



HAL
open science

The sonic niche - A new design tool to enhance and create atmospheres with sounds in the contemporary city

Antonella Radicchi

► **To cite this version:**

Antonella Radicchi. The sonic niche - A new design tool to enhance and create atmospheres with sounds in the contemporary city. *Ambiances in action / Ambiances en acte(s) - International Congress on Ambiances*, Montreal 2012, Sep 2012, Montreal, Canada. pp.253-258. halshs-00745534

HAL Id: halshs-00745534

<https://shs.hal.science/halshs-00745534>

Submitted on 25 Oct 2012

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

The sonic niche

A new design tool to enhance and create atmospheres with sounds in the contemporary city

Antonella RADICCHI

TEMPO REALE, Center for Music Production, Research and Education, Italy
antonellaradicchi@gmail.com

Abstract. *The sonic niche is a design tool I first conceived for the project Soundscapes Oltrarno, in its “digital” version, where we can see it realized through the application of “Spot Sounds” and the use of new digital technologies. I subsequently theorized it in my doctoral dissertation as “a relational sonic space of intimacy and sharing whose changing boundaries are defined each time by its own structural and sound qualities” (Radicchi, 2010). The expressive possibilities offered by the sonic niche, in addition to its digital approach, are many. It is possible to change shapes, materials and soundscapes according to the purpose to be achieved and the place of its setting. The paper presents several design projects where the sonic niche was applied to enhance and create urban atmospheres in the city of Florence (IT): Soundscapes Oltrarno, SMLXL, Le Piagge: Listen!*

Keywords: *sensuous urbanism, soundscape, atmosphere, niche, time geography*

Introduction

The *sonic niche* is the design tool that I conceptualized and theorized during my doctoral research that led to the dissertation *On the Sonic Images of the City. Designing Soundscapes in Contemporary Cities*.¹

In detail, the dissertation verifies the potentialities that exist in designing soundscapes within the process of contemporary city renewal and reaches the following objectives:

- promote a new *Sensuous Urbanism* which not only describes the morphology but also the character, the time and the atmospheres of places;
- support the integration of Soundscape Studies within the disciplinary field of Urbanism;
- promote a creative approach to the sonic environment in comparison with the defensive and reparative approach which is adopted when the soundscape is reduced to a mere problem of noise pollution;
- verify how urban morphology acts upon soundscapes;
- encourage eco-sustainable projects according to the European Regulations on noise pollution.

In the first part of the dissertation, I define the disciplinary fields. The research on the image of the city, with a deeper study of Kevin Lynch’s theoretical corpus which was created during the years he spent at MIT, allowed me to identify in the realm of *Sensuous Urbanism* the theoretical frame from which I want to expose the predominance of sight over the other senses; I also emphasize the importance of finding a holistic approach to the discipline of

1. *The dissertation has been awarded of the “2010 INU Award” for the best dissertation in Urbanism and Territorial Planning, and the “2012 Research Award – City of Florence”, for the best dissertations to be published.*

Urbanism, identifying the sonic dimension as one of the possible paths leading to said objective. I then define the second disciplinary field, that of Soundscape Studies, through a brief synthesis of the evolution of the concept of *soundscape* throughout the twentieth century, and analyzing the state of the art of theoretical researches – both completed and underway – which are considered more meaningful.

In the second part, I explore both soundscapes mapping and design tools within the disciplinary fields mentioned above. I verify the possibilities of representing and mapping soundscapes, and I show the limits of the quantitative approach, typical of the current Italian legislation and employed in traditional Italian acoustic planning. I demonstrate the need to adopt a qualitative approach to the sonic environment, identifying in soundmaps a valuable operational tool to be integrated in the urban planner's toolbox. I then describe the *tender sound map* of Florence²: an example of soundmap for the city of Florence, which I conceived and developed from scratch, where the sonic environment is interpreted from an emotional standpoint. Finally, I suggest some methodology for soundscapes design proposing a review of "best case studies" from the disciplinary fields of history of architecture, urbanism, landscape architecture and dance theatre. The chapter ends with the description of the *sonic niche*: a design tool, which I first conceived (and subsequently theorized) for the project *Soundscapes Oltrarno*³.

In the dissertation conclusion, I offer a methodological direction which encourages an integration of the soundscape studies within the discipline of Urbanism, and I propose the operational tools of the *tender sound map* of Florence and the *sonic niche* as a resource for a design process able to achieve the ideal synthesis in designing physical and acoustic space in contemporary city.

