

Urban Reverberation: Juxtapositions Between Sound and Space

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Abstract

This paper aims to discuss sound and space conversational relationship, combining theoretical research and the practice “Urban Reverberation”, a sound intervention held in public space. First, the paper introduces the context of the intervention briefly and after presents its theoretical framework concerning space, interfaces and sound interventions. Then, the article presents the sound intervention discussing its concepts, methods, the interface role and the reactions and comments of the audience, gathered by video recording, photos, and semi-structured interviews. At last, the paper presents its findings and theoretical reflection about the sound intervention.

Keywords: public space, sound interfaces, hybrid environments, sound intervention

1. Introduction

Sound and space interplay goes beyond acoustical features. From certain subjective, the sound environment is ubiquitous: sounds never cease to hearing and is impossible to deprive listening completely as it is possible to close the eyes to not see. Sounds, as a result of physical vibrations, reflect our own actions, movements, habits, and ways of living.

In this paper, we do not consider space as a delimiter package or a container of physical objects; space owns reflexive and heterogeneous character and is formed by social and cultural dynamics and also physical instances. The sound environment is part of it, formed by a set of different sounds and it is influenced by the physical space through acoustics and also modifies the apprehension of space. Thus, sound environment is an element of space and both have an intrinsic relationship, which can be more complex by the use of sound interfaces.

This article discusses the juxtaposition between physical spaces and sound environments through the use of sound interfaces in public spaces. In order to discuss these theoretical matters, the article includes practical contribution: a sound intervention accomplished by Nomads.usp (Centre of Interactive Living Studies, University of São Paulo, Brazil), named Urban Reverberation, held in a public square at São Carlos, São Paulo State, Brazil. The intervention was accomplished as part of an experiment of a broader research which discusses the juxtaposition of sound and physical environments by the use of sound interfaces and collective listening in public spaces.

“Urban Reverberation” consists in the relocation of train’s sounds, recorded in a peripheral neighborhood, into a square located at the commerce centre of São Carlos, São Paulo State, Brazil. The train is part of historical and current context in this city and nowadays the railroad is only used for cargo. The railroad had a great role on the city development in the first half of 20th century but until today the railroad crosses the city and is present in the daily life of several people who lives nearby, imposing its rhythm in several passages. Therefore, due its meaning to several city inhabitants, the train’s sounds had its meanings altered by the exchange of context as well as the apprehension of the public square itself through the intervention.

As a part of an experiment of a research, “Urban Reverberation” addresses three constituents: the Waldomiro Lobbe Sobrinho social housing complex, informally called as CDHU by city dwellers; the Municipal Market Square and, finally, the railroad which crosses the city.

2. Theoretical framework: elaborating hybrid environments

2.1. Space and sound: conversational relationship

Kevin Lynch (1980, p.11) starts his book arguing that moving elements, people and their activities are so important as the physical elements of the city: not only physical features of the city are relevant. Following and expanding this argument, space can be not only considered as formed by its physical objects but also all its actions that occur in it and determine it. Thus, in this paper is argued that space is formed as much by physical bodies as well as by dynamics specific to it; not only by its inert matter, but also by elements which give life to it.

Physical settings make possible or delimit certain actions in space, however two physical spaces with the same characteristics can have completely different uses by distinct communities. In this way, the idea of Milton Santos (2011) is reassured: the space is formed by the relation of set of fixed and fluxes. In other words, space is the relation between the system of objects and the systems of actions; the interaction of physical instances, movements, and dynamics. Thereby it is an interdependent process in which one changes the other. Actions and objects interact inseparably leading to dynamicity of processes and situations (Santos 2001, p.61). As Milton Santos argues:

Systems of Objects and systems of Actions interact. On the one hand, systems of objects condition how the actions occur; on the other hand, the system of actions leads to the creation of new objects or held on pre-existing objects. This is how space has its dynamics and changes. So, from this perspective, space is not limited only by its character determined by physical instances, even though such instances may own different categories. The actions are of people themselves and are results of natural needs or created in diverse scopes: materials, immaterial, economics, social, cultural, moral, affective. (Santos 2001, p.82)¹

1. Translated by the authors. "Sistemas de objetos e sistemas de ações interagem. De um lado, os sistemas de objetos condicionam a forma como se dão as ações e, de outro lado, o sistema de ações leva à criação de objetos novos ou se realiza sobre objetos preexistentes. É assim que o espaço encontra sua dinâmica e se transforma. Tem-se a partir dessa perspectiva de que o espaço, portanto, não está somente limitado ao seu caráter determinado por instâncias físicas, ainda que tais instâncias possam possuir diversas categorias. As ações são próprias das pessoas e são resultantes de necessidades naturais ou criadas de diversos âmbitos: materiais, imateriais, econômicas, sociais, culturais, morais, afetivos."

