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TOWARD A CHARACTERISATION OF THE SONIC ENVIRONMENT: THE METHOD OF QUALIFIED LISTENING IN MOTION

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ABSTRACT

Urban sonic environment requires an interdisciplinary approach which looks both at its physical and spatial dimensions as well as its perceptual and social dimensions. The method of "qualified listening in motion" aims, after an architectural and urban statement, to produce in situ a set of verbal accounts of perception. Starting from these first qualifications, a metrological campaign, ethnographic observations and sound recordings are carried out. The comparison of this data enable to highlight and identify specific sound indicators of the environment such as recurrent sonic effects [Augoyard, Cresson, 1995]. By including perception and action of city dwellers in context, this method makes it possible to reveal the strong temporal (events, dynamics) and symbolic (meaning, emotions, discursive) characteristics of sound in the urban environment as much in its qualitative and quantitative dimensions. This method was applied in an exploratory way to two French urban sites: the Z.A.C. Vigny-Musset in Grenoble (38) and the district of the Port au Blé in Rezé (44). This work was performed in collaboration with Nicolas Boyer under the direction of Jean-François Augoyard.

1 - INTRODUCTION

We have been developing an approach based on a more qualitative study of the sound environment which will complement in a preparatory fashion the usual metrological surveying techniques used in urban acoustics. It is directly based on the notion of atmosphere (called "ambiance" in French [1]) and the descriptive and interpretative tools, namely, the sound effects [2]. This method was developed in collaboration with Nicolas Boyer. It has been used in an exploratory fashion in several research projects [3], [4] with the interdisciplinary collaboration of other laboratories, such as the CERMA and the LCPC in Nantes, or the LAUM in Mans. Two sites were used for this study: the Z.A.C. Vigny-Musset in Grenoble (Isère), and the Port au Blé district in Rezé (Loire-Atlantique).

2 - METHODOLOGY

Approaching a "sound atmosphere" ("ambiances sonores") involves an interdisciplinary process taking into account both the physical and the constructed dimensions of the space, as well as the social and perspective dimensions given to it by the users. We will thus make the triple postulate of an approach which will be: urban, in situ and dynamic. Our commented-listening (écoute qualifiée) method stems directly from the method of the commented circuits [5]. The next step after an architectural and urban survey is to obtain the reports of what is perceived whilst moving thanks to a recording device and an acoustic amplification.

The *listening subject* is fitted out with two systems of synchronised recording equipment:

1. The amplified listening apparatus: a directional microphone + a pole that the listener directs himself + D.A.T. recording of the sound environment + headphones (the band is adjusted to dB(A) level to enable a later metrological analysis).
2. Comments: a small lapel mounted microphone + Dictaphone recording of the descriptions.



Figure 1: Walking, listening and describing.

This technical apparatus, thanks to the emphasis it lays on the surrounding sounds, helps the participant speak of what is usually taken for granted and is thus difficult to express, namely our usual sound environment. A researcher accompanies the participant to guide him and to encourage him to speak when necessary. His presence is also necessary to put the comments into context and note their relative importance. The participants are mainly selected on the basis of their connections – or lack of them – to the studied space: lodgings, work, shops, school, walks, gardens... They went round the circuits at different times of the day and on different days, and even in different weather conditions. From fifteen candidates onwards, it was soon clear from the amount of repetition within the comments, that it was possible to circumscribe the different phenomenon

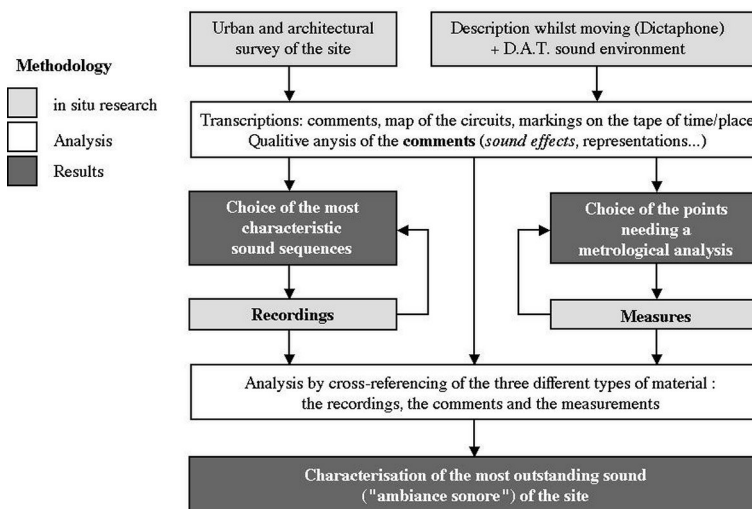


Figure 2: General methodology.

