An activity-centric conceptual framework for assessing and creating positive urban soundscapes

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AN ACTIVITY-CENTRIC CONCEPTUAL FRAMEWORK FOR ASSESSING AND CREATING POSITIVE URBAN SOUNDSCAPES

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1 INTRODUCTION

The Positive Soundscapes Project is an interdisciplinary investigation of soundscape perception [1]. The project seeks to develop a rounded view of human perception of soundscapes by drawing together methods from the disciplines of engineering sound quality [2], acoustics, psychoacoustics, physiology [3], as well as sound art, acoustic ecology and social science [4]. In the acoustics community, sound in the environment, especially that made by other people has overwhelmingly been considered in negative terms as both intrusive and undesirable. The strong focus of traditional engineering acoustics on reducing noise levels ignores the many possibilities for characterizing positive aspects of the soundscape, whereas art and social science disciplines interpret soundscape perception as a multimodal and multi-dimensional concept. The project team come from a wide range of disciplines and are applying their experiences to investigate soundscapes from different aspects to produce a more nuanced and complete picture of listener response than has so far been achieved.

In order for the team behind the project to achieve this, an underpinning framework is required, by which to approach and move the project forward, while aligning thinking from the different disciplines. This paper describes a high-level first iteration of the conceptual framework, which is structured in three parts. The use and potential application of the framework within the Positive Soundscapes Project is then discussed.

2 THE CONCEPTUAL FRAMEWORK

2.1 Part 1: Sounds and the “sound-scape”

The soundscape cannot be described by metrics alone. Psychoacoustic metrics such as loudness, roughness, articulation index etc, while useful for describing the sound signal, cannot describe the soundscape in full, in a format that is useful for planners. The soundscape is made up of multiple sound sources and the relationships between those sound sources. Figure 1 presents this concept visually, where “Sound” represents psychoacoustic metrics (such as loudness, sharpness etc) and “Scape” represents the concept that a soundscape is a dynamically changing entity, made up of various sound sources and the relationships between these sources. There could be any number of ways of describing the dimensions that make up the “scape” (some possibilities are shown in Figure 1, though it should be noted that these are illustrative and not exhaustive), and it is the challenge for the Positive Soundscapes Project is to understand these, and in particular, what it is about these that is considered *positive*.