The variety of human activities depends on contexts from complexes of segregation, social and historical conflicts, to physical space conditions. According to Edward Hall (1977) the use of space is a specialised elaboration of culture: culture is responsible for the use of space and its organization; and the human sense of space is result of various sensorial syntheses. Space is heterogeneous and reflexive; and sound play a role in the apprehension of space.

Due to these discussed aspects sound is considered a conversational element of space: it is 'shaped' by acoustical phenomena as well as it is produced by several actions and dynamics that occurs and forms space. It is a mutual and interdependent interaction, one affects the other. The apprehension and interpretation of space can change according to the result of this interaction. Listening can be considered beyond a complementarity of view and beyond its physiological sense: it acts in the apprehension of space, evokes feelings, memories, and creates engagement.

The sound environment consists of sounds elements that may be resulted directly by sound sources or sounds obtained through processes established by interfaces: recording, reproduction, synthesis, and others which generate abstract constructions. The juxtaposition between sound and physical environments is always present in space's configuration due to the characteristic ubiquity of the sound environment. Still, the use of interfaces promotes other situations in which these combinations can be reconfigured. The processes established by sound interfaces are not neutral because they inscribe social, historical and cultural processes and purposes.

Hybrid environments are created by the combination between physical and virtual instances and can be verified in a crescent scale on daily lives. The architectural space becomes denser by the virtual instances which give to its physical nature a hybrid character (Tramontano 2007, p.49). This process of hybridization is given by the use of interfaces, information and communication technologies, electronic and digital media, and can be considered as a powerful mechanism of bringing forth not-so-noticed characteristics of space.

The use of digital and electronic media associated to the context of diverse sound arts, which are difficult to determinate among the many existing categories, strengthen the possibilities of urban space sound interventions. Interventions aggregate information or attach new manners of musical and artistic expression. It makes cultural expressions emerge, either from the group or artist, or providing and creating means for audience expression.

2.2. Sound interventions: the use of interfaces

In this paper, the term "intervention" is proposed in opposition of "installation". An intervention may be considered as an intentional change which has previous contextual dimen-

sion. An intervention is inscription in a broader and more complex flow which is the urban dynamics and implies to understand the city as something in motion (Peixoto, 1998). Being space formed by physical instances and also its own dynamics, an intervention should consider space's previous context to act.

Interventions may take into account different meanings that space may already have. It is a contextualized relationship with the city. Considering interfaces as connectors that form a field of interchange where parts communicate, interventions which make use of interfaces provide a change of certain situation in space as well as are relevant in an epistemological aspect: they may foster questions and thinking among people involved. Thus, interfaces have the potential to provide a field where representations and interlocutions happen, beyond action and consequence, providing and creating hybrid environments. Therefore, there is a broader and less technological approach to the meaning of interface.

Regarding interface, Bolter and Gromala (2003) consider interface as the form a dispositif presents itself to its users, which should be adaptive and visible. The authors use metaphors of windows and mirrors to argue that interfaces should transit between transparency and reflexivity: windows by framing perspective, allowing the user look through and not at the interface, and maybe also as an extension of what can be seen; mirrors because reflects the context, assisting the users to perceive themselves and understand their own context.

Considering sound interfaces as only sound generators or reproducers may offer a technical concept, besides crowding a multitude of physical and virtual instances, placing acoustic, electronic and digital media into a single category. Nor is appropriate considering sound interfaces as transducers, coding and decoding sound data, and describe them only as technological mediation tools, not considering the whole inscribed process. Sound interfaces are considered as connectors which build a field for interlocution and interaction, consisting in elements which sound plays an important role. Sound interfaces change and transform modes of listening as well as sound production. Depending on the desired results at the end of the process, production may be directed to this end. Thus, sound interfaces contain an interdependent process which is not neutral but guided by intentions, purposes. Sound interfaces can also increase the diversity of sound environments through its technological mediations: the listener is no longer limited to its surroundings, i.e., is no longer required proximity between listener and sound source at the same time, despite the differences caused by its process and by its technological nature.

