Chapter 17
Graphical Research Tools for Acoustic Design Training: Capturing Perception in Architectural Settings

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ABSTRACT
This chapter presents an overview of 3 graphical tools supporting soundscape assessment in different settings, indoors and outdoors. These research prototypes support the spatial organization of the perceptual information available to the participants and are designed based on surveying techniques used in architectural training to create a foundation for acoustic design education in architecture schools. This chapter reports the contexts of the focus groups investigations, presenting advantages and drawbacks related to their use. It has been found that participants often added explanatory verbal data and arrows to the provided diagrams. The diagrams and their use have been interpreted with the support of the qualitative data captured along the studies through thematic analysis. Finally, paper prototypes are useful for educational approaches, but future more comprehensive studies will require integrating these tools in existing or yet-to-be-designed systematic frameworks for soundscape analysis and design.

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INTRODUCTION

Soundscape research aims to raise awareness of the sonic environment using approaches including soundwalks, interviews, listening tests, and objective measurements (Aletta, Kang & Axelsson, 2016). A common objective in this research field of research is to bridge the gap between the design of the built environment and best-practices or regulations in environmental noise assessment. Soundscape research also examines how the concept of acoustic comfort is understood by people in different situations. This requires a careful examination of the factors that might influence users’ judgement of a given space, including the space’s function and the users’ activity. In the past decades, researchers in Environmental Psychology have also contributed to this research field through attention to acoustic comfort, together with visual, thermal, and hygrometric factors. This multidisciplinary research field investigates both the system of factors affecting human behavior and perception of environments, and aims to improve the environmental comfort of inhabited spaces. In doing so soundscape research aims to influence the work of design professionals.

Within this context, we are concerned with the extent to which a graphical research tool can support perceptual studies focused on acoustic design training, during in situ soundscape assessment. We investigate how participants described, graphically or with text, the present soundscape. A methodology is provided to analyse the qualitative data collected during interviews and soundwalks, and design guidelines are suggested for those who wish to conduct soundscape research with similar approaches.

BACKGROUND

Dependency of Soundscape Assessment From User Activities

It is good practice to design architectural spaces to maximize user comfort during activities expected to take place there. This general attention is supported by guidelines on “well-designed places” (UK GOV, 2014), or studies stressing out the impact on places on health (Frumkin, 2003). The interaction with natural environments can improve cognitive functioning (Berman, Jonides, and Kaplan, 2008), and the physiological role of soundscapes on this restorative potential (Medvedev, Sheperd, & Hautus, 2015) recently started being explored.

When inhabiting spaces, humans do not always intentionally listen to the entirety of the surrounding soundscape, for example filtering out some sounds to focus attention on specific tasks (Ghozi et al., 2015). Foale (2014) researched this topic by asking participants to keep a sound diary, creating a summary of their listening activities, according to their everyday schedule.

Attention can be selective and affect the perceived quality of a soundscape. Meng and Kang (2013) found that those waiting for somebody in a shopping mall perceived the environment as louder than those shopping, walking or passing by, and judged their acoustic comfort as lower. They also found a similar influence of human behaviors on the judgement of sound-related outdoor activities (Meng & Kang, 2016).

Hong and Jeon (2015) defined the relative weight of seven factors on the users’ judgements of four different areas (commercial, residential, business, recreational). Judgements depended on the different importance attributed for each case to sound sources (human, natural, traffic), to the harmony of the environment, pleasantness, eventfulness and visual quality.