologists will discover that psychologists do not merely study noise as a "function of decibels" but rather as a way to advocate for an acoustic environment that will benefit humans. This might serve to encourage the ecologists to become activists.

Acoustic Ecologists as Activists

At the acoustic ecology conference in Stockholm in 1998, *From Awareness to Action,* a resolution called for the creation and enforcement of legislation to protect the acoustic environment and the public health. Such legislation, which undoubtedly would include efforts to ameliorate noise, can only come about by educating public officials and citizens about the dangers of noise. Through these efforts, the value of a healthy soundscape could also be promoted. Claude Schryer (1999, 14) referring to the above resolution and three others passed, asked: "Will these resolutions change the world?" My answer is I don't know, but of one thing I am certain. They can only make an impact if people other than the delegates to the Stockholm conference are aware of them. Since the resolution was passed in 1998, how many attendees to that conference have worked to enact the legislation to protect the acoustic environment? If the answer is "very few," then fostering a relationship with environmental psychologists, who have experience in working with citizen groups, policymakers, and the press would most assuredly aid acoustic ecologists in giving the Stockholm resolutions greater profile. Ultimately these resolutions may help to initiate legislation that will create a safer and more beautiful acoustic environment.

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1. Table data Sources: Truax, *Handbook for Acoustic Ecology* CD-ROM; League for the Hard of Hearing <http://www.lhh.org/>; and *Acoustical Society of America's Response to Federal Access Board's Request for Information on Classroom Acoustics http://www.nonoise.org/quietnet/qc/other/letters.htm