When held in public spaces in the city, interventions are immersed in a site that is not impartial and has its own context and dynamics. Thus, there is a two-way communication between public space and intervention: space's contextual dimension that should be consid-

ered in the concepts of the intervention; at the same time, the intervention that momentarily alters these dynamics.

Public is not only physical and social spaces of interaction: public also includes to the essence of the communication which takes place in a common social-cultural meaning, shared interests and values, transcending the private sphere (Castells 2008). According to Castells (2008), the public sphere is also “the cultural/informational repository of the ideas and projects that feed public debate”. A public space is not formed only by urban furniture or a physical space built with the intention of being a reference or meeting point. The public exists due activities, absorption and appropriation of space by people. Sound interventions, using interfaces, may foster discussions and ideas, establishing a locus of communication where the *public* happens.

Sound interventions, due to the conversational relationship between sound and space, have potential to change space's apprehension by fostering questions and thinking that would not show up in daily situations. Moreover, being endowed with cultural content and being capable to dialogue with diverse space's characteristics, interventions may arise propitious communication loci, which are formed only by its use for public debate and expression.

3. Urban Reverberation: sound intervention in public space

3.1. Conceptualisation and context

Inside a broader context of research, the sound intervention firstly aimed to explore and investigate relationships between sound and space through collective listening by the use of sound interfaces, enabling a dialogue between the intervention and the previous context of space and the city.

The train and the railroad are part of the historical, economical and social context of São Carlos. In a brief overview, the railroad contributed to the city economy in the late 19th century due to the coffee agriculture and directed urban expansion and promoting processes of socio-spatial segregation. There are not any passenger's trains at this railroad for decades; its use nowadays are only directed for cargo and serves regional interests of trade integration between Brazilian states. By this scenario, it is possible to observe that the railroad

had importance in São Carlos nevertheless its present path seems to be incompatible with the urban life of a city that expanded and changed. Therefore it was chosen as a matter of discussion for the sound intervention because it is a shared subject to many city residents.



Figure 1. South-central area of São Carlos, dashed line corresponds to the path of the railroad.

Night and day, the cargo trains cross the city as well as the CDHU. In order to provide a political dimension to the sound intervention, sounds of train were recorded at its passage in the CDHU. Former researches conducted by Nomads.usp involved the CDHU social housing and its dwellers, which also collaborated for this sound intervention. The CDHU is a social housing complex located right next to the railroad, in the periphery of south of the city. It has 928 apartments, divided in 6 apartment complexes, dedicated to low-income people. The railroad is next to the apartments and buildings and it crosses the street as well.

So, after this process of research, it was decided to relocate the train's sounds to the commerce centre of São Carlos, the public square of the Municipal Market. By relocating train's sounds, the periphery got into the city centre. This process in the sound intervention is considered *relocation* instead of *dislocation* (Emmerson 2012). Dislocation refers to a negative process, as something is where it was not supposed to be in a negative way (Emmerson 2012). Due to the sound and space conversational relationship, sound gathers different meanings through this process, instead of losing meaning. It reconfigures space and, in turn, space recontextualises sound. By reproducing the set of train's sounds collectively, a common and shared matter was introduced among those people present in the square, enabling the rise of thoughts concerning an issue that may be latent.

3.2. Recording, Editing, Reproducing

"Urban Reveberation" happened on a Wednesday, started at 9 a.m. and finished at 5 p.m.. The train's sounds were played every 20 minutes. Despite not matching the reality of the CDHU sound environment, it was decided to play more often for research purposes. The recorded audio was edited to have a longer duration. This way, more people just passing by the square was aware of the sounds and the researchers had more time for interviewing them. Beyond that, the process of recording and editing shows the whole process carried out by sound interfaces.

First, only by recording and deciding the microphone placement, favouring certain sound elements of the train, indicates an intention and suggestion. Just the choice of recording the train and relocating its sounds indicates that this sound is worth of noticing. It is partially derived from the *objet trouvé*'s idea: the recorded sound is quotidian, but it deserves a more attentive listening. The sound also directs attention to a certain subject which is a basis for other derivations. By editing, sound is 'domesticated', 'sculpted' and combined with others. In Urban Reverberation, the recorded audio was edited in order to create a continuity of a longer passage and spatiality, suggesting that, sonically, a train was crossing the square.