The sonic niche

The expression *sonic niche* means "a relational sonic space of intimacy and sharing whose changing boundaries are defined each time by its own structural and sound qualities" (Radicchi, 2010). In this sense the definition of the word *niche* differs from what commonly identifies a space of isolation, loneliness and immobility (if we think for example of the niches holding statues or those recesses in a rock face used as shelters by mountaineers!);⁴ instead its meaning comes closer to its etymological root of (sea)shell, which evokes the image of something simple but precious at the same time. This relational dimension also implies a relationship with the environments in which a *sonic niche* is placed; the contents of soundscapes are proposed to trigger a series of multi-scalar results with reference to the cultural and identifying elements of the surrounding landscape. The spatial dimensions of the *sonic niche* however, generally contained, help to create a sense of intimacy and induce a real feeling of proximity. The gap between this sense of emotional and physical closeness, and the psychic drifting one experiences by listening to multiple soundscapes within the landscape, results in a reflection on the significance and meaning of concepts of movement and temporality, which are crucial problems in contemporary urban design.

The inspiration behind the theory of the *sonic niche* came from the reading of a consideration which Kevin Lynch made about Florence during his stay in the city: "Something... is

2. www.firenzesoundmap.org

3. A project developed during the M.I.T. Workshop Digital City Design (Fall 2007) by Antonella Radicchi, Ph.D. visiting student, and Francisca Rojas, Ph.D. student, at the City Design and Development Lab (CDD), School of Architecture and Planning (SA+P), M.I.T. See: (Radicchi & Rojas, 2009).

4. Niche: "a recess in a wall, usually in the form of vertical half-cylinder topped by a quarter of sphere: decorative element, mostly intended to be filled with a statue, expanding from its primary sense: a small closet, or stable accommodation, convenient, undisturbed, in the jargon of the mountaineers, a small hollow in a rock face, sufficient to shelter one person, in ecology, a place featuring the environmental factors favorable to a species. [...]" (Devoto Oli, 1992) – (translation by the author).

needed in cities: an over-all-order which mutes the complexity, but with many nooks which people can choose as their own and embellish themselves” (Lynch 1953). Then, it was first illustrated, in its “digital” version, in the project *Soundscapes Oltrarno*, where we can see it realized through the application of “Spot Sounds” and the use of new digital technologies. The expressive possibilities offered by the *sonic niche*, in addition to its digital approach, are many. It is possible to change shapes, materials and soundscapes according to the purpose to be achieved and the place of its setting. A project regarding the morphology of the *sonic niche* will of course include a formal choice made in close connection with the sound effect to be achieved: in fact sinusoidal shapes favour the diffusion of sound (as in the magnificent coverage of the conference hall of Viipuri Library by Alvar Aalto) whereas convex surfaces enhance its focus. Also the selection of materials is of great importance in determining the spatial sound effects, not only for the particular deadening or reflectance characteristics certain materials have as to others. The use of wood, for example, is very effective in creating analog soundscapes because it has a large number of sound characteristics such as axial direction, perimeter directional characteristic, rhythmicity, tonality, quality of the marimba, focus, diffusion and informativity, which allow a wide range of very interesting sounds. Lastly the new digital technologies, we see applied in the projects *Soundscapes Oltrarno and XSML*, will greatly contribute to the expansion of the expressive possibilities featured by the *sonic niche*, especially in the creation of artificial soundscapes.

Case studies

Soundscapes Oltrarno

Soundscapes Oltrarno addresses the auditory nature of urban experience. Oltrarno is a diverse neighborhood of social and economic activity including craft workshops, universities, restaurants, churches, and piazzas. These activities produce unique sounds, but this sonic richness is obscured by noise pollution created by automobile traffic. Before the motorcar, the auditory patterns of the city were distinct from place to place, and we can surmise this from 19th century literature where, for example, the sound of a child singing on an Oltrarno street sets the scene for Elizabeth Barrett Brownings 1851 poem *Casa Guidi Windows*: “I hear last night / a little child go singing / neath casa Guidi / windows, by the church / “O bella libertà, o bella...” (Brownings, 1851)

But during the last century, neighborhoods like Oltrarno – and in cities elsewhere – have lost their “sound identities” because cars, motor scooters, and buses create an ambient level of noise that muffles individual sounds. In the future, the act of replacing noisy, gas-fueled vehicles with quiet CityCars and scooters will allow Oltrarno to recapture its sound identity. The question is, what sounds will substitute for the motors and horns? According to philosopher Peter Sloterdijk, people dwell in bells of sounds and, due to these “spheres” they have the ability to distinguish between the group to which they belong and their direct surroundings. Sloterdijk sees sound as an effective way of creating space (de Jong & Schuilenburg, 2008). As such, *Soundscapes Oltrarno* aims to facilitate the creation of spaces through digital technologies that can counteract the steady drone or deafening roar of automobile traffic. The audio-based intervention investigated in this study aims not only to address the traffic noise that obscures the sound identities of places in Oltrarno but also looks to engage the burgeoning youth culture in the neighborhood. *Soundscapes Oltrarno* also uses sound to activate, bring content, or call attention to the small spaces, or “nooks” throughout the neighborhood that are often overlooked. *Soundscapes Oltrarno* will re-expose the sound identities of places using digital sound interventions in strategic areas of Oltrarno. By harnessing digital technologies such as Audio spotlights⁵, digital music players,

