

COST Action TD0804

WP2 – Collecting and Documenting

Truls Gjestland
SINTEF ICT, Trondheim, Norway

Danièle Dubois
CNRS, LAM/Université de Paris, France

Summary

A progress report on the work in the COST action on soundscapes will be presented. Work package 2 deals mainly with documentation. An exploratory inquiry on linguistic resources and uses has been carried out. Preliminary results from this study will be presented. The study allows the identification of the present definition of *soundscape* and it emphasizes the need for a more controlled approach for collecting and processing verbal data for assessment of soundscapes across languages in Europe. It aims at the development of a multi-lingual dictionary on soundscapes in order to do comparisons across different national studies. Accurate verbal data related to physical measurements and modelling is required to fully account for the description of soundscapes and thus to be used for future soundscape design.

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1. Introduction

Soundscape has become a new buzz-word that in many ways erroneously has replaced other well-known issues dealing with noise and sound. A variety of people with very diverse backgrounds now get involved in *soundscape studies* but there is not yet an agreement of the concept *soundscape* as such. There is a growing and uninformed use of *soundscape* as a synonym for *community noise*. Conventional noise control engineering becomes *soundscapeing*, and noise maps that were produced according to the European noise directive become *soundscape maps*. Modern artists and composers create *soundscape installations*, and good *soundscape* has become a hot topic in concert hall design. However, there is never the less an evolution away from noise studies to real soundscape studies.

The COST action: *Soundscape of European Cities and Landscapes* was established mainly as a result of previous *noise* studies. More and more people throughout Europe are affected by noise that causes annoyance and negative health effects, and

scientists and authorities have realized that these problems can not be solved by merely trying to reduce the noise. Noise reduction is not always feasible and cost-effective, but more importantly, reducing the noise per se, will not necessarily lead to improved quality of life and people's satisfaction.

Soundscape research is about the relationship between the sound environment, its perception by human beings, and the society. Soundscape studies deals not only with the physical phenomenon: sound in an environment, but also how this is perceived, experienced and interpreted by a person present. It covers physical science, engineering, psychological and social science, medicine and art. Soundscape research represents a shift in that it considers environmental sounds as a *resource* rather than a *waste*, and therefore soundscape studies deal with both positive and negative values.

The research that is being carried out under the COST Action TD0804 has been concentrated on the environmental sound quality aspects of soundscapes rather than the more artistic sides.

2. WP2 - Collecting and Documenting

Within the COST Action TD0804, WG2 has been dedicated to “collecting and documenting”. Due to diversity in background the members of the working group had initially very different views about what should be “collected and documented”. As an example: should we collect *recordings of different sounds* for future use in demonstrations or sound installations?

In Work Package 2 we have been concentrating on collecting material for verbal assessment of soundscapes and soundscape preferences in an attempt to compile a multi-lingual dictionary to facilitate comparisons across different studies involving the diversity of languages across Europe. A preliminary survey has been conducted among the COST members and so far we have collected responses from 15 different countries (15 different languages). The survey also includes a question on *personal definition of soundscape*. From the responses so far it is obvious that there are variations in the definition of the word.

Some members of the working group who are also active in the ongoing soundscape study in the International Standards Organization, have published an article “Toward standardization in soundscape preference assessments” [1] where some of the more basic aspects of *soundscapes* have been discussed. For instance: What is a soundscape?

These authors have settled for a fuzzy definition of *soundscape* to provide a starting framework for further discussions. For these authors, a soundscape is present in:

- A physical, mainly outdoor area/space/location (‘place’) that can be described by a set of physical parameters such as geographical coordinates, dimensions, topography, etc.
- A ‘place’ that also exhibits certain properties such as ‘landscape’, ‘nature’, man-made constructions, as well as micro-climate conditions.
- A ‘place’ with certain acoustical properties that can be described by acoustical parameters such as type of sound sources, levels, spectrum, and temporal pattern.

- A ‘place’ where people (and/or other creatures) live or occasionally spend some time.
- A ‘place’ where people may interact with the physical environment and with each other.

This is not a formal definition of a soundscape, but it may provide a starting framework.