The loudspeaker has, in effect, allowed us to set up a virtual acoustic space into which we may project an image of any real existing acoustic space, and the existence of this virtual acoustic space presents us with new creative possibilities.

(Wishart, 1996, p.136)

This process implies virtual instances, which provides a hybrid character as a result of its reproduction, juxtaposing the physical space with sound environments and reconfiguring space. The set of selected and reproduced sounds acts as a new information in the space where it is relocated and it reconfigures space.

3.3. Methods

In order to gather information during the sound intervention there were three methods of register: two kinds of video register; photo register and semi-structured interviews.

The video register was divided in two ways: one static camera, recording two minutes before, the reproduction and two minutes after it; one moving camera, operated by a researcher. This type of video register was useful and important due the fact that one register complements the other one. While the static camera gave a panoramic view of what was happening during the intervention, the changes of reaction, the moving camera was

able to record a more directional perspective, more detailed reactions. The photographic record aimed to gather the public's reactions as well as the researchers' role and organization. Therefore these registers helped the analysis of the public as well as the influence of researchers and the interface in the intervention. These registers also collaborated for providing inputs for future interventions and also for the evaluation of the intervention process.

The semi structured interviews were recorded under consent of the interviewees. This type of qualitative method favours the access of the opinions, thoughts, values and meanings the interviewees had about the intervention, its sound and the situation. The interviews aimed to approach the interpretations and thoughts derived from the juxtaposition and aided to broad the influence of the sound's relocation and its conversational relationship with space.

The basis of the questions was: 1. Have you listen the train's sound?, as strategy to initiate the conversation; 2. What do you think about the square with this sound?, intending to stimulate thinking about the current sound and space interplay; 3. This sound was recorded at CDHU, where the train passes several times, day and night, and about a thousand families lives there. What do you think about it?, with an informative character, bringing the CDHU issue and trying to stimulate the approach of different contexts or perspectives. In this article, we focus on the answers and reactions to the second question "What do you think about the square with this sound?".

65 interviews were made during the intervention: some were punctual and very short, others had complex thinking. Some explanatory leaflets about the intervention were also distributed.



Figure 2. Diagram corresponding to the methods and the dynamics of the intervention.

3.4. Listening modes, Reactions and Interpretations

The visibility of the technological system such as speakers, cables, mixer and the computer, does not lie only in the technical aspect. Its visibility was an important factor to the intervention as a whole, denoting an intention, something new about to happen. Due to the collective listening and the ubiquitous characteristic of sound, the people present in the square didn't have to "go" to the interface. They could listen the reproduction in most part of the square.

The speakers became referential points, corresponding to the sound source. The equipments also reports the processes inscribed in interface, recording and reproduction, and suggests intentionality. The relationships between view and listening appear very intrinsically in the interviews and videos registers. The attempt of correspondence between view and listening demonstrates the referential listening as discussed by Katharine Norman (1996).

Being acousmatic because of reproduction system, the listening may reinforce the attention. Considering sound as an element which may cause mental images, memories and emotions, the set of train's sounds in Urban Reverberation, easily identifiable, can provide a stimulus for subjective associations according to the experience of the listener. As Michel Chion (1994) explains, the causal listening is when the listener seeks the sound source, but it also gathers an imaginative thinking when the listener can imagine physical aspects of the sound source when it cannot be seen, like in Urban Reverberation.

"I was searching, because there is no train here."

"I don't think it is bad, I just was searching for it, I said 'wow guys, there's a train noise, where is there a train here?'"

"I even found strange huh, I was coming here and I looked... that one said "it comes from the market!" then I said 'Not, it's not from there, I think it is the train far away from here [at the station]!'"

"I think it is cool. I live far away [...] I didn't know it wasn't the sound of a real train and then I saw the speakers [...]"

However the change of context offered by the interface, some comments, photos and videos show people searching for the sound source. It is also a search for spatial reference, not in the sense of total loss of physical space referential, but searching for spatial dynamics in order to justify the sound; to build relationships between the sonic experience and temporal reality.

