

SOUND CHARACTERIZATION OF URBAN ENVIRONMENT

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1. INTRODUCTION

The perceptive and acoustical characterization of sound environments constitutes an important topic in research concerning the quality of life. The traditional approach, based on sociological surveys, aims at developing indices correlated with annoyance. Such indices are usually linked with sound level [1], but more recently, other indices linked to the quality of sound have been proposed [2]. However the general methods developed for defining new indices remain sociological in essence, since only general trends are explained and individual differences remain unexplained.

On the opposite, the method presented in this paper is essentially psychological since it aims at explaining the individual differences by correlating them with differences in the mental representation of sound by the subjects.

This work has two objectives : first to identify and select environments that can allow us to establish a corpus of meaningful sounds that we can physically describe and manipulate and second to find out how psychological properties correlate with the physical parameters. Only the first objective is presented in this paper.

2. METHODOLOGY

Sociology studies have used, such as Amphoux [3], for example, query techniques in order to identify the representations of a priori selected soundscapes in different groups of users of a city. Our investigation is in some ways upstream from such a research, inasmuch as it questions what is a relevant soundscape among all the large variety of acoustic stimulations that a citizen encounters.

Inasmuch as the mental representations we want to get at are not observable, we had to elaborate adequate methodologies, borrowed from cognitive psychology and linguistics, in order to have access to them. We selected two modalities of access, a graphic and a verbal one, in close connection with cognitive research concerning the relations between mental representations and linguistic [4] or iconic representations.

Graphic and verbal representations are well known to allow access to different properties of the mental representations for visual objects [5]. We will explore here the fruitfulness of such an approach within the sound modality.

2.1 Description

The subjects were first asked to give a graphical representation (that is visual) of their acoustic representations (sounds). In a second time, they had to verbally describe their sound experiences (that is, memorized).

In order to establish a representative corpus of locations which would be of particular acoustic relevance for subjects, we carried out an exploratory enquiry in Paris. The instructions required the subjects :

1 - to establish a graphical representation of the sound space in Paris by drawing : "Qu'est-ce que le Paris sonore pour vous ?" ("What is the sound Paris according to you?") and then to verbally comment the resulting drawing,

2 - "citer des lieux ou itinéraires ayant des qualités acoustiques particulières" (enumerate locations or routes having particular acoustic features).

30 persons (17 men and 13 women, ranging from 20 to 58 years old) users of Paris have been interviewed. The interviews lasted about 30 minutes.

2.2 Data processing

The locations and activities most often mentioned were : the traffic of the ring road (24%), of Rivoli street (16%), of Place de la Bastille (24%) and the Seine banks (27%), the birds and children of the Jardin des Plantes (16%), of the Buttes Chaumont (20%) and of the Bois de Vincennes (16%), the street markets of Aligre (16%) and of Mouffetard street (20%), the bustles in the streets of Montmartre (16%), Les Halles (30%), the St-Michel district (30%) and the Parvis de Beaubourg (20%), the walks in the Marais (16%) and in Père Lachaise cemetery (24%). These locations display soundscapes that can be considered as typical of Paris and which will therefore be further involved in physical analysis, as one aim of the present research.

In order to fulfill the second aim, i.e. how the sound Paris is mentally represented, it is required to further develop a linguistic and psychological analysis of the data collected.

The verbal descriptions as well as the drawing have been analyzed according to different criteria. For the drawings, the main criteria considered were :

- the setting of the drawing within the page,
- the represented point of view,
- the type of object represented.

For the verbal description, the main criteria considered were :

- the identification of the answer,
- the list of the properties attached to each of them (among which acoustical properties, evaluations, types of "objects", time, etc.).