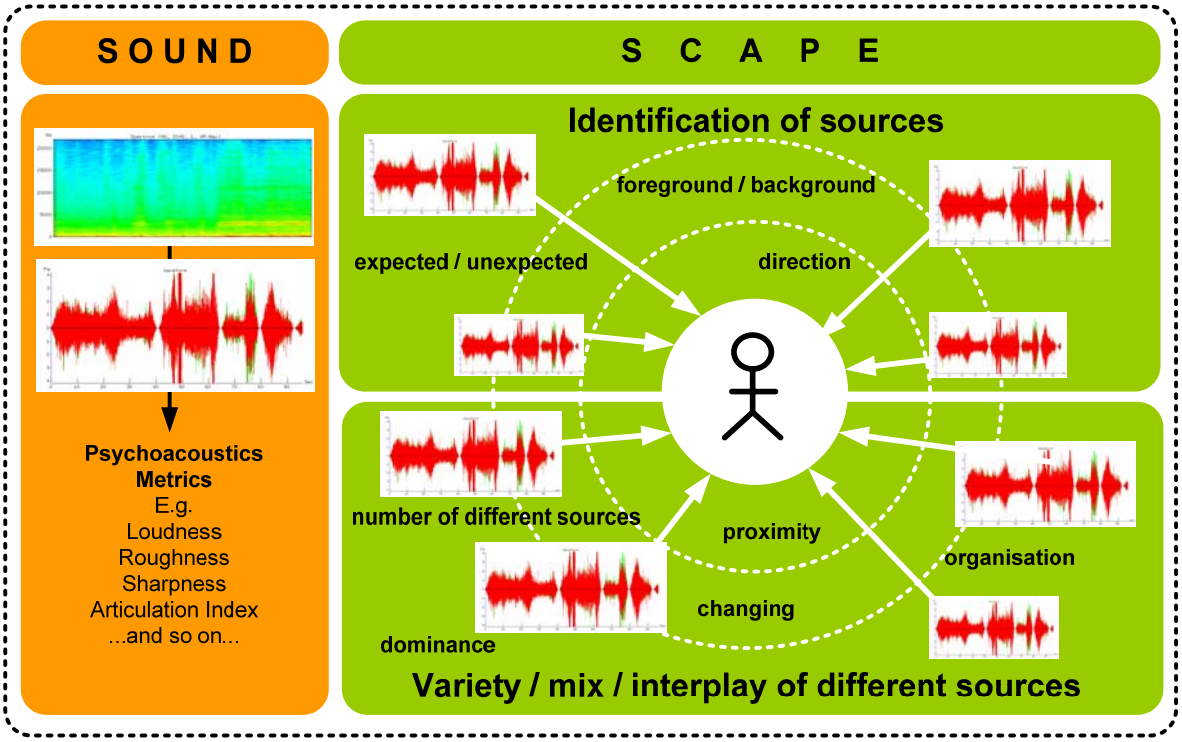

Figure 1: Framework Part 1 - Sound-Scape

2.2 What is positive sound?

While it is generally acknowledged that certain sounds such as birdsong and water are generally perceived to be pleasant, whereas traffic noise is generally perceived to be negative, is it the case that the sound of water is always relaxing? Or can it become annoying if it is so loud that it intrudes on a conversation or mobile phone call? Are the sounds of street buskers annoying when traveling to work but quite enjoyable at other times, or vice versa? It is clear that the perception of a soundscape is inherently personal and affected by what people - as individuals with their own experiences and preferences, bring to the listening situation.

This presents a significant challenge in the exploration of positive soundscapes. Based on contextual issues, we think that finding the answer to what is positive sound, starts by adopting an activity-centric standpoint – i.e. working on the premise that perception of the soundscape depends upon:

- who you are (demographics)
- why and how you are listening (activity at the time of listening and listening state),
- the time of day you are listening (temporal factors),
- the location and the type of space you are in (spatial factors)

2.3 Part 2: Activity

Our framework is based upon the notion that (Figure2):

Figure 2: Framework Part 2 - Basis for the activity-centric framework

All these things affect the perception of a soundscape. In more detail, this translates into the following factors (Figure 3):