Many answers to the question "What do you think about the square with this sound?" were vague or merely adjective, establishing dualities. "Noisy", "cool", "annoying", "interesting", "good", "bad", "odd" and others. This occurred due the fact it is a dense question: albeit the question was simplified, it still has a very abstract character and it is usually difficult to describe sounds in a qualitative way. Despite of that, many interviewees answered to the question based in their immediate context in the square and, on the other hand, their own previous knowledge and experiences.

"I don't see many differences because next to my home, for example, the train passes and the sound gets worse every day. I felt strange because it is here downtown."

"I like it. It remembers me. [...] I lived ten years like this..."

"It is bad. 'Cause I have already lived in a place where the train passed. We were sleeping and, wow, woke up thinking that the house would fall down."

"I have lived at Vila Prado [residential neighbourhood close to the railway], 19 or 20 years, I was born and raised there. So I always played at the railroad. Thus from home it was possible to hear the noise of these trains. I always liked it."

Some comments demonstrate an association between the context of the market square and the relationship people have with their homes, which characterises the role of the interface as a mirror (Bolter, Gromala, 2003): in such cases, the interviewee makes a direct correspondence to his/her own context, since the interviewee has a past that can be related, lives near the railroad or somewhere else where the train can be heard. Moreover, is remarkable on some comments the strangeness to the situation, often due the exchange of contexts.

The contextual listening (Norman, 1996) may also be referred in Urban Reverberation. It joins reflection and reference, concerning the conceptual meanings of the sound through private and personal associations. The evaluation of the sound given by the listener joins the current context and experience, influencing the imagination about the sound and its meanings. By the exchange of context, the listener can build relationships among lived experience, context and sound material, which are inter-related and evaluated. Thus the affective memory takes part of the listening process in which the memory's qualities of subjectivity and affection motivates the engagement of listening.

Some groups indicated attitudes directly related to the sound. People began to look at each other, sometimes laughing, and many others pointed to the speakers. A woman pushed a man she was with, playing with the sound and context like there was a railroad and the train was passing. These attitudes show that the listening occasioned by the intervention caused changes in relations between some groups, also responding to the sound with their attitudes.

The set of train's sounds is a representative element which rouses listening as an active practice. The recontextualised sound brings forth shared subjects to many city dwellers: it inserts aspects which are related to the quotidian routine of many people, and it happens through the sound environment. Through sound a possible communication locus is formed, acting as a convergent point that incites thinking and reflections, which can be externalised or not.

4. Findings

Practices as sound intervention in research aids its scope by approaching it to a wider and more diverse audience and also creating opportunities to the approach of the researcher to different communities. Concerning this, in Urban Reverberation the researchers got access to a broad set of answers with different qualities, including people at different ages and who live in different neighbourhoods. Thus the intervention as a procedure of research allowed a situation that was an alternative and differentiated way to explore sound-space interplay, getting answers and observing different people, and also proposed a communication locus.

The inscribed processes of interfaces include social and cultural processes and the sound interfaces collaborate to a qualitative leading of sound interventions and also reelaborate conditions concerning listening and sound production and it can be availed the propose of the sound intervention.

The juxtaposition of sound environments is made possible by the use of interface, which generates in the intervention a favourable locus for various interpretations and reflections not only related to sound. It is not about a total relativism, when each one has a unique impression that generates a diversity of interpretation that undermines the achievement of objectives, but rather singularities which can be embraced in a set of themes that shows the produced features and understandings regarding the sound and space relationship.

Denis Smalley (1996, p.86) argues that the apprehension of musical content and structure is connected to a world which is outside of the composition: not only auditory experience, as well as non-sonic experience. Although this argument refers to music, it can also be perceived in the Urban Reverberation. From various perspectives, the recontextualised sound became a material which motivates interrelations of a broad field of references. In many comments, some people related the sound intervention to their own experience, way of living, history. Making a parallel with the thought of Bolter and Gromala (2003), it is possible to understand the sound interface in Urban Reverberation as a mirror and window: as a window, it allows the contact of people to other reality through listening and it also delimitates a common subject; as a mirror, the interface proposes a field of reflection related to the train, the railroad and its use and impact likewise about their experience. The space, dynamic and heterogeneous, becomes denser by virtual instances (Tramontano, 2007), the edited sound, and gets a hybrid character.

At last, one perspective of future research can be summed up as the study of social and urban potential of sound interventions which can aid the manifestation and appropriation of what is public, opposed to its silencing.

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