5. www.holosonics.com

mobile phones, and multi-track recording software – both in the city and on the Internet – *Soundscapes Oltrarno* establishes an “open source” process by which neighborhood residents and visitors can create, capture, manipulate and expose sounds and music in the public spaces of the city.

We propose three approaches to creating a layered soundscape in the neighborhood:

1. *Translate* physical qualities of built form and the activities of people in public spaces using ambient and interactive sound;
2. *Reveal* the narratives associated with everyday places through open source audio content;
3. *Transpose* hidden soundscapes, such as those found in the enclosed gardens of the neighborhood, to individuals in places overwhelmed by traffic noise.

The insertion of sounds in the public realm will also serve as what William H. Whyte calls triangulation: “...the process by which some external stimulus provides a linkage between people and prompts strangers to talk to each other” (White, 1988). *Soundscapes Oltrarno* has the potential to create interaction between people, be they residents or tourists, young or old, and the soundscapes will particularly engage young people in revealing the variety that exists within the sonic landscape of Oltrarno.

The second approach *Reveal* uses to “Spot Sounds” to insert audio narratives into the nooks of Oltrarno, and to transform them in *sonic niches*. This invites residents of Oltrarno to capture or produce narratives relevant to the forgotten corners of their neighborhood: the content could be anything that can be communicated aurally, a piece of music associated with a place, an amusing anecdote about a memorable event, a series of abstract sounds to conjure particular emotions. Spot Sounds are activated by three elements:

- RFID tags carried by people, which identify their tastes and interests;
- sensors that pick up the presence of an RFID tag;
- audio spotlights that emit the kind of audio narrative that the person standing in that place wants to hear.

Finally, audio spotlights direct sound so that people nearby cannot hear it, and thus realize the bell of sound, that creates a space different from the one before us and that define a space of the “digital” *sonic niche*.

XSML⁶

XSML aims to requalify the Santa Croce neighborhood of Florence through planning and design actions based on a multi-sensory approach that includes the implementation of XSML sound installations that work with the specific sound atmospheres of a place.

Santa Croce is located in the historic center of Florence and is characterized by its cultural liveliness and vibrant social activity thanks to the presence of the Faculty of Architecture and the picturesque Sant'Ambrogio Market. Every morning, in the area occupying Piazza Ghiberti, the market hosts a variety of food and clothing merchants. Adjacent to the piazza, in an 1873 building designed by Giuseppe Mengoni, the covered space is home to food stands and eateries. In front of the market, along via della Mattonaia, lies the former Santa Verdiana Monastery, which, once used as a women's prison, is the current Faculty of Architecture. Additionally, in this neighborhood, one can find one of the most beautiful squares and churches in Florence, the Santa Croce Basilica, which acts as an important place of worship and encounter, so much that it is known as the node of Florentine life.

6. The project was realized together with the following students: Sondra Pantani, Giulia Pollerone, Ilaria Stefani Donati, during the course *Disegnare paesaggio attraverso i sensi (Designing Landscapes with the Senses)* which I offered during the 2010/2011 academic year at the Faculty of Architecture in Florence.

From a methodological point of view, the area was analysed by applying an experiential and multi-sensory approach to place and to its residents, accompanied by traditional historical and morphological analyses.

The analyses were collected and later organized into four main groups:

1. *Historical Places*: Sant'Ambrogio Market, the Loggia del Pesce, Santa Croce Basilica and square, the National Library;
2. *Potential Places*: places that, due to their function or position, can gain greater meaning. These places are: the university institution, streets that connect points of aggregation, public gardens, historic elements, the theatre, historic spaces, characteristic paths;
3. *Critical Places*: places to be restored through careful intervention, such as bike parking, refuse collection points, uneven street paving;
4. *Social Gathering Places*: places for meeting and cultural exchange such as the university, the public squares, intersections, streets connections points of interest, the historical market, nightlife venues.

Based on these four main groups a masterplan of the area was prepared and designs were developed that provided for the inclusion of sound installations XSML in areas showing that people constantly pause or stop, but never consciously listen to the surrounding soundscape. The installation consists of four *sonic niches* of different sizes: X, S, M, L, which work simultaneously on four different scales of the soundscape. The niches are home to a seat, a pair of headphones for listening, and an interactive touch screen that allows the user to actively participate by inserting comments, suggestions, or curiosities. The installation XSML offers the experience of a virtual journey by profoundly listening to the soundscapes offered.