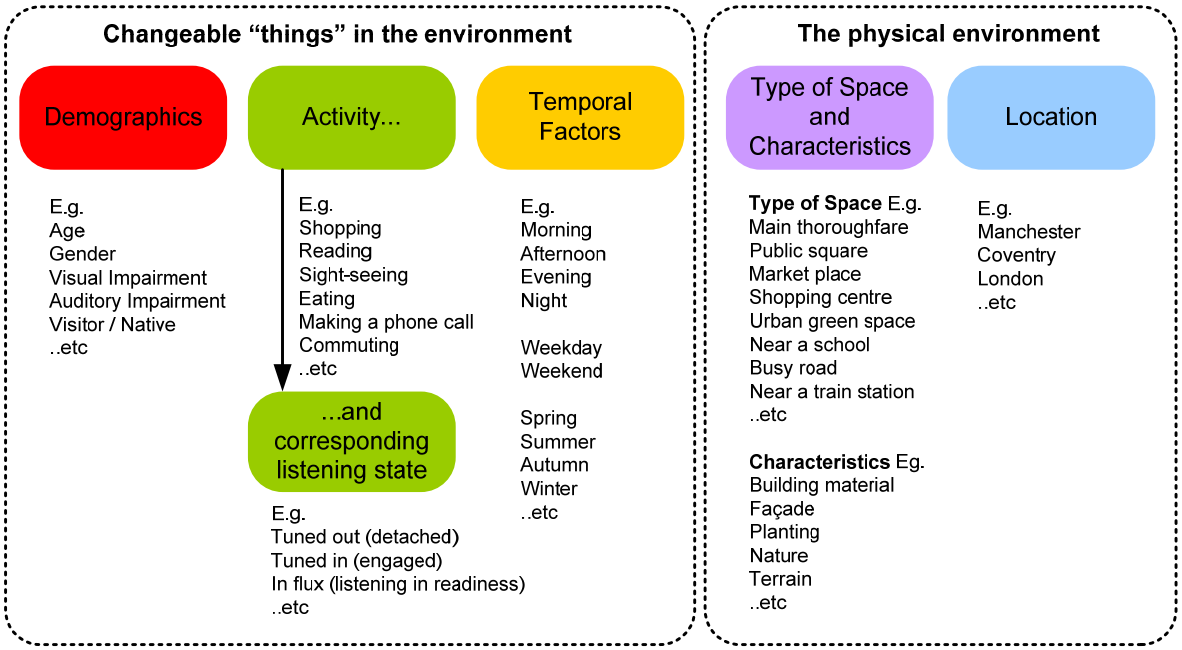

Figure 3: Framework Part 2 - The expanded activity-centric framework

These factors all affect the perception of soundscapes, but interestingly, none of them are about the sound itself. Presenting them in this way allows us to clearly identify and understand all the influencers on soundscape perception. The listener demographic can affect the perception of a soundscape according to objective factors including: age; gender; and impairment (visual or hearing). Furthermore, the status of a listener as a visitor or a resident (a native) could also have an affect as a person's priorities and responses may be different according to this status. In addition to the objective demographic indicators, people also bring their own cognitions to the listening situation. These cognitions can represent memories, ideas, feelings, attitudes, values, preferences, meanings and conceptions of behaviour and experience which relate to the variety and complexity of physical settings (Proshansky et al 1983).

The framework is underpinned by the idea that a person's perception of a soundscape depends on the activity they are doing at the time, and consequently their corresponding state of listening. Truax (1984) has defined three states of listening:

- **Listening in search**, or analytical listening is an active, conscious activity where the listener is "tuned in" to whatever they are listening to. E.g. Concentrating on listening to the sounds of traffic.

- **Listening in readiness** is an intermediate type of listening where the listener's attention is ready to receive significant information but where the focus of attention is directed elsewhere. E.g. Hearing and recognising your phone ring, when others' phones are ringing around you.
- **Background listening**, or distracted listening is where the listener is engaged in another activity, "tuning out" the sound. E.g. concentrating on reading a book or holding a conversation.

These listening states can be mapped onto the various activities that can take place in urban spaces. This has particular relevance for the lab-based soundscape evaluations to be conducted within the Positive Soundscapes Project, where it is important to simulate realistic contextual conditions in order to produce meaningful results. The challenge however, is how to simulate such listening states under laboratory conditions, and this is a strand of current enquiry within the project, drawing together expertise from Psychology and Engineering.

It is also important to consider the effect of temporal conditions, as perception of a soundscape may change over the course of a day, or over the course of a week or a year. Weekdays and weekends may produce very different soundscapes in the same space. Furthermore, seasonal differences, and consequently changes in the weather may also have a significant impact. The purpose of a specific type of space, i.e. whether it is a public square, thoroughfare, busy road, undercover shopping area etc. will also obviously affect the soundscape, as will its morphology and the built landscape, so it is important to take all of these factors into account.

3 APPLICATION OF THE FRAMEWORK

This framework has provided a useful platform for bringing together the different disciplines within the Positive Soundscapes Project. In an attempt to address the problem from a more coherent interdisciplinary approach, team members from the disciplines of engineering, social sciences and art are in the process of collecting soundscape data for use in the project. Three case study locations have been selected: Manchester; Coventry and London (to give a geographical spread, and for proximity to the participating institutions) and specific spaces within these cities have been identified (e.g. public squares; urban green spaces; busy streets – pedestrianised, and with traffic) as well as a route which takes in these spaces and the linkages between them. Engineering is collecting recordings for use in laboratory evaluations; art is collecting recordings for use in an artistic sonic sound sequencer "toy" which also be used to collect data from the public; and social sciences is collecting qualitative data from planners and architects through interviews and soundwalks. All the recording locations and soundwalks are being documented through photography and detailed observations of the architectural characteristics. As activity and listening state is the underpinning concept, the activities and usage occurring in each location, and demographic observations are also documented.

