
Acoustic Communication

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I have attempted in my book "Acoustic Communication" * to give the field an intellectual basis. That basis can be understood as a twofold critique, firstly, of traditional disciplines that study some aspect of sound, and secondly, of the social science inter-discipline of communication studies itself. This latter critique is based simply on what I have found to be a "blind spot" in the social sciences regarding any subject involving perception. With the traditional disciplines, what is most striking is the way in which the study of sonic phenomena has been fragmented across nearly all areas of academic discourse. Each area proceeds from its own theoretical models and methodology, using its own terms and language, essentially getting the "local picture" correct but ignoring the landscape (or soundscape) as a whole. In addition, and here we see a common thread with the stance of other emerging inter-disciplines, acoustic communication finds its justification in that contemporary problems related to sound and audio technology are not well handled by the traditional approaches. Problems such as noise pollution, the impact of the audio industry and the use of sound in media, the apparent decline in listening abilities, and so on, seem insurmountable, except in localized ways, with traditional methodology.

From a theoretical perspective, I have suggested that a new model, one which I call a communicational approach, is needed. The traditional models have been based principally on the notion of energy transfer as found in the physical sciences. Sound and its behaviour is modelled as a series of energy transfers from the source, through the medium, to the receiver and finally to the brain, ending perhaps with a final emotional dissipation of the energy as annoyance and pleasure. Audio engineering substitutes an analogous series of signal transfers to describe the way in which sound is converted (i.e. transduced) from its physical, acoustic form to an electric signal, then stored, processed or transmitted, and finally reconstituted at the "receiver's" end. Similarly, classical psychophysics treats the auditory system's processing of incoming stimuli as a series of stimulus-response reactions. Music and linguists are largely concerned with the internal workings of the phenomena they have defined as within their domain, but most of their theory seems to be based on some kind of linear transmission model, with an emphasis on performance strategies.

The consequences of the base model of each discipline can perhaps best be seen at the level of its corresponding design theory. Acoustical engineering, for instance, when concerned with problems of noise, deals mainly with acoustic energy at the source and in the process of propagation, or else, it advocates isolating the receiver or otherwise modifying the sound to minimize unwanted effects. An interesting case of the applied use of psychophysics is the Muzak industry, with all of the attendant controversy surrounding the manipulative use of sound for specific effects. Architectural acoustics seems caught up in the complexities of achieving good acoustics in well-defined situations such as spaces for speech and music transmission; it hardly considers less controlled situations in which quantitative and qualitative criteria have not been agreed upon. And music, which Herbert Simon calls "one of the oldest sciences of the artificial", is still largely concerned with matters of musical style, analysis of artifacts (the score), abstract works of art that are thought to exist independent of cultural context, and analytical models that assume an idealized listener that scarcely can exist today given the impact of noise, mass media consumption, and audio consumerism.

The theory of acoustic communication substitutes information for energy or signals as the basic "unit" of its model. Hence, since information is the result of cognitive activity, listening is placed at the centre of the process, not at some final stage of a series of energy/signal transfers. The linear transportation model of signals, in turn, is replaced with the notion of sound as mediating the relationship of listener and environment, where the direction of influence can proceed in both directions. That is, the communicational situation can be modified, either with a change in the physical environment itself, or simply with the listener's perceptual habits. And finally, the notion of context, which is frequently ignored in traditional models, is given a central place in acoustic communication, in the sense that sonic information is dependent both on the nature of the sound itself and its context.

It is impossible to sketch out all of the applications of this new theory, but perhaps it is clear that by being more listener centred and context sensitive, acoustic communication will approach problems in less of a linear "effects" manner, and give more emphasis to relationships and processes. In short, it will attempt to deal with the complexities of a communicational situation. It uses all of the knowledge garnered from the traditional disciplines, with its validity limited by the assumptions under which it was created, but proposes a larger, more encompassing framework for understanding the contemporary world.

In particular, the model of acoustic communication provides fresh insight into the impact of technology that is as troublesome within the modern context. Traditional audio theory is based on an assumed neutrality of technology whereby if the transmission of the audio signal is perceived (or measured) to have "fidelity" to the original, then it is thought to have been successful. Besides ignoring any responsibility for content, this model also ignores the inevitable fracture in context (what R.M. Schafer terms "schizophonia") that exists between the original source and its later out-of-context reproduction. A similar philosophy of neutrality is embodied in the use of sound effects that are synchronized to appear "natural" and emotive music that assumes we all feel the same reaction to a scene (or if not, we will be made to).

Acoustic communication, on the other hand, assumes the inevitable artificiality of the situation, and notes the new relationships (often consumer oriented) that are created by these supposed "extensions" of acoustic phenomena. From a design perspective, the imperative is based less on the manipulative use of sound for its effects, and more on an exploration of the sound material itself and ways in which the listener can achieve new levels of understanding the world through sound. In short, one tries to look past the marketplace hype which promotes everything as new, but instead hides endless repetition of the same, to find situations where technology achieves a net gain in that it changes the process of communication.

The above is an excerpt of an article to be published in a book on the nature of interdisciplinary research edited by Liora Salter and Alison Hearn. Barry Truax teaches in the Dept. of Communication, Simon Fraser University.

*(Ablex Publishing, [1984], 355 Chestnut St., Norwood, NJ 07648 USA)