The X niche represents the proxemic sound of the place in which it is placed. Through the use of the touch screen and connected headphones, one has the option to consciously listen to characteristic and identifiable sounds of the place in which the niche is found, where, probably out of habit or disregard, had never paid any previous attention.

The S niche refers to the sound space of the neighborhood, allowing one to discover the sounds of the particular zone; sounds that one can imagine but for their different locations cannot listen to directly.

The M niche represents the sound space of the entire city; it is Florence talking! Using the *tender soundmap* of the city one can choose to listen to different points of the city, immersing oneself into new soundscapes.

The L niche, then, represents sound space of the world. Thanks to the technologies offered by the Internet, the user can “hear” sound compositions created and disseminated by different Internet users, as well as connect to the sound maps of cities around the world.

*Le Piagge: Listen!*⁷

The project focuses on concept of the sounds and their space-time context, searching to compose the subject areas of Soundscape Studies and Time Geography, with the intention of completing the mechanical basis on which the analysis of soundscape is commonly founded (Mayr, 2004). The project looks at the Le Piagge neighborhood, an urbanized area on the outskirts of Florence. In particular, the study focuses on the area starting from Piazza I Maggio, crossing via della Corte dei Manetti, via Pistoiese and the green space between via Marche and via Liguria, and continuing until the bank of the Arno River where parking for the Cascine-Renai Linear Park is located. Choosing a site in the periphery, far from the delicacies of historic buildings in the urban center, provides for the possibility of larger interventions and allows the project of the soundscape to act on the morphological and material

7. The project is still in progress. It was conceived of and developed by the author together with the composer Albert Mayr.

aspects of the place. The methodology chosen for the case study's analysis phase combines an experimental approach to socio-acoustic – which led to the realization of a series of interviews with a sampling of local residents⁸ – along with Time Geography analysis, borrowed from the School of Lund (Thrift, 1977). The data collected during the interviews were included in the tender soundmap of Florence and allowed for the making of sound biographies (Mayr, 2004). The design methodology includes the implementation of the following interventions along the route identified in the analysis phase: modeling the morphology of open spaces and a careful choice of materials, enhancing the resonance of the place, and including sound niches, together creating new sound atmospheres.

Acknowledgments

Francisca Rojas, Sondra Pantani, Giulia Pollerone and Ilaria Stefani Donati, Albert Mayr, and the residents of Piagge who were so kindly accepting to interviews.

References

- Brownings E. (1851), *Casa Guidi windows. A poem*, London, Chapman & Hall
- de Jong A., Schuilenburg A. (eds) (2006), *Mediapolis*, Rotterdam, 010 Publisher, p. 76
- Devoto G. & Oli G. (1992), *Nuovo vocabolario illustrato della lingua italiana*, Milano, Le Monnier
- Lynch K. (1953), *The Travel Journals*, in Banerjee T. & Southworth M. (eds) (1990), *City Sense and City Design*, Cambridge, the MIT Press, pp. 103-134
- Mayr A. (2004), *The soundscape between experimental music and Time Geography*, in Colimberti A. (ed), *Ecologies of music. Essays on the soundscape*, Roma, Donzelli, pp. 159-170
- Radicchi A. & Rojas F. (2009), *Soundscape Oltrarno*, in Frenchman D. & Mitchell W. (eds), *Technology, Livability, and the Historic City. Future of Florence*, Cambridge, The MIT Press, pp. 80-85
- Radicchi A. (2010), *Sull'immagine sonora della città. La creazione di paesaggi sonori nel progetto della città contemporanea*, Ph.D. dissertation, Faculty of Architecture, University of Florence (currently being published by FUP)
- Thrift N. (1977), *An Introduction to Time Geography*, University of East Anglia, Norwich, Geo abstracts
- White W. H. (1988), *City: Rediscovering the Center*, New York, Doubleday, p. 154

Author

Antonella Radicchi is an architect and researcher in Urban Design. She is the editor of the Tender Soundmap of Florence. Antonella undertook doctoral research both at the SA+P, MIT (USA) and at the Faculty of Architecture, Florence (IT). Antonella has taught and lectured both in Italy and abroad, and collaborates in research projects with Tempo Reale. Her recent projects focus on soundscapes in the contemporary city, and combine the design of both physical and sonic urban spaces. Antonella Radicchi, PhD, RA.
antonellaradicchi@gmail.com

8. The questions focus on three main themes: Permanence and Preference, Time, and Soundscape.