3.1 Part 3: Mapping positive sounds with usage

Using this information, a possible way to approach the definition of positive soundscapes, is to identify which demographic groups use a particular space; to identify what activities occur there and consequently the listening states of the users, and work out the proportions of usage for that space. From here, definitions of *positive* soundscapes (as determined through laboratory studies and field-based qualitative research) based on demographic and listening state preferences can be offered (Figure 4). Planners may be able to use this information to help assess whether their space will give a positive perception of sound – providing they know who uses the spaces and the types of activities that occur (or they want to occur) in particular spaces. This concept of usage and people as an approach to defining "positiveness" is currently being explored within the project. This approach however, does have its limitations, as on a pragmatic level it is difficult to accurately determine which demographic groups use particular spaces, and the demographics of users can

change over time (throughout the day, or over weeks, months or years). However, observations of activity are more straightforward to collect, and can provide the linkage to listening state. Underpinning this of course, needs to be an understanding of which activities are linked to the different listening states, and this is a current line of enquiry within the project (as mentioned in Section 2.3)

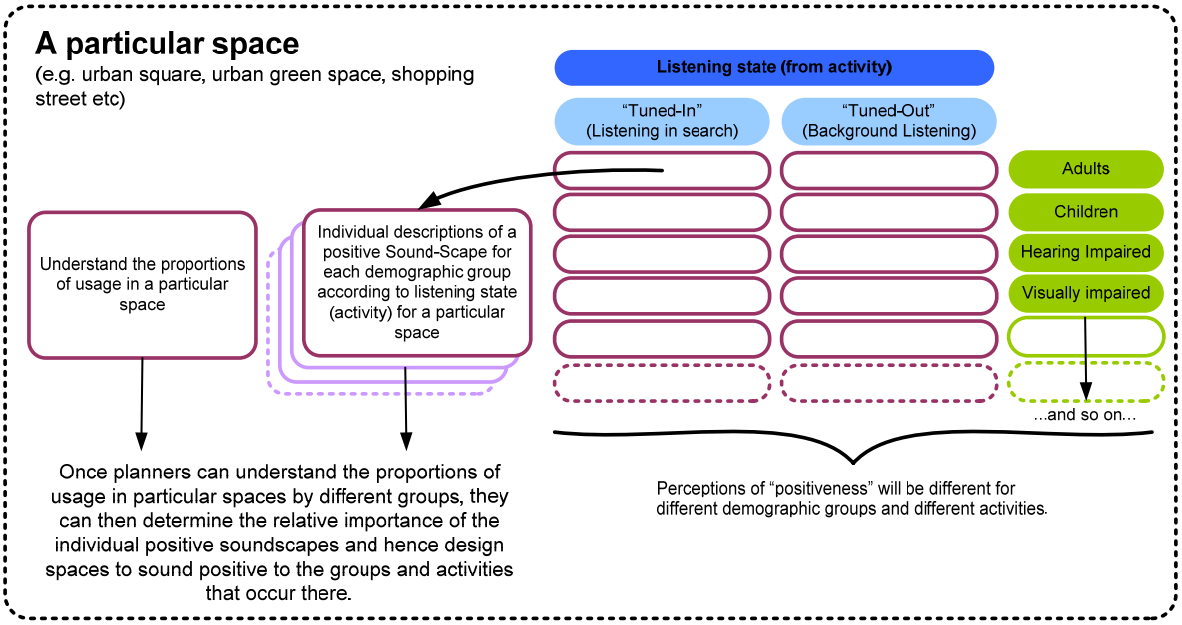

Figure 4: Framework Part 3 - Mapping usage (listening states and demographics) to a space

4 SUMMARY

This paper has presented a working activity-centric conceptual framework that is under development within the Postive Soundscapes Project. The framework takes into account the dimensions of activity, time and space and considers the relationship between sound engineering data and the interplay of multiple sound sources in creating a positive soundscape. The framework perhaps poses more questions than it answers at this point, and raises the issue of considering contextual issues, (in particular listening states and demographic factors) in the definition of positive soundscapes. The framework presented here is a high-level first iteration, and the intention is for it to evolve as the methodologies from the different disciplines come together to present a more complete understanding of positive soundscapes.

Acknowledgements
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