3 - ANALYSIS

The qualitative analysis of the participant's comments in response to the built environment is done following a technique called "table and scissors" (la table et les ciseaux) (a phrase coined by Y. Chalas [6]). This technique is often used for the construction of typologies, and in figurative analysis (analyse figurative). The sequencing into meaningful entities is done following five modes of apprehending sounds. The first three correspond to three of the four ways of listening listed by Pierre Schaeffer [7] namely: **perception** (unprocessed sounds, "ouïr"), **hearing** (qualitative perception or perceptions qualifiées, "entendre") and **listening** (indications, "écouter"). The analysis of the comments implies the adjunction of two more criteria: the sounds directly linked to the participants and the statements which qualify the sound space in a more general way. This second stage enables us to list the qualities and the sound phenomenon according to the different spaces and transitions studied. This enables us to select what is major and sufficiently recurrent within the sound environment to record and measure the characteristics of these phenomenon in a third stage. Finally, an analysis combining these three types of data (comments, recordings and measurements) enables us to specify what the more noteworthy sound atmospheres of the site.

4 - EXAMPLE

To illustrate this method, here is a simplified example of two "mask" effects on a short sequence taken from the Nantes study (Rezé). The participant walks along a two lane road lined with low buildings, skirts a rather busy roundabout, walks away from it, then along a pavement, to finally enter an open-space where there is a tram stop.



Figure 3: [Bus + Tram: levels dB(A)] two "mask" effects/ two different perceptions.

Recording (D.A.T.)	Interesting expressions (extracts) (Dictaphone)	Description of the sound effect	Temporality Sequence	Indicative measurements	Synthesis, Comments
...					
Flow of cars	<ul style="list-style-type: none"> • "... In fact, the cars make such a noise that any other sound is drowned out. I can see the tram, but I can't even hear it." • "a moped, but I did not really hear it. One can't hear any birds at all." • "And so this is... well there I could not say a thing, it was impossible to hear anything." 	"Mask" Continuum	Continuous	$L_{eq(10\ s)} = 63$ dB(A) (during traffic)	The participants even stop talking (the cars drown their voices) and wait until the noise has died down or until they have walked further. In general people walk faster went skirting the roundabout.
...					
The tram goes by (It's arrival, bell rings, it brakes, the doors open, passengers get on and off, the doors close, it drives away)	<ul style="list-style-type: none"> • "I can hear... yes,... faintly hear the tram." • "Now I can hear the tram going by." • "The tram is pulling away, my ears are ringing slightly." • "The tram bells" • "Whirrrrrrr, it is pulling away, I can hear it clearly" • "And here comes a tram... now... it is slowing down...whizzzz... now, it is whistling again. It's stopping." 	Emergence Crescendo Signal "Mask"	Narrative Series of events	$L_{eq(10\ s)} = 75$ dB(A) (when the tram comes) $L_{max} = 84$ dB(A)	People note the tram's arrival far more than its departure. Narrative sequence.
...					

Table 1: Cross-referencing of different types of material (extract).

There are two occurrences of the "mask" effect within this short walk linked to the passage of cars. The first one is generated by the traffic at the roundabout. It is characterised by several factors. First of all, people express it in a direct manner: "the cars make such a noise any other sound is drowned out". Secondly, they also express it in a more indirect way, through its impregnation on the general context: "I can see the tram but I can't even hear it". Thirdly, it is noticeable when listening to the comments themselves that the subjects stop talking and only resume their commentary once they have

left the roundabout. Fourthly it is recorded and fifthly it is characterised by a measurement. This effect is generally perceived as being a nuisance, people walk faster when they go past and this negative connotation is found in the different comments, going as far even as the obliteration of all identity: *"it is impossible to hear anything"*, when in fact one can clearly hear it.

On the contrary, the "mask" effect created by the tram's arrival is never perceived as a nuisance whereas the noise level is clearly more important. The sound characteristics of the tramway and its use have the dual characteristic of forming a series of events limited in time (whereas car traffic partakes of a continuum) and part of a narrative (the series of events forming a meaningful sequence).

5 - CONCLUSION

The localisation and the characterisation of the meaningful sound phenomenon render a metrological economy possible, whilst answering the classical questions on the acoustic evaluation of a large urban zone: what should one measure, where, when, and using what types of measures and analysis? This complementary approach to the more classical techniques enable us to widen the field of the observable in acoustic metrology thanks to an interdisciplinary combination of the sound phenomenon (characterisation of the built surroundings, of the activities, urban perceptions, measures and temporality ...) Furthermore, the measures and recordings only grasp certain dimensions of the perceived sound environment. Taking the circuit as a basis, the urban speech and way of listening introduce fundamental parameters to the qualification of atmosphere, namely **the time dynamics and the interaction of the city dwellers to their surroundings**.

Translator's note: "qualified listening" includes the idea of quality and of qualifying, describing.

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