Contents

Editorial: *Linda O Keeffe*

This issue of Interference asked authors to consider sound as the means to which we can explain the sonic. Contributions to the study of sound, apart from practice-based works, are often disseminated through language and text. This is the case for most analysis or research into sensory based and phenomenological studies. There is of course a strong case to be made for text; it is the universal way in which contemporary knowledge is transmitted. But perhaps there is an argument to be made for new ways to not only explore sound but to disseminate ideas around the sonic. For example, in what way can 'sonic papers' represent ideas about the experience of space and place, local and community knowledge? How can emerging technologies engage with both the everyday soundscape and how we 'curate this experience'? What is the potential of listening methods as a tool to engage community with 'soundscape preservation' and as a tool to critique and challenge urban planning projects?

This issue presents a series of papers by authors, who, in their research and practice, have taken up this methodological challenge. They argue for a revision in how we present sound theoretically as well as pedagogically. In addition, each author approaches their field using the already available discourse around sound related to their particular practice, while treading the difficult, but not impossible, trans-disciplinary (TR) model. TR research often employs prescriptive, practice based and normative approaches to everyday problems, but each element of a discipline carries with it the weight of its own histories and discourse. This can be problematic when trying to find an interrelation of knowledge; we must take into account the diversity of perceptions of each field. Yet as each author explores this TR approach, they also present models of innovative pedagogic practice, tied to the epistemic routes of particular disciplines, yet wholly concerned with sonic discourse.

Merate Barakat and Michael Weinstock ask the reader to reconsider the nature of the city soundscape as a morphological one. They state that cities should be treated in a similar way to the bio diverse spaces of nature, where the impact of shifting ecological factors shape species behaviours and the general environment. Spatial design needs to consider the biological elements of a city, including the production and maintenance of localised sounds. Urban ecologies are impacted on by such events as increased temperature due to the ever-growing pollutants within cities as well as the absorbing and reflecting nature of certain building materials. They suggest that sound too is affected by these "changes in atmospheric pressure and relative humidity" further affecting urban ecologies, presenting the city as a living and sentient biosphere, with communications - biological and technological - running through similar infrastructural processes. In presenting the city as a morphological space, both biotic and abiotic, where sounds are tied to certain spaces, connected by the availability of energy (consumable materials) and diversity (cultural and material), they offer a unique case for the merging of architecture and design with ecology studies. In essence, this is a refocus of 'top-down' approaches to not only the development of cities but to how, as biological entities, cities in the future must be able to support a healthy and diverse ecosystem of human and non human species.

Nicola Di Croce, on the other hand, suggests a 'bottom-up' approach to urban planning and development. The author argues that the lack of a listening awareness or a language to discuss sound by communities has an impact on both urban planning and design. City

planners and managers can, in effect, reshape city spaces, without taking into consideration the importance of community soundscapes, local or traditional sounds. He further states that it is the historic soundscape that is key in identifying sites of sonic significance because they reflect or reverberate past and current practices within community places. Reflecting Shafer's case for the acknowledgement of the importance of the 'archetypal sound', a sound inherited from the past, he argues that it is necessary to develop methodologies for communities and policy makers for the preservation of historic or meaningful sounds in the everyday. It is only through developing listening strategies that a community can trace changes within the soundscape and link them to the devolving of social and productive practices.

Finally he argues for the development of a "repertoire of innovative sonic methodologies", which work to educate a public in listening methods while understanding that there are still inherent inequalities between expert and novice.

Dylan Van Der Schyff's paper presents pedagogy for phenomenology within creative arts practice, grounded in the principles of Husserl and Don Ihde. He provides a discreet yet thorough overview of phenomenology within perception, allowing us to better understand a potential process for teaching a 'phenomenological attitude'. He argues that praxis involves "the development and integration of a range of technical, theoretical, cultural and ethical understandings that are relevant to the lives of students and teachers". He further asserts that the arts can be used as a process of sense making in the everyday, which becomes a fundamental pedagogical process. This approach reflects the Interpretivists model whereby the artist - educator - student - examines the world subjectively, understanding that each experience is tied to the surrounding social and cultural environment, while recognising the growing role of technology in praxis and what often seems like the unlimited potential of the tech tool. A case for reflection is argued - otherwise we risk "a non-critical celebration of new technologies" which "may contribute to a passive reliance on digital devices, a false sense of one’s own creative engagement". The paper presents two multimedia projects that are potential case studies for student engagement with sound and other forms of media. These media types allow for an emphasis on the importance of sound in critical theory as well as perceptual and phenomenological study - a brilliant tool for both the artist and educator. As in other papers in this issue, the author is looking at a cross synthesis of theories and media platforms, for which sonic educators and artists can work with to further the discourse of sound as praxis and pedagogy.

Focusing again on pedagogy and praxis, Frank Dufour presents an analysis of a teaching method he designed and taught, which places a strong focus on sound as 'object' for future sound designers. A number of authors for this issue have presented a case for the reconfiguration of phenomenology to be more sonically focused than previous research, stressing the importance of sound as an equal part of the field of sensory studies and not one that is relegated to supporting visual experiences (Sterne 2003; Truax 2000). Dufour's teaching practice explores the inter-relationship between sound, eye and body, particularly in the field of sound design for audio-visual environments. This 'phenomenological method' trains the student to think of sound and then to describe and design sound based on a

heightened awareness of sound types, sound meanings and the development over time of increased auditory awareness. He has adopted 'Schaeffer's typo-morphology of the sound object'; this allows students develop a language for sonic experiences, one that he argues is verifiable within sound design research. The paper's explanation of Schafer's typo-morphology may initially seem overwhelming in its detail, but when the description of the process is applied to practice, (in particular, what the students learned and how this was then applied to sound design in practice) the value of the method becomes very clear. From this point on the student moves from understanding the sonic object to thinking about sonic structures using Temporal Semiotic Units (TSUs). This is a process that examines sound or musical structures as temporal units or segments. This paper, like Gerloff and Schwesinger's (see below) recognises the importance of using and working with sound in praxis; sound and listening become the tool, method, practice and process for learning about sound.

The work of Milena Droumeva finds natural links with that of Van Der Schyf through the development of a sensory studies project using mobile technologies. Droumeva explores the ubiquity of the mobile phone and its potential to explore and remediate everyday sonic experience. She focuses on mobile devices, particularly how phones have become "increasingly integrated into and co-constitutive of the very fabric of everyday experience and perception"; therefore, adapting this tool for sensory-based public engagement seems like a logical move. The convergence of media since the 2000's works in two ways: as a technological shift in processes and practices, as well as a shift of the audience/consumer engagement. However, the author adds to this a shift in our perceptual engagement with the everyday.

Using a number of applications, which document audio, visual and text based information, participants of her research project engaged in a practice of 'Curating the Self'. Each participant created a work, which is an analysis of a sonic and everyday experience. They then frame that within contextual sensory data, sometimes video, sometimes audio. It is then argued that the ubiquitous nature of mobile technologies has allowed for this explosion of self-curated experiences, which in certain contexts allows for a purposeful examination of everyday sensory experiences. However, there is also a need for critical reflection on this technology. Its ease of use in documenting every experience and every moment of every person's life, which then unfolds in mediated social spheres, is less concerned with framing an artistic experience and more with mediating every social and even non-social experience.

Felix Gerloff and Sebastian Schwesinger have taken on the process of shifting the textual discourse of the sonic back to sound - the audio paper format - and then back to text. Through an examination of sonic epistemologies, guided by a reworking and reconfiguring of Steven Feld's work on the Kaluli culture, they suggest that it may be possible to present notions about place and space *through* and with sound. In their paper they discuss a presentation they made for which two sites of significance were discussed 'using the sonic format'. These sites - spaces undergoing unique physical transformations - were altering not only the soundscape but also the experience of place as it is shaped by sound. Using Feld's

method as a starting point, they explore sonic meanings and interpretations. However, the authors critically adopt a creative - even interpretive – approach, playing with meaning and non-linear narrative to present these spaces as sonic stories. The difficulties of sound as a medium to present semiotic metaphors or meaning are highlighted, but equally the potential of sound as a medium of meaning different to that of text. More importantly, it is suggested that it is not necessary "for a sonic pattern found in analysis to be rendered audible in the audio paper". Instead, one can use other models of analysis, including creative ones, which may provide an alternate reading of space and sound. Those working in the fields of the senses and phenomenology often consider this contradiction: how can one express ideas about perception solely through language? De Certeau argued, for example, that maps, a cartographic narrative of space, ignore the subjective experience of walking through space. Yet text and language is the common tool which all disciplinary discourse falls into. Gerloff and Schwesinger argue that perhaps there could be a common form of discourse related more specifically to a discipline. If sound is the discourse of space, then 'how' space is presented should be through sound.

Yiannis Christidis & Michael Quinton present their methodological approach for examining two distinct urban spaces: Cyprus and Malta. Taking the traditional approaches of soundwalking and listening, sound mapping, as well as traditional sociological methods such as interviews, they explore, current and past soundscapes. While there have been a number of studies - both in practice and within theoretically grounded research - on the meaning of sounds within space, and to locals, it is always important to explore the unexamined cultures lest we think the sonic experience is generalisable. The authors argue that we must approach each space of study as places of 'variety' with 'diverse cultural elements', which shape not only perception but also 'meaning making'. They state that Mediterranean cities have evolved along unique growth lines, different to their northern European counterparts. A piecemeal approach to growing city populations has meant that housing areas have evolved as large sprawling areas with little or no green areas or planned pedestrian routes such as footpaths or roadways. These contribute to unique soundscapes, as there are no clear demarcations between communities. In cities such as Malta and Cyprus, a lack of foresight in urban planning failed to include interconnecting green belts between zones of habitus, a now recognisable format in city planning since the 1960s in Europe. Like Barakat, Weinstock and Di Croce, they point to urban planning and urban design as significant to the shaping of city soundscapes. Their findings have highlighted how the uniqueness of the local cultural temperament as well as the actual temperature of these spaces (we often associate the Mediterranean with heat), significantly shapes auditory perception and connection to space.