From the WG2 survey the following items can be added to the list. The word *soundscape* accounts for:

- A *sonic/acoustical/physical* phenomenon and a *perceptual, experiential, cognitive, mental* one as well.
- A global conception that integrates a *totality* of sounds, a *combination or collection* of sounds and other physical elements that work as one “unit” (gestalt).
- Corresponding to the visual landscape, the soundscape refers to the *environment, to (large scale) places, habitat*.
- *Soundscape studies* focus on negative as well as positive aspects of sound (as opposed to noise) and relate to *quality of life*.

High priority has been given to questionnaires that have been used for soundscape preference assessments. However, such questionnaires are not readily available, and they have to be used with careful attention to language specificities.

It has therefore been proposed that the working group should initiate the establishment of a questionnaire or parts of a questionnaire to be used for social surveys of soundscape qualities, similar to the standardized questions that are being used for noise annoyance assessments. For example, a questionnaire protocol and a method for reporting soundscape results have been developed in a Swedish research program. There are, however, significant situational differences between annoyance and soundscape preference measurements that will need to be considered.

Most annoyance surveys examine human response indoors to well-defined outdoor sources (road traffic, aircraft, etc.). By contrast, the intent in a soundscape survey could be to assess human response in many different types of places, while different respondents may be participating in quite different activities, and be in that place for widely

different motivations or durations. Furthermore, annoyance surveys focus on a single outcome, the outcome of annoyance (dissatisfaction) whereas soundscape surveys may focus on any, or all, of a long list of outcomes spanning from excitement to tranquility, liveliness to peacefulness, etc. A standardized soundscape survey is therefore far more complex than an annoyance survey. Still soundscape preference measurements can benefit from the approaches that were developed for standardized annoyance surveys, as well as research from psychological exploration of human sensory judgments.

There may be other lessons for the soundscape society to be learnt from former noise studies. The annoyance response varies quite a lot between different communities, and the only logical explanation for this seems to be the fact that the noise level as such can only partly explain how annoying the noise situation is assessed. A number of other factors, acoustical and non-acoustical, contribute to the resulting dose-response function.

Fidell et al [2] have just recently presented a theory-based model for estimating the prevalence of annoyance with exposure to different types of transportation noise. Differences between communities are expressed by a decibel-like index CTI, Community Tolerance Index, which reflects the aggregate influence of all non-dose related factors on annoyance judgments in a given set of field observations. This simple index may be a way to quantify the non-acoustical factors inherent in the soundscape process. Currently the soundscape research community is looking for ways to identify those factors and new ways to quantify them.

A re-analysis of earlier noise studies from a soundscape point of view, may be worthwhile, and it may shed new light on the observed response differences.

Another high priority item is the physical documentation of soundscapes that have been assessed subjectively. City planners and decision makers seek advice on how to create good sound environments or *good soundscapes*. One of the objectives of the COST action is therefore to provide practical guidance and tools for the design of soundscapes:

- Which acoustic properties are important?
- What should be avoided? And how?

Because of the two side concept of soundscape (including both the physical description and the psychological judgment of an acoustical environment), a main issue will be to coordinate relevant research from engineering, acoustics and human sciences.

Up until quite recently good soundscape studies have often been conducted by non-acousticians. Data concerning the physical environment described by conventional acoustical parameters (levels, spectrum, time pattern, etc.) are therefore often of unsatisfactory quality or even totally missing. On the other hand, acoustically well defined environments have seldom been locations for good soundscape studies. Recommendations and specifications of minimum requirements for reporting physical parameters of a soundscape should be developed. Similarly, adequate ways of constructing questionnaires and designing methods for analysis of responses and behavioral data should be developed.

The initial objective of WP2 of the COST action was to collect and document this type of information. However, the lack of feed-back in information to be “collected and documented” has led the working group to shift their focus to development of methods and recommendation for soundscape studies.

References

- [1] A L Brown, J Kang, T Gjestland: Towards standardization in soundscape preference assessment. J. Applied Acoustics, vol 72 (6), 2011, pp 387-392
- [2] S Fidell et al: A theory-based model for estimating the prevalence of annoyance with aircraft noise exposure. Accepted for publication by J. Acoust. Soc. Am,