People live their lives at street level engaging and contributing to the everyday soundscape, creating a unique sound profile that can be added to the annals of knowledge of the growing confluence of a world soundscape study.

Sterne, J., 2003. *The Audible Past: Cultural Origins of Sound Reproduction*, USA: Duke University Press.

Truax, B., 2000. *Acoustic Communication* 2nd ed., USA: Praeger.

Protected: Emerging Urban Aural Patterns: Finding Connections between Emergence in Architecture and Soundscape Ecology

By Dr. Merate A. Barakat & Dr. Michael Weinstock

Abstract

Cities are dynamic, spatial and material systems that exhibit power scaling and self-similarity across a range of scales. Spatial designers are informed by mathematical and biological systems and use concepts and processes abstracted from them to analyse the emergent phenomena of dynamic complex systems. Although there is an increasing interest in integrating aural perceptual phenomena within the discourse of spatial design domains, both of these fields continue to develop separately. Urban factors, activities, and morphologies determine the aggregate pattern of aural spaces. In turn, the sonic character affects social order within urban patches. Currently, borrowed epistemological concepts are integrated into both domains, where emergence of architecture and soundscape ecology form the current state-of-the-art for research on urban and soundscape design, respectively. This paper explores soundscape ecology as a point of departure to build on the theory of emergence in architecture by drawing parallels and contrasts between these two domains.

Keywords

Architecture; Urban; Design; Research; Emergence; Soundscape; Ecology

Introduction

Soundscape studies, as a field, provided a paradigm-shift for urban design. Characteristically, theories of soundscape and urban design share commonalities. Like soundscape environments, cities are unique in that each has a recognisable ‘shapeness’ (Marshall, 2005) or morphological form. A general pattern results from a collective unitary order that defines it as a city where humans live in built and natural environments that create an aggregation of human-shaped atomically indivisible units. Programmatic designations and social unit structures determine both types of territories (built and natural). These associations are the result of the corresponding relationship between the city and soundscape.

Modern urban sonic contributions are found to affect animal populations, having profound changes on their behaviour and, in some cases, creating a growing risk of extinction. The reciprocal relationship between sounds and organisms (including humans) is presented as a distinct branch of ecological research, namely Soundscape Ecology (Farina, 2014). Soundscape ecology recognises and integrates components from the fields of acoustic ecology, landscape ecology, bioacoustics, urban and environmental acoustics, behavioural ecology, and biosemiotics (Pijanowski & Farina, 2011). This new field is part of the encompassing theoretical and applied discipline of Ecoacoustics that regards sound as a material form of ecological information to investigate the ecology of populations, communities and landscapes (Sueur & Farina,

2015). The idea of soundscape ecology was presented to a landscape ecology congress in 2009, entitled Soundscape Ecology: Merging Bioacoustics and Landscapes (Pijanowski & Farina, 2011; Farina, 2014). Other soundscape researchers from various disciplines have recognised the significance of the presented concepts (Davies, 2013).
The borrowed epistemological concepts are in alignment with the current spatial design theory adopted within the architectural and urban design research, namely The Architecture of Emergence (Weinstock, 2010a). These domains recognise that there is a characteristic arrangement of material in space within all forms of nature and all forms of civilisation. As such, these dynamic complex systems have form. Architectural shape, size, attendant organism behaviour and duration determines, and is determined by, the dynamic processes and phenomena of the natural world, and vice versa (Weinstock, 2010b).

The field of design research is turning to fundamental sciences (e.g., mathematical and biological systems) to understand how these dynamic complex systems emerge, the composition of interconnected elements, and causation within interaction (Weinstock, 2013a). Cities are no longer considered mere artefacts, they have become the largest and most complex material form constructed by humans (Weinstock, 2011). As temporal organisms, cities are dynamic spatial and material systems that exhibit power scaling and self-similarity across a range of scales (Weinstock, 2013b).
These concepts have been integrated into spatial design research at various scales ranging from climatic research of forest patterns (Greenberg & Jeronimidis, 2013; Yu, et al., 2014), city infrastructure; micro-scale urban morphologies (Aish, et al., 2013); intelligent building systems (e.g., form-finding and structure) (John, 2014; Sarkisian & Shook, 2014); building envelope (façades) response to environmental factors; and biomimetic material investigations (Kotnik & Weinstock, 2013). The assimilation of biological and mathematical models allows for designing computational models for social, environmental and material inquiries (Tamke, et al., 2012; Narahara, 2013; Sarvani & Kontovourkis, 2013).

The connection between the overall domains of soundscape and spatial design is limited to rare theoretical references and there seems to be a lag in considering this interaction, specifically in the recent research. The appraisal of the concept of soundscape should depend primarily on its association with the setting (or context) in which it occurs (Carles, et al., 1999). The majority of soundscape literature follows Schafer's (1977/1993) focus on the taxonomy of a soundscape as a distinct and separable entity from the environment or ecology (Carter, 2003). Raimbault and Dubois (2005) suggest that there is a relational correspondence between the soundscape and urban morphologies which may be examined with reference to the informational content of the sound signals present. Urban soundscape analysis depends on the identification of the activities occurring in the urban space. Characteristic urban morphologies propose settled functions, which are activities that create various soundscapes. In return, sounds (like keynotes and soundmarks) could subsequently shape territories (Raimbault & Dubois, 2005).

Nature and Civilisation

Soundscape ecology defines the soundscape as *"the distribution of sounds across a landscape when the landscape is considered a geographic entity and not a complex cognitive agency"* (Farina, 2014, p. 3). Akin to the broad scientific and educational context of ecology, soundscape ecology considers the term soundscape as the geographic distribution of multi-source sound perceptions (Farina, 2008). Similar to other research into emergence, the ecological soundscape is regarded as a result of sounds produced by agents (i.e. biological, geomorphological or mechanical). There are two types of agents: 1) abiotic, and 2) biotic, which are first perceived and then subsequently interpreted by organisms (Farina, 2014). Overall, the global domain of soundscape and its associated concepts recognise soundscape as a regional sonic context and a cultural field that significantly contributes to defining the characteristics of a region, culture and heritage (Scarre & Lawson, 2006; Cain, et al., 2013). Humans are considered one of the agents. Similarly, a city is described as a congregation of organisms inscribing its associated biological heritage within its boundaries. Urban morphology is shaped through the contiguous temporal behaviour of the collective. Such territories are claimed, formed, and developed as a result of the inhabitants' behaviours, as dynamic spatial, energy, and material systems of spatial unit arrays (Weinstock, 2011).
The perpetual construction, recondition and growth episodes of territories result from their associated informational network systems (communication, food, transportation, and industry) that are constantly expanding (Weinstock, 2013a). From this perspective, cities are not merely stand-alone entities aggregated by static arrays of building structures and concrete street networks, but exist within a hierarchical environmental system that acts on the associated subsystems. In turn, the flow of energy and material across the boundaries of each system modifies the whole (Weinstock, 2010b; 2013b). The concept of information network system constructing the sonic ecological structure is as complex as a city's infrastructure.

There are three categories of ecological sounds that are strictly related to the structure and function of geographic landscapes: 1) *geophonic* (e.g., wind, flowing water, volcanic eruptions), *biophonic* (e.g., alarm or song vocalisations), and *anthrophonic* (e.g., industrial and urban activity) sources (Pijanowski, et al., 2011). The biophonies are defined as the sounds produced by biological organisms and are directly influenced by geophonies and anthrophonies. High levels of the two latter sound categories depress or modify the biophonic patterns (Krause, 2012; Bucur, 2007). In return, urban soundscape research explains that these natural sounds (birds' songs and water features) are preferable to humans and create a sense of well-being and relaxation (Kang & Zhang, 2010). The strict and continuous contacts between sound and both built and natural environments emphasises the importance of the sonic context in shaping evolution and reinforcing the cognitive sense of place for all organisms, including humans, influencing their culture and heritage (Farina, 2014).

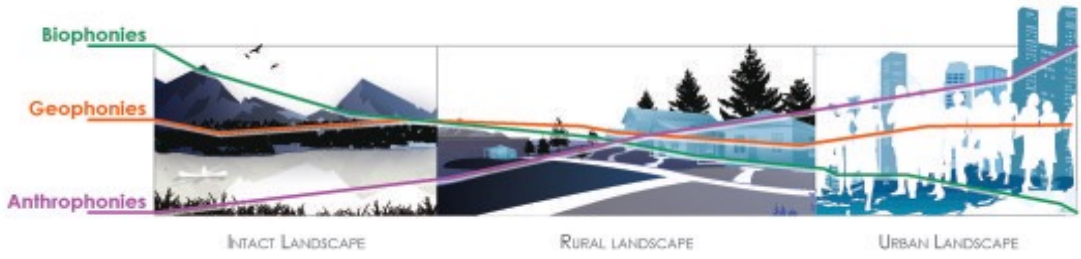


Figure 1
As the human intrusion increases along a gradient from intact Landscape, through the rural landscape, and urban landscape, geophonies seem to remain constant, but biophonies decrease and the anthrophonies increase. Graph information adapted from (Farina, 2014)

Climate and Forms of the Atmosphere

The informational network systems within a landscape maintain a choreography of energy and material exchange between contiguous systems that mediates and is altered by an encompassing metasystem, namely the climate (Weinstock, 2010a). This holds true for soundscape ecology and urban systems alike. The association between sonic patterns and climate relates to indirect effects of climatic shifts called phenology. Climate change is reported to produce biological responses, such as changes in the calling patterns of species, thereby redefining the associated habitat regions (or patches) (Gibbs & Breisch, 2001). The cause-and-effect relationships within the cityscape and the multitude of spatial and temporal scales involved result in the emergence of a "patchwork" system of local climate zones. These formations are associated with complex surface geometry structure, cover, fabric and metabolism (Mills, 2008).

Urban climatologists traditionally separate urban climate zones from rural (or countryside), as two distinct domains. Recent research finds that the surface features defining cities (people, cars, buildings and industries) release heat and pollutants directly into the atmosphere and modify the surface thermal, moisture, and aerodynamic regimes, creating distinguished local city climate zones (Stewart, 2013). This segregation of climate patches is a hierarchal system occurring across a continuum of scales and systems. Specifically in terms of the sonic ecology, the predicted effects include the absorption of lower frequencies and the enhancement of higher frequencies with the rise in temperatures, and changes in atmospheric pressure and relative humidity. The change in climate modifies the leafing patterns of plants that in turn alter the sonic ambience during the vocal performances of many species (Møller, 2010). Some species regulate their sound power in response to ambient temperatures by changing the neuromuscular structure of the vocal organ (Sueur & Sanborn, 2003). Consequentially, calling sites are changing, affecting sonic ambience, and correspondingly the design of songs, mating success, and prey–predator interactions (Farina, 2014).

This adaptation that modifies the associated communication sonic networks across ecological patches also occurs in the city surface network system where the inputs, output and throughputs derive the regional urban microclimates (Weinstock, 2013a). The urban morphology has a reciprocal relationship to its associated microclimates that

behave in a similar manner as ecological systems (e.g., rainforests). The formation of distribution patterns and growth strategies emerge from the interaction of climate with the energy and genetic information flow through the region, producing regional differentiation in the urban fabric (or forest) and its microclimates (Greenberg & Jeronimidis, 2013).

Surface Forms | Patch and Edge

The emerging complex patterns described in the presented epistemological domains of soundscape ecology and emergent architecture stem from landscape structure. The unified components that conceptualise landscape include the geographical description, spatial arrangement of ecosystems, and cognitive aspect of the organisms inhabiting these domains. From a geographical perspective, the landscape is a complex hierarchical system of elementary units or patches divided by ecological edges.
Patches are aggregated in further higher-order units that are components of a larger system, formulating a fractal structure. In a homogenous geographical matrix, patches represent the spatial unit, and its associated main characteristics depend on the shape, size, edge irregularities, spatial distribution, and (bio) diversity present there. Distribution and organism diversity (or cohesion) fragmentation of a homogenous patch is a result of disturbances (e.g., climatic, human). This disturbance affects the survivorship of the interior species and facilitates the intrusion of alien species and predators. If the system does not collapse as a result of the patch fragmentation and pattern reorganisation, the outcomes are not necessarily considered negative. Edges or the borders located between one patch and another is a tension zone (i.e. ecotone) through which energy, materials, nutrients, organisms, social interaction, and information pass. These ecotone edges exist at all scales, within a fractal hierarchy (Farina, 2008; Weinstock, 2010b).

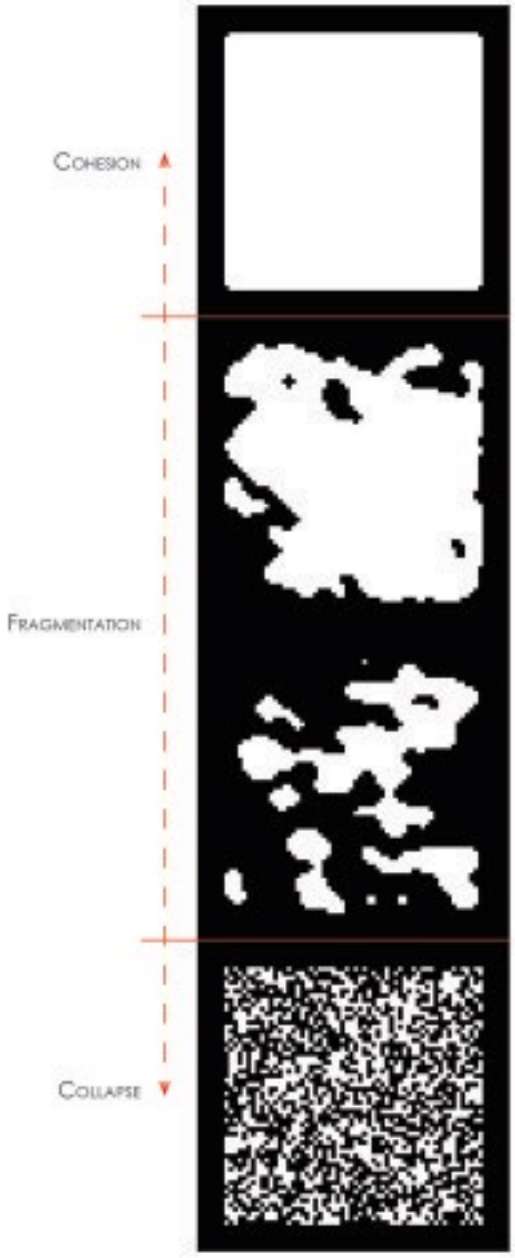


Figure 2
Dynamic complex systems are an emergent balance; it does not change or collapse until a disturbance occurs. Disturbance changes the configuration of the patch-edge relationship and creates information at the edge of the disturbance process. Patterns are generated by a simple Cellular Automata simulation code.

Patches and edges are spatial patterns while fragmentation and edge effects are processes (Farina, 2008). Soundscape ecology also distinguishes sonic patterns from sonic processes, and emergent architecture differentiates between the urban fabric morphology and the infrastructure networks mediating these formations. In urban design, the urban patch model expands on the block-street unit concept. By adopting the same epistemological concepts, the patch-edge unit configuration exists at different scales within a hierarchal fractal mathematical system. The divisions (or edges) are

associated with a multitude of factors–anthropological (e.g., social logic, transportation arteries), ecological (tectonic, landscape), and/or climatic (at micro and macro scales) (Stewart & Oke, 2009; Weinstock, 2011). Similarly, the sonic patch termed sonotope (Farina, 2014), is a distinct sonic unit produced by the inter-scaled overlap of geophonies, biophonies, and anthrophonies. Sonotopes are patterns created by biotic and abiotic sonic agents, where the distribution in time and space of the different sonic patches reflects quality, disposition, occurrence in time, and spatial overlap of sound sources. These sonic patches are delineated by sonic edges that are termed as sonotones (Farina, 2014), and defined as sonic environments that are the result of the partial overlapping of adjacent patches (Farina, 2015). For example, the distribution of sound around a waterfall or river passing through a city creates a sonic pattern mediated by an abiotic agent (Farina, 2014).

Like the concept of ecotones in ecology, there are thresholds between urban patches as well, dividing what is considered "private" territories. In the private-public relationship, these thresholds are considered "public" domains. Similarly, the sonic edge effect impacts many system acoustic functions (e.g., ranging, mating choice, territory patrolling, and acoustic partitioning). Species that cross into a sonic patch other than the one they inhabit are regarded as foreign, inserting attributes that fulfil needs or elicit annoyance. Thus, these defining borders are not one-dimensional lines but also tension zones where a social interface occurs between the two territories and where an interplay of natural, cultural and social activities are defined and practised (Lathouri, 2013).

Forms of Metabolism

The morphology, scale, and behaviour of biological systems within the associated habitats is related to their rate of metabolism. The flow of energy, information and material is vectored through the ecological system that is constructed and inhabited by these living forms (Weinstock, 2010a). Most vocal animals have complex organs of vocalisation. There is a relationship between their body mass and the frequencies utilised in vocal performances (Fletcher, 2004; 2014; Wallschläger, 1980). The acoustic energy produced is proportional to multiple factors besides the size of the species. Body mass is one morphological adaptation; it is hypothesised that organisms with large body mass utter vocalisations with a lower frequency than smaller species. Larger animals communicate at greater distances than smaller ones to cover their associated habitat and ranging domains. Organisms utilise frequencies in relation to the communication range required to reduce sound degradation. This contributes to factors of communication across sonotopes from one sonotope to another (Farina, 2014).

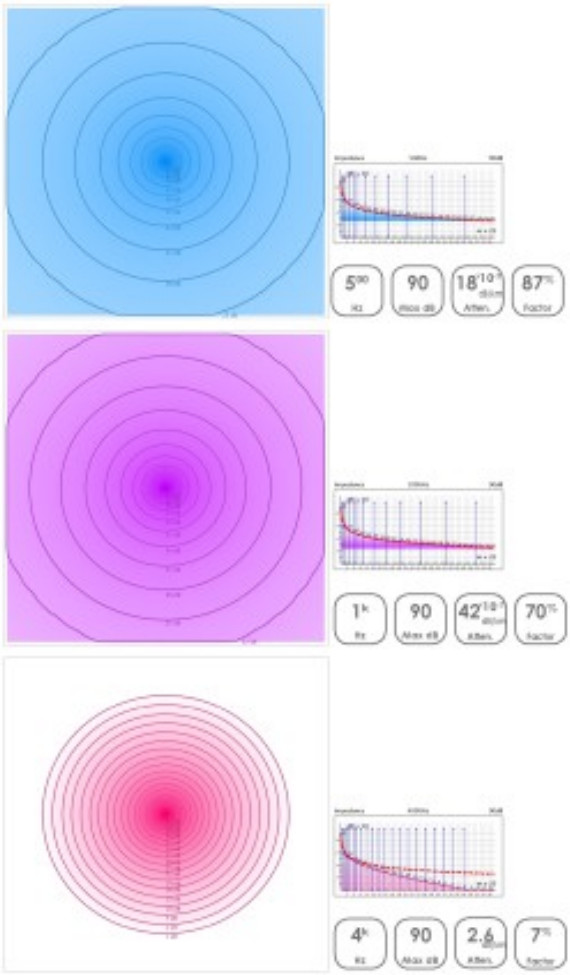


Figure 3
Lower frequency signals cover larger distances than higher frequencies. This allows increased communication ranges within a larger sonic patch. Figures generated by an Object-Oriented Programme simulating frequency dependent attenuation of the sound energy emitted from a point source in a free field.

Cities are like living organisms; larger animals have different forms compared to smaller ones. When considering a city as a biological system, the urban morphology is a porous surface comprised of cavities or edges (streets and public spaces) with material folds (buildings and blocks) (Steadman, 2008). The relationship between the texture of an urban fabric and its associated local climate and energy consumption can be mathematically expounded to analyse the differentiated material and spatial conditions across the urban surface (Weinstock, 2010a). The diversity present influences and moderates the local urban microclimate (Stewart & Oke, 2009; Stewart, 2013), behavioural conditions and energy consumption (Weinstock, 2011).
To extrapolate, if a city can be regarded as an aggregation of sonotopes within a larger sonic patch, the rate and projection of the sound energy and information flow are multi-scalar processes. The processes can be derived from understanding the differing scales and metrics of metabolic flows through cities (Besserud & Sarkisian, 2013). The size of the city is a result of the scaling patterns of its infrastructure and their aspects of information flow periodicities, velocities and quantities. The larger the city, the faster

these processes are (Bettencourt, et al., 2008), and the further the information can travel. In turn, the faster and further information can flow through a city, the faster the city grows (Weinstock, 2013a).

Forms of Information

Biological and artificial communication and information networks share common features owing to the similar operational constraints that derive them, such as spatial embedding, optimisation and self-organisation (Valverde & Solé, 2013). Sonic perception of context requires a particular capacity that has a genetic or cultural origin by every perceiving agent (humans and nonhuman organisms). The emergent sonic configuration creates a context in which sonic information and acoustic communication represent tools these organisms use in active and passive cognitive processes. The complexity that emerges from the information contained in a soundscape can be analysed and interpreted by the application of functional models (Farina, et al., 2011).
Similar to the acoustic communication theory developed by Truax (2001), there is a sender-receiver connection where an informative signal vectors through an informational conduit, namely the acoustic channel. This channel is an important component of an organism's life (reproduction and survival) and the cohesion and growth of the populated sonic patch. The acoustic information provides orientation and organisational cues that agents employ to find resources, to avoid predators, and to find or adapt locations for reproduction (Farina, 2014).

In terms of metabolism, species' communication is costly, thus, organisation and physiological attributes are employed to create a communicative framework and overcome environmental factors (topography, vegetation cover, and natural or anthropogenic noise-masking) that influence the communication channels (Farina, 2014). In long-distance communication, types of acoustic adaptations occur that are correlated with the habitat acoustics to maximise the transmission efficiency (Morton, 1975). Transmission of energy (including sound) in an urban context occurs through various communication channels, such as infrastructure networks. The urban morphology and density and the evolution of communication and transportation technology stimulate the energy and material flow through cities (Weinstock, 2011). The advancement of infrastructure systems configuration creates a shift that is based on multi-scalar patterns, and variable speed of that flow can produce emergent spatial configurations (Mangelsdorf, 2013).

The reverse process of fragmentation is connectivity, in which isolated patches are secondarily connected to the network (Farina, 2015). Biological and cultural networks continuously grow by the addition of new nodes (or hubs) that are commonly located at a central position of a patch. The new nodes predominantly attach to already well-connected nodes. Consequentially, the topology of the whole network has only a few nodes that have a high number of connections and that are linked to all the other nodes that have lesser numbers of connections, progressively. The flow volume, velocity and patterns of energy, information and materials predominantly vector through the highly connected nodes (Weinstock, 2011). The number and size of the network nodes and connections configuration determine the complexity of the system and the flow rate of

information vectoring through the network. It is worth noting that the complexity of the information system is the critical determining flow factor.

Characteristically, urban sound sources are positioned locally within the network nodes, and can be perceptually experienced through the infrastructure network (via information media). Infrastructural networks exhibit some similar characteristics to those exhibited by the branching metabolic networks of living forms, which are emergent quantitative features based on empirical scaling relationships (Weinstock, 2013a). For example, low-frequency signals travel through vegetation more efficiently than high-frequency signals, and short, repetitive signal bursts travel longer intervals in dense vegetation. Therefore, for biophonies, environmental constraints are a factor in choosing the calling frequency band, where species change their spectral patterns to avoid competition or adopt frequency bands that have lower degradation (Farina, 2014). Although this holds true for smaller urban-scale sonotopes, such as urban public spaces and socially contiguous districts, technological advancement in communication overcomes some of these constraints for long-distance human and social communication.

The emergence and development of the twin factors of high-density fossil fuel and equally high-density information systems has enabled increasingly rapid acceleration in the rate of growth of human populations over the last two centuries. The flow of information and energy has accelerated accordingly, the population of the world is rapidly expanding and the complexity of the world's system continues to increase. The energetic expense of complexity in the system continues to accelerate, with increasing numbers of people in specialised roles to generate and process the flow of information, and in manufacturing, constructing and maintaining its physical infrastructure. The emergence of the urban topologies and physical architecture of the network systems is a result of the interdependencies and integration of differing infrastructural systems (Weinstock, 2011). Information flow through such infrastructures has a reciprocal and intricate relationship with the urban morphology and growth to an extent that cities can be considered sentient or conscious. The term "smart city" becomes a much more profound description of its metabolic flow processes and emerging morphology (Weinstock & Gharleghi, 2013).

Organisation and Emergence

Emergence is mediated by the autonomous behaviour of social organisms. The interaction and coordination processes between these living forms create organisational configuration within patches and across edges, which results in a whole complex system exhibiting an intelligent collective behaviour. The sonotope paradigm is potentially subdivided to a further coordinated organisation, namely soundtopes (Farina, 2014). The soundtope is considered an active intra- and interspecific vocalised coordination employed as a strategy to reduce foreign intrusion in a private local community. The complex mechanism of information exchange dictates its intensity and duration (Hoffmeyer, 2008). A collective community with specific goals that are independent of environmental constraints creates a soundtope, which is a fundamental sonic pattern that has more information than a sonotope. The sonotope is determined by environmental constraints while the soundtope is a patch that emerges from the inhabiting life forms' behavioural processes (competition, courtship, etc.) (Farina & Belgrano, 2006; Malavasi

& Farina, 2013). At the edge where two sonotopes come into contact, a stochastic acoustic configuration occurs across the heterogeneous medium. A complex sonic area then emerges where signals cannot be properly de-codified due to masking and overlap (Farina, 2014).

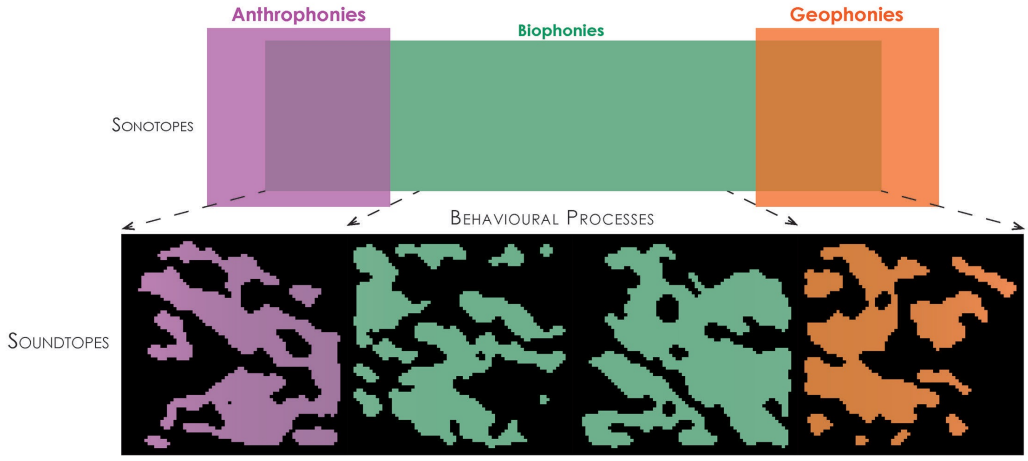


Figure 4
Sonotopes are a result of the spatial overlap of geophonies, biophonies and anthrophonies. Inside a cohesive patch, the behavioural process of the inhibiting agents creates distinct hierarchical domains, namely soundtopes. The same holds true for other information and material exchange for all life forms. Information obtained from (Farina, 2014).

As in biological complex systems, urban elements are interconnected in an integrative process where, in a cause-effect relationship, what is an effect at one scale may be a cause at a higher (or lower) scale (Corning, 2002). Cities are regarded as emergent phenomena that are embedded within a hierarchal system, which has a reciprocal relation to the climate and ecology at one scale and spatial variation and temporal organisation at another (Weinstock, 2013a). In both types of complex systems, the temporal changes emerge according to simple rules. When optimisation occurs and the system becomes an emergent balance, it does not change or collapse until a disturbance occurs (Weinstock, 2010a).
This emergent behaviour occurs at all scales, including urban public spaces. The behaviour and interaction of the people and technology inhabiting these domains create self-assembled communities that define the spatial morphology in addition to the building or space enclosing it (Moreno & Grinda, 2013). At the edge of these social self-organisation territories, a stochastic social interplay occurs that creates a spatial division (Lathouri, 2013). There are many examples of urban patches that exhibit morphological cohesion and stochastic interaction with the adjacent domains across an abiotic edge. One can be found in Central London between the boroughs that are currently named the City of Westminster, North of the Thames River, and Lambeth and Southwark in the south. Historically, this point along the river has maintained a strong conduit for information (energy and material) exchange. The continuous stochastic social interface occurring between these territories show in its demographic distribution.

With the construction of Westminster Abbey, the southern boroughs began, and continued, to be frequented and inhabited by people that are associated with Westminster. The geographical and political adjacency meant that this location has always been a North-South arterial link (Stanley, 2002). Since silence is a privilege, the introduction of the combustion engine may be considered one of the disturbances that changed the demographic character and urban fabric of the southern areas (LaBelle, 2010). However, the informational conduit remains strong through the infrastructure.

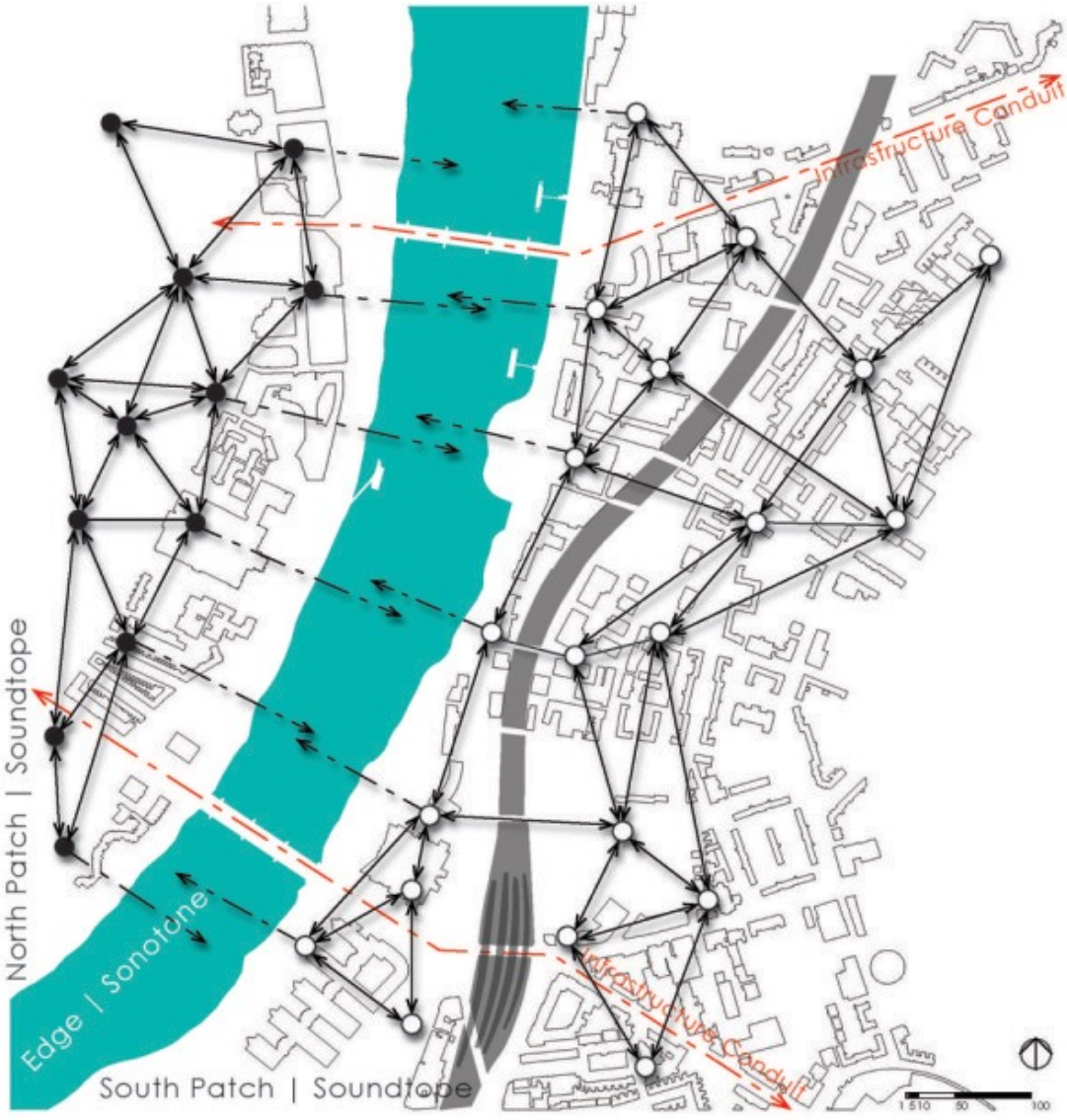


Figure 5
Across an edge (ecotone or sonotone) a stochastic social interplay occurs that creates a spatial division between territories. Information obtained from (Farina, 2014) and original digital map from (RIBA Competitions, 2013).

Communication technology has changed the concept of "local" territories, and organised communities are not only confined to proximity; consequently, homogeneous digital social patchworks emerge (Young & Davies, 2013). These communication channels are creating a further fractal division that derives urban morphology (Weinstock, 2013a).

Discussion

Ecology and climate have been, and are still, strongly coupled to the emergence of the cultural systems of cities, to their subsequent evolutionary diversifications and developments, expansions and contractions, and to their eventual collapse and reorganisation. Information flowed back from the metropolis to the colonies, accelerating their territorial expansion and increasing their complexity in turn. Increased complexity required higher levels of organisation, with increased numbers of specialists to process, manipulate and to communicate greater volumes and more kinds of information, and they had to be supported by the surplus production of energy and materials in the system. Complexity consumed energy, and each increase in complexity required a further rise in the flow of energy. The process of finding, developing and collecting more energy and materials over greater distances and larger territories required an increase in information processing and consumed yet more energy. The emergence and subsequent evolutionary development of information systems and the systems of cities were strongly coupled, each acting as a positive feedback on the expansion and growth in complexity of the other.

The distribution of information networks exhibits many similarities to the hierarchical branching of biological metabolic networks. A number of other culturally produced systems also exhibit comparable 'scale-free' power law characteristics, including soundscape. This is most likely to be generated by the way in which the systems grow through a network of nodes and hubs through which the trajectory of the energy, information and material patterns primarily vectors through the well-connected nodes. These properties characterise the evolution of biological systems and culturally produced metabolic systems. It is important, however, not to confuse the topology diagram with the physical reality. Physical infrastructures are generally massive, constructed from dense materials, with geometry and scale that do not resemble biological networks. Ecological connectivity networks are linear habitats that strategically formed to preserve biodiversity and maintain the heterogeneity of the ecological matrix.

In a continuation of the on-going inquiries of the relations between natural systems and the cultural architectural systems of civilisation, what were then standard architectural practices are undergoing a substantial reconfiguration. The force of convergence between disciplines is igniting an evolutionary process that has begun to act on the boundary between "the natural and the made". The emergence of architecture area of research outlines the cultural convergence of biology, medicine, engineering, data networks and flows, computation and material sciences in service of an argument that architectural knowledge is actively constructed, provisional, and subject to recombination and improvisations in formulations of thought and materialised forms.

Considering the processes of nature and civilisation as systems serves to accentuate the interactions and connectivity of the different parts of the systems and the interactions between the various organisms. The literature of complexity theory is extensive, with varying emphasis and different foci in the natural sciences, in mathematics and computation, economics and artificial intelligence. There is, as yet, no unified complexity theory, but a central tenet is that the concepts and processes of complex systems may be understood as independent of the domain of any one particular system.

In continuing research across differing domains that are examining and informed by the natural world as well as assimilating methodologies, metrics, and semantics from natural world disciplines, the hypothesis that cities have sonic characters and are part of an encompassing soundscape metasystem can be realised. Architecture has its own instruments and metrics for classifying and interpreting data that places them in relation to its own body of investigations, concepts and scholarship. Knowledge of the historical development of each informing discipline and how each intersects with other contingent bodies of knowledge is necessary for the identification, evaluation and selection of concepts and data relevant to any research agenda involving sound.

The consideration of sound within urban design is a nascent on-going research field, owing to the complexity of the cognitive aspects of sound. Contrary to general perception, urban sounds are not always considered pollutants. Although anthrophonic interventions do cause some sort of disturbance to biophonic patches, urban sounds like soundmarks (e.g. church bells) and sonic heritage sources can create a sense of citizenship and cohesion at the scale of urban districts and townships. Spatial designers can benefit from these concepts when designing urban spaces and the associated sonic characters. There is a unique opportunity here where the two domains—design research and soundscape—are informed by and adopting the same concepts that have been established in the natural science fields, specifically ecology. In an attempt to seize this opportunity, this cross-disciplinary discussion aims to integrate sonic phenomena with current architectural and urban design discourses and also to suggest connections between spatial design and the domain of soundscape.

References

Aish, F., Davis, A. & Tsigkari, M., 2013. Ex Silico Ad Vivo: Computational Simulation and Urban Design at Foster+ Partners. *Architectural Design,* 83(4), pp. 106-111.

Besserud, K. & Sarkisian, M., 2013. Scales of Regional, Urban and Metabolic Building Systems Design at SOM. *Architectural Design,* 83(4), pp. 86-93.

Bettencourt, L. M., Lobo, J. & West, G. B., 2008. Why are Large Cities Faster? Universal Scaling and Self-Similarity in Urban Organization and Dynamics. *The European Physical Journal B-Condensed Matter and Complex Systems,* 63(3), pp. 285-293.

Bucur, V., 2007. *Urban forest acoustics*. s.l.:Springer Science & Business Media.

Cain, R., Jennings, P. A. & Poxon, J., 2013. The development and application of the emotional dimensions of a soundscape. *Applied Acoustics,* 74(2), pp. 232-239.

Carles, J. L., Barrio, I. L. & Lucio, J. V. d., 1999. Sound influence on landscape values. *Landscape and urban planning,* 43(4), pp. 191-200.

Carter, P., 2003. Auditing acoustic ecology. *Soundscape,* 4(2), pp. 12-13.

Corning, P. A., 2002. The Re-Emergence of "Emergence": A Venerable Concept in Search of a Theory. *Complexity ,* 7(6), pp. 18-30.

Davies, W. J., 2013. Special issue: Applied soundscapes. *Applied Acoustics,* 74(2), p. 223.

Farina, A., 2008. *Principles and methods in landscape ecology. Toward a science of landscape*. s.l.:Springer Science & Business Media.

Farina, A., 2014. *Soundscape Ecology: Principles, Patterns, Methods and Applications*. New York, London: Springer Science+Business Media Dordrecht.

Farina, A., 2015. Application of landscape and soundscape ecology to the Mediterranean region. *Journal of Mediterranean Ecology,* Volume 13, pp. 21-27.

Farina, A. & Belgrano, A., 2006. The eco-field hypothesis: toward a cognitive landscape. *Landscape Ecology,* 21(1), pp. 5-17.

Farina, A., Pieretti, N. & Piccioli, L., 2011. The soundscape methodology for long-term bird monitor- ing: a Mediterranean Europe case-study. *Ecological Informatics,* 6(6), pp. 354-363.

Fletcher, N. H., 2004. A simple frequency-scaling rule for animal communication. *The Journal of the Acoustical Society of America,* 115(5), pp. 2334-2338.

Fletcher, N. H., 2014. Animal bioacoustics. In: T. D. Rossing, ed. *Springer Handbook of Acoustics*. New York: Springer New York, pp. 821-841.

Gibbs, J. P. & Breisch, A. R., 2001. Climate warming and calling phenology of frogs near Ithaca, New York, 1900–1999. *Conservation Biology,* 15(4), pp. 1175-1178.

Greenberg, E. & Jeronimidis, G., 2013. Variation and Distribution: Forest Patterns as a Model for Urban Morphologies. *Architectural Design,* 83(4), pp. 24-31.

Hoffmeyer, J., 2008. The semiotic niche. *Journal of Mediterranean Ecology,* Volume 9, pp. 5-30.

John, W. A., 2014. *Towards an Intelligent Architecture: Creating Adaptive Building Systems for Inhabitation*. s.l., Blucher Design, pp. 328-332.

Kang, J. & Zhang, M., 2010. Semantic differential analysis of the soundscape in urban open public spaces. *Building and environment,* 45(1), pp. 150-157.

Kotnik, T. & Weinstock, M., 2013. Material, Form and Force. *Architectural Design,* Volume 83, pp. 92-97.

Krause, B., 2012. *The Great Animal Orchestra (Enhanced): Finding the Origins of Music in the World's Wild Places*. New York: Little, Brown.
LaBelle, B., 2010. *Acoustic Territories: Sound Culture and Everyday Life*. New York: Continuum.
Lathouri, M., 2013. A History of Territories, Movements and Borders: Politics of Inhabitation. *Architectural Design,* 83(4), pp. 32-37.
Malavasi, R. & Farina, A., 2013. Neighbours' talk: interspecific choruses among songbirds. *Bioacoustics,* 22(1), pp. 33-48.
Mangelsdorf, W., 2013. Metasystems of Urban Flow: Buro Happold's Collaborations in the Generation of New Urban Ecologies. *Architectural Design,* 83(4), pp. 94-99.
Marshall, S., 2005. *Streets and Patterns*. London and New York: Spon Press.
Mills, G., 2008. Luke Howard and The Climate of London. *Weather,* 63(6), pp. 153-157.
Møller, A. P., 2010. When climate change affects where bird sing. *Behavioral Ecology,* 22(1), pp. 212-217.
Moreno, C. D. & Grinda, E. G., 2013. Third Natures: Incubators of Public Space. *Architectural Design,* 83(4), pp. 46-55.
Morton, E. S., 1975. Ecological sources of selection on avian sounds. *The American Naturalist,* 109(965), pp. 17-34.
Narahara, T., 2013. Computer as a Tool for Creative Adaptation: Biologically Inspired Simulation for Architecture and Urban Design. *Computation for Humanity: Information Technology to Advance Society,* p. 69.
Pijanowski, B. C. & Farina, a. A., 2011. Introduction to the special issue on soundscape ecology. *Landscape Ecology,* 26(9), pp. 1209-1211.
Pijanowski, B. C. et al., 2011. Soundscape ecology: the science of sound in the landscape. *BioScience,* 61(3), pp. 203-216.
Raimbault, M. & Dubois, D., 2005. Urban soundscapes: Experiences and knowledge. *Cities,* 22(5), pp. 339-350.
RIBA Competitions, 2013. *Vauxhall: The Missing Link*. [Online]
Available at: http://www.ribacompetitions.com/vauxhallthemissinglink/
[Accessed 2013].
Sarkisian, M. & Shook, D., 2014. *Structural Innovations Inspired by Growth, Genetics, and Emergence Theory*. s.l., International Association for Bridge and Structural Engineering.
Sarvani, V. & Kontovourkis, O., 2013. Parametric Design of a High-Rise Habitation Unit System through Lighting and Solar Energy Performances. *Journal of Sustainable Architecture and Civil Engineering ,* 3(4), pp. 9-18.
Scarre, C. & Lawson, G., 2006. *Archaeoacoustics*. s.l.:McDonald Inst of Archeological.
Schafer, R. M., 1977/1993. *The Soundscape: Our sonic environment and the tuning of the world*. Rochester, Vermont: Destiny Books.
Stanley, M., 2002. *Kennington & Vauxhall:- History*. [Online]
Available at: http://www.vauxhallandkennington.org.uk/history.shtml
[Accessed 2014].
Steadman, P., 2008. *The Evolution of Designs: Biological Analogy in Architecture and the Applied Arts*. New York: Routledge.
Stewart, I. D., 2013. Local climates of the city. *Architectural Design,* 83(4), pp. 100-105.

Stewart, I. & Oke, T. R., 2009. "*Newly developed "thermal climate zones" for defining and measuring urban heat island magnitude in the canopy layer*. Phoenix, AZ, s.n.
Sueur, J. & Farina, A., 2015. Ecoacoustics: the ecological investigation and interpretation of environmental sound. *Biosemiotics,* 8(3), pp. 493-502.
Sueur, J. & Sanborn, A. F., 2003. Ambient temperature and sound power of cicada calling songs (Hemiptera: Cicadidae: Tibicina). *Physiological entomology,* 28(4), pp. 34-343.
Tamke, M. et al., 2012. Design Environments for Material Performance. In: *Computational Design Modelling*. Berlin: Springer Berlin Heidelberg, pp. 309-318.
Truax, B., 2001. *Acoustic Communication*. Westport: Ablex Publishing.
Valverde, S. & Solé, R. V., 2013. Networks and the City. *Architectural Design,* 83(4), pp. 112-119.
Wallschläger, D., 1980. Correlation of song frequency and body weight in passerine bird. *Cellular and Molecular Life Sciences,* 36(4), p. 412.
Weinstock, M., 2010a. *The Architecture of Emergence: The Evolution of Form in Nature and Civilisation*. London, UK: Wiley.
Weinstock, M., 2010b. Emergence and the forms of cities. *Architectural Design,* Volume 80, pp. 118-121.
Weinstock, M., 2011. The Metabolism of the City - The Mathematics of Networks and Urban Surfaces. *Architectural Design,* Volume 81, pp. 102-107.
Weinstock, M., 2013a. System city: Infrastructure and the space of flows. *Architectural Design,* Volume 83, pp. 14-23.
Weinstock, M., 2013b. The evolutionary dynamics of sentience in cities. *Architectural Design,* Volume 83, pp. 92-97.
Weinstock, M. & Gharleghi, M., 2013. Intelligent cities and the taxonomy of cognitive scales. *Architectural Design,* Volume 83, pp. 56-65.
Young, L. & Davies, K., 2013. A Distributed Ground: The Unknown Fields Division. *Architectural Design,* 83(4), pp. 38-45.
Yu, S., Austern, G., Jirathiyut, T. & Moral, M., 2014. Climatic Formations: Evolutionary Dynamics of Urban Morphologies. *Journal of Asian Architecture and Building Engineering,* 13(2), pp. 317-324.

Bio

Merate Barakat is an architect, and is currently an Associate Instructor at the School of Architecture, University of Utah, and Director of the AA Alexandria Visiting School. She holds licences for both North America and the Middle East, has worked on a number of projects that have received design AIA (American Institute of Architects) Awards and also holds a degree in Computer Science and Information Technology. Her current research focuses on the potential for creating a tool that integrates theoretical spatial and soundscape design connections to aid spatial designers.

Michael Weinstock is an Architect, Director of Research and Development, and Director of the Emergent Technologies and Design programme in the Graduate School of the Architectural Association School of Architecture, London. His published work involves research into the dynamics, forms and energy transactions of natural systems, and the application of mathematics and processes of emergence to cities, to buildings and groups of buildings. His work has made a significant contribution to the theoretical

discourses and pedagogies of architecture and raised awareness and understanding of the historical and current impacts of complexity, natural systems, and climatic and ecological changes in human architectures.

Audible Everyday Practices as Listening Education

By Nicola Di Croce

Abstract

How might the recognition of sonic awareness (and its subsequent development) affect and inform the public policy design? It is assumed that the lack of sonic awareness possessed by the citizens who constitute communities currently affects the knowledge controlled by the main stakeholders who establish the guidelines that determine the experience of sonic environment. By exploring the intersection between sound studies and public policy design we believe it is possible to reveal how audible everyday practices might help us to explore otherwise intractable urban issues and enhance the role played by citizens' acoustic awareness within the design of contemporary cities. This investigation allows the design of alternative maps of city uses, abuses and conflicts, and could help to identify the decline of specific traditional knowledges. Furthermore, audible everyday practices could enact listening education, making collectivities realise their responsibilities in the composition of sonic environment.

Keywords

Public policies; design; listening education; sonic environment; sonic awareness; everyday practices; sound culture

1 – FROM INTANGIBLE CULTURAL HERITAGE TO (THE LINK BETWEEN) SONIC STUDIES AND PUBLIC POLICIES

> "Safeguarding intangible cultural heritage is about the transfer of knowledge, skills and meaning. It focuses on the processes involved in transmitting or communicating these elements from generation to generation, rather than on the production of their concrete manifestations, such as dance performances, songs, musical instruments or crafts. *The communities which have and practise intangible cultural heritage are the people best placed to identify and safeguard it. However, outsiders can help with its safeguarding*. For instance, they can support communities in collecting and recording information regarding elements of their intangible cultural heritage, or transmit knowledge about the intangible cultural heritage through more formal channels such as education in schools, colleges and universities." (UNESCO S/A, Questions and Answers, 3. My italics)

UNESCO refers to intangible cultural heritage as the production of the awareness of citizens and communities who recognise themselves within certain elements of their culture, and who are encouraged to safeguard or transform those elements. The logic of this perspective is that without a prior identification derived from the public itself, no one else can define what is, and what is not, a cultural heritage. According to the position adopted by UNESCO and its subsequent interpretation, considering a peculiar sonic environment as heritage becomes a problematic operation unless there is palpable evidence that it is has been inter-subjectively identified as such. That is to say that the

primarily "unconscious" way that soundscapes are typically experienced by citizens does not generate the attentive, sentient perception – that I am calling awareness – which is necessary for identification and its corollary of preservation. Therefore the different levels of awareness (including a potential lack of awareness), forms of representation, and attributions of value, shape an under determination of the sonic environment in terms of citizen consciousness, and render it vulnerable to being "composed" instead by external stakeholders. If we wish to adopt the UNESCO definition of intangible cultural heritage – and it is a definition which comes with a certain symbolic legitimacy – then its implementation depends upon the instantiation of a shared inter-subjective acknowledgment of the intangible elements which actually shape our everyday environment. It is at this juncture that it becomes important to explore the relationship between sonic studies and public policy design as the place from which to achieve – from our "point of view" – a better understanding of particular urban issues.

If policy design could be read as the instrument used by the political sphere to attempt a social and spatial transformation then, by extension, the process of "regulation" can be understood as the efforts to control the effects that policies have on the system of everyday practices carried out by collectivities and individuals. It is our contention that by analysing everyday practices from an acoustic perspective we might develop a new way of explaining urban issues which would otherwise remain "inaudible" to the polity. This paper aims to show how the sonic environment and public policies are interdependent, and how listening could effectively become a design tool if integrated with policy design and with the development of an acoustically-informed public.

To a large extent, by shifting the analytical scale to that of the policy design level of understanding we can reveal some of the regulatory guidelines that frame the experience of the acoustic environment. It is important to listen beyond an exclusive focus on the quantitative regulation enshrined in noise pollution policies (however important these may be) and draw into the analysis such devices as the licences issued by a municipality to various traders as qualitative regulation: both effectively shape the soundscape of a neighbourhood and determine its temporal variations. Thinking about the control of the sonic environment in this expanded way involves acknowledging wider forms of regulation that may indirectly affect the frequency and amplitude of sonic events such as restrictions on traffic flow, land use zoning, limitations on the operating hours of transport systems, entertainment and leisure venues.

> "If sound is understood not only as a phenomenological instrument but also as a communicative tool, the concrete integration of the acoustic in the urban development can be as interesting as the capability of sound to explicitly point out certain situations and conditions, to expand or to manipulate perceptual spaces. […] This expanded discussion reinforces the potential of the spatial and communicative properties of sound as a tool and means of urban practice." (Pagels; Stabenow; 2008, in Tuned City; pp 97-98)

Beneath the quantitative and qualitative regulations – those directed explicitly towards the control of sound and those which exert an indirect control – there remains a system of habits performed by inhabitants who can be understood as either conforming to or

"resisting" the policy decisions supposedly taken on their behalf. These performed habits might well be what is constituted by the traditional everyday practices and peculiar ways of making use of public space. As an example, by listening to a Mediterranean city marketplace we could easily reveal how the street cries performed by traders to better sell their goods establish an extraordinary sonic atmosphere. This everyday practice manifesting through the sellers' voices effectively produces the acoustic ambiance of these places.

> "Yet less attention has been paid to another range of tactic operations, namely the practises of sound making. Like pedestrian acts, sonic utterances perform a double operation of adapting to and transforming the environment. Football fans, vendors and rioters all know the importance of being audible. Indeed, sound making is a powerful means to demonstrate presence and take possession of urban space during concerts, sport events or late at night in the city." (Kreutzfeldt, 2012; p 62)

Returning to my earlier account of intangible cultural heritage, even though we may rue the fact that the once everyday practice of vocalising street traders is fading from acoustic prominence, since there is currently no shared inter-subjective acknowledgment of their relevance in composing the traditional soundscape of the inner city (Said, 2015), we cannot consider street cries in a Mediterranean city as a cultural heritage to be preserved – at least in the terms established by UNESCO. Sounds studies and its methodologies might equip us with the resources to locate the value that might be apportioned to the disappearing cries and singing cues carried on by street traders; by drawing upon public policy design, we might be able to understand their disappearance as an urban issue to which the implementation of specific urban policies might be the response. Once the disappearing street cries are comprehended in this way, a dynamic matrix of policies and issues are revealed as potentially active contributors to their demise: housing policies, licence policies as well as issues of depopulation and gentrification would be certainly become candidates for being taken into consideration and hopefully reframed from a policy design point of view. As identified earlier, the institutional perspective is only one dimension since identifying street cries as an intangible heritage would have to involve a community first identifying the importance of traders' vocalisations and secondly engaging in strategies of preservation of this daily practice. Thus informal actions from below – Kreutzfeldt's "tactic operations" – as well as institutional initiatives from above may both originate from the same recognition of an urban issue revealed through acoustic awareness. This example shows what could be the political potential of sound studies in revealing a certain kind of audible urban issue, and how such an analysis could potentially reframe both the public and institutional understanding.

2 – FROM AUDIBLE EVERYDAY PRACTICES TO SONIC AWARENESS

As the listening stage is essential for the development of sonic awareness, how to proceed from the listening practice to a sonic awareness?

If we assume that a social environment is the product of a complex mesh of everyday practices and routines (Crosta, 2010); and if we consider public policy design as the institutional instrument created to regulate this system of habits, we could read then – and possibly uncover – the audible dimension of specific everyday practices.
Everyday practices deal with cultural representations, traditional expressions, local knowledge which individuals and collectivities identify as their daily social and spatial belongings. Since some such practices strongly manifest themselves through sound, they become – consciously or unconsciously – a pervading contributor to the sonic environment. As Brandon LaBelle understands this phenomenon, "an auditory paradigm is tacitly embedded within the contemporary condition and offers a compelling structure for elaborating what is already in play". (LaBelle, 2010 intr. xviii) Following this argument through, if audible everyday practices can be properly defined as the ways that collectivities make use of public space, then listening to them will enable the policies which contribute to the composition of the sonic environment to be revealed.

The listening practice can propose interpretations and causal connections between the sonic environment and self-identity, and can ultimately develop the capability to investigate the logic of power from a wider sensory horizon than that permitted by any purely visual approach. Thus, listening practice turns into a representational and self-representational tool which could directly stimulate the transformation of the field of relations that governs practices, policies, people and perceptions: the environment.
Nevertheless, the development of an expanded and attentive listening practice can enhance our ability to uncover the hidden sonic traces, which are scattered throughout public spaces. It allows us to additionally grasp the sonic cues – i.e. the hidden sonic traces such as the street traders' cries – which are disappearing behind urban transformations.

By exploring the intersection between sound studies and public policy design we can reveal how the development of sonic awareness could shift both poetically and politically the government and of course the governmentality (Foucault, 1986) of contemporary territories. The development of sonic awareness could also promote a sense of empowerment, energised by a radical impulse to self government: by inculcating listening practices that contribute to a sonic awareness, in particular: environmental, milieu and landscape listening. As citizen becomes involved in making acoustic sense of their environment; the apparently intractable urban issues are no longer passively absorbed and instead there is the possibility for an active participation in their identification and evaluation. Such intractable issues – like the dying out of the tradition of street cries – should be faced through a more sensitive institutional understanding; a sonically aware public should primarily inform this.
The fostering of listening maturity, the safeguarding of everyday practices, the identification of cultural heritages; all these are the desirable outcomes of sonic awareness. Just as sonic awareness depends upon the prior attainment of listening practices, once sonic awareness has soaked into collectivities a further step could be taken with the establishment of sonic communities. The definition of "acoustic community" introduced by Barry Truax contributes significantly to this step:

> "[…] acoustic community means that acoustic cues and signals constantly keep the community in touch with what is going on from day to day within it. Such a system is "information rich" in terms of sound, and therefore sound plays a significant role in defining the community spatially, temporally in terms of daily and seasonal cycles, as well as socially and culturally in terms of shared activities, rituals and dominant institutions. The community is linked and defined by its sounds." (Truax, 1984; p 58)

Given these assumptions, sonic communities would be gathered by groups of sonically aware citizens who share a perspective about how to deal with "sonic commons" far beyond a passive acceptance of the status quo.

We can find assistance in shifting our focus on the notion of sonic awareness from the individual to the collective – and, in parallel, draw out a definition of "identity" – through deploying an expression formulated by Bruce Odland and Sam Auinger (who operate as the artistic project O+A): the "sonic common". For them, the "sonic common" equates to "any space where people share an acoustic environment and can hear the result of each other's activities, both intentional and unintentional." (Auinger & Odland, 2009; p 64) From O+A's perspective the responsibility for sonic environments – whether conscious ("intentional") or unconscious ("unintentional") – resides with citizens who create and simultaneously accept the status quo, understood as a combination of desirable and undesirable sounds from the everyday life. The current sonic environment, experienced everyday by individuals, is indeed the result of all the compromises – as well as the general agreements – accepted by a society in order to carry on their social life. This notion of the sonic commons may encourage the recontexualisation of problems related to the different uses of public spaces, especially through reframing those conflicts which emerge from the overlapping of everyday practices. (Pecqueux, 2013)

Since sonic awareness has to deal also with a "common" sense of the place, it is important to move beyond O + A's "intentional and unintentional" sonic common to an acknowledged and shared sonic common which reflects the inter-subjective level of understanding that I previously identified as being proposed by UNESCO's approach to intangible cultural heritage. My argument is that the creation of this acknowledged and shared sonic common necessarily depends upon the prior development of sonic awareness. Understood from this perspective, we can now appreciate that sonic awareness is an ability that emerges through its exercise: it is an incisive skill for uncovering the ephemeral and powerful codes hidden within sonic environment. Thus we could say that sonic awareness and intangible cultural heritage require the realisation of the potentials embedded in listening practices, potentials that, in this case, are directed towards the invisible system of connections between inhabitants and their environment.

In the light of these considerations we can say that taking care of audible everyday practices represents an excellent opportunity to establish a dialogue between sonic studies and participatory, as well as policy, design. Sonic awareness would involve citizens and collectivities making use of sonic knowledge as a device for monitoring the quality of public space: this is how listening might become a policy design tool.

3 – FROM LISTENING TO MANAGING THE SONIC ENVIRONMENT

Since, as I have argued, sonic awareness has been located at a critical juncture, it is important to clarify how it relates to the role played by the multiplicity of listeners. In fact, as every listener has his own sonic world, we should not aim for an absolute definition of sonic heritage, rather we should examine in depth the relations that individuals establish with the sonic environment. From the extended research "European Acoustic Heritage" (Kytö, Remy, Uimonen, 2012) and from the essential studies of Pascal Amphoux it is possible to arrive at a classification of the three main listening modalities:

- *Environmental listening*: which concerns the acoustic qualities of a space, i.e. a sonic order that is objective, accessible and controllable.
- *Milieu listening*, concerning the sonic comfort, i.e. a sonic order that is amalgamated, natural and vivid, and which arises from the structure of a place and people's activity.
- *Landscape listening* (soundscape) concerns the perceived quality of sound, i.e. a sonic dimension that evokes aesthetic and sensitive responses to sounds. (Amphoux, 2012; Hellström, 2011)

In brief, the physical sound signals, the perceived and the representative dimensions of sound, are all part of our sonic experience. As the first deals with quantitative measurements, the other two are open to subjective and cultural interpretations and would thus represent the main focus of any inquiry into acoustic heritage. Milieu listening and landscape listening are, indeed, a powerful "bridge" to access the relation between inhabitants and sonic identity (Senesi, 2010). This is because the notions of milieu and landscape listening are dealing with a qualitative understanding of sonic environment, therefore they could effectively support institutional attempts to limit urban noise through acoustic zoning, by introducing a "soundscape approach".
In other words, a soundscape approach should effectively implement a noise control approach by proposing to politicians, policy makers and acoustic designers, soundscape planning as a new tool for the management of the acoustic environment (Lex Brown, 2012).

Since we are not seeking noise control policies to mask "unwanted sounds" but rather orientating our efforts to ensure that "unwanted sound" does not mask "wanted" sound, we can listen to daily practices as the traces through which to read urban dynamics and recognize the vitality, or indeed the debility, of specific uses of public space. It is in this context that we recall Amphoux's listening modalities which each generate a corresponding "action attitude":

– *Diagnosis of the environment*:
This is a defensive attitude and consists of protecting the sonic environment from acoustic pollution; to normalize, to regulate, to control, to build noise barriers, to divert cars streams, to reduce traffic.
– *Managing the milieu*:

This is an offensive attitude since it aims at consolidating the sonic milieu, i.e. strengthening the amalgamated and vivid dimension of a certain place, but also informing the inhabitants about sonic comfort.
– *Creation of the landscape (soundscape)*:
This is a creative attitude, in the sense that it consists of composing the land-soundscape. Urban sonic sound designers (similar to a lighting designer) can manage this task but it is necessary to promote such operations to stimulate consciousness of the acoustic space and to develop greater public awareness (European Acoustic Heritage, 2012; Amphoux 2012).

These criteria disclose how it is only through a developed sonic awareness that the tripartite appreciation of the environment can be derived: its diagnosis, its management and its creative composition. My ambition is the investigation of the dynamic – and, of course, the audible relationship – between policies and collectivities; which is to say the examination of how everyday practices basically shape the sonic environment; and how sonic awareness could intervene to shape public policies. Since acoustic traces are constantly embedded in urban dynamics, adopting the proposed approach has the potential to finally fulfil the aspirations that Amphoux calls managing the milieu and creating the landscape. Simultaneously – as a prior condition – a shared understanding of the sonic environment within public spaces could emerge. I am convinced that sonic studies could effectively establish a durable dialogue with public policy design; encouraging the empowerment of communities for the fulfilment of the ability to self government.

4 – FROM SOUND EDUCATION TO PARTICIPATORY PRACTICES

If we argue that sonic awareness can effectively develop a collective empowerment, then one question that follows asks how can such awareness be stimulated? One factor that offers itself as a potential stimulant is that of "sound education" and its introduction as an innovative device across the different scales of institutional, individual and public. Where a demand for an inquiry into the sound cues that reverberate the urban contemporary is urgently required for a policy level of understanding (so that resources can be provided) then a sound education would provide this. The process of sound education becomes essential both for citizens and institutions and it may be that previous successful projects involving artistic practitioners catalysing communities and institutions can inspire future efforts (Flügge, 2014).

In shifting from music education to sound education – and finally to sonic education – we could better understand the role played by everyday sonic experience in developing a participatory attitude within collectivities. There is already a pedagogy of listening informed by music education which could be adapted to listening practices in order to turn the aesthetic experience of the everyday life sounds into a more participatory process. (Tinkle, 2015) Sound education becomes then the tool to uncover sonic identity and sonic heritage by developing sonic awareness within citizens and communities. Listening is transformed into a device for empowerment while the safeguarding of an everyday practice may act both on a social and a sonic level of understanding. A sound pedagogy without real sound pedagogues – whether from the artistic, the academic or

the institutional field – is in fact the target of many participatory projects which give "priority to transforming auditory perception" (Ultra-red, 2012; p 2)

To this end artistic collectives like Ultra-Red have developed – through what they define as a militant sound practice – extremely interesting research into sonic space and social repercussions. Through their many projects they have analysed the political conflicts that are reflected in the sonic environment, proposing a participatory sound research strategy created for enhancing a debate within local communities on themes like marginality, education and housing policies, as well as gender and discrimination issues within public space. Methodological experimentation is crucial; participation is indeed the constant process of a collectivity which comes to self-awareness through its engagement with the sonic environment as a tool for social and urban knowledge (Ultra-red, 2014).
This sensorial reframing can now become a useful strategy for a political level of understanding, by shifting from finding who has the right to educate, to the process of listening itself, to a participatory process of mutual and self-teaching. Sonic identity is involved here in the creation of a sonic aware public that becomes able to recognize audible everyday practices as identifying elements of a peculiar sonic environment. However, the paradox of education must be acknowledged in this. On the one hand, there is the positive step in giving a community the tools which will allow them to identify and safeguard a cultural sonic element. On the other hand, any mediated process is affected by the logic of asymmetrical "power". Such a risk particularly involves marginal stakeholders who do not have the tools to self-represent themselves; or who are simply unconscious of the attachment of peculiar elements of sonic environment. In this context, one of my first objectives would involve working together with those coming from different social backgrounds in order to build up a shared sonic awareness (while remaining conscious of the risk of asymmetries). Sound could become then a vehicle to regenerate the sense of the place, which is often disappearing within contemporary contexts. Moreover it could re-humanize public space by determining its contents starting from its inhabitants (Balay, 2004), and restore the sense of belonging, not as a product of an exclusionary racism, but rather as a close connection between territory and community.

5 – FROM PARTICIPATION TO MAPPING (AND BACK AGAIN)

How has participation already been approached through sound, and what are the outputs that it has been able to achieve?

By defining the role of an urban acoustic planner, the artist Sven Anderson was able to simultaneously challenge and provoke an institution by working from the inside of the Dublin municipal government; in the process Anderson began a long dialogue around the possible outputs that an urban sound art project could achieve. From the context of Anderson's activities, the urban acoustic planner can become active in impelling a municipal government organisation to reframe the debate on urban issues through emphasising a sonic perspective; his work shows how the urban acoustic planner can propose real interventions, which can be manifest concretely as permanent installation projects. The artist – as a composer, as Murray Schafer might have said – thus adopts a political role; he or she becomes involved in the representation of a community or of a

specific issue and could effectively stimulate public debate (Anderson, 2014). Even though the process through which this is achieved may not exactly be considered participatory within the threshold of symmetrical community proposed above. On another scale, and pursuing a different aim, Peter Cusack's "Favourite Sounds" project (another artist's invention / intervention) stresses the personal system of values through which each citizen approaches the sonic environment they encounter in their everyday. Instead of asking "Which are the sounds that you most dislike within your environment?" the focus on the "favourite sound" revealed a surprising level of awareness to their urban soundscape. By collecting all the answers Cusack is able to draw an identity map which shows slightly different perceptions as the project shifts its geographical locus from one city to the next, from London to Manchester, Beijing, Prague, Berlin, Chicago and onwards (Maag, 2013). Cusack's is a sensitive attempt to represent personal feelings and build through them a collection of sensations which reflect everyday practices and through this reflection offers an opportunity to inform further urban development. Deployed in such a way, sound mapping is raised to a methodology capable of instigating an interaction – albeit a virtual one – that might support the creation of a public around a specific sonic knowledge.

> "The social dimension of sound mapping – whether through online interactions, or through in-person interactions with artists, designers, or other contributors in the context of listening walks, collective recording sessions, participative artworks, and so on – provides a basis for integrating sound mapping into various kinds of shared experiences of city life" (Ouzonian, 2014, in The Acoustic City; p 168).

In 2009 the architect Antonella Radicchi developed a sound map for the city of Florence. The map has grown year by year thanks to the contribution of many citizens and has since become incorporated as part of the Open Data of the municipality (Radicchi, 2012). This example shows the institutional acknowledgement of a "virtual" community, which moves through a collaborative map, towards a certain kind of sonic awareness. From these premises such a community could then work towards the safeguarding of a peculiar sonic environment that has been revealed through the collaborative cartography; in this instance, however, this next step is yet to come. The recent spreading of sound maps confirms how they are indeed useful tools, but if their outputs are analysed closely, they also debunk the myth of the democratization of knowledge since only those who chose to participate attain the responsibility of decision (and there remains the question of the cartographer themselves and the asymmetry that they, like the sound pedagogue of the earlier examples, risk retaining). Such a logic, apparently coherent with UNESCO's position on intangible cultural heritage, again disadvantages marginal stakeholders – who do not yet have the tools to intervene in a public debate – and this needs to be addressed.

> "The soundscape composer and theorist Jacqueline Waldock has also questioned whether sound maps are able to effectively realize their aims, and reminds us of the hierarchies, fractures, and divisions that can arise even when a project is

> well-intentioned. Waldock reiterates my question of unequal access when she demands 'will [sound] maps exclude the sounding words of those who cannot afford smart phones? And: have the makers taken into account the recording culture and norms that are produced and reiterated by these maps?' In term of the latter question, Waldock is especially concerned that sound maps reproduce dominant divisions of "gender, domestic and public, private and collective, poor and well-resourced". (Ouzonian, 2014,The Acoustic City; p 171 op cit. Waldock, 2011)

Participatory maps, have attempted since their inception to overcome the risk of asymmetry that I have been identifying.
From agricultural development to the recognition of communities' rights to access, control, and use basic resources such as water or forests, the aim is indeed to let a map become an empowerment tool for marginal stakeholders, following political and strategic processes
where there are few other chances to confront delicate issues. Public engagement then becomes necessary and requires an unexplored way of archiving different media and data. It is my contention that sound mapping can derive inspiration from the strategic lessons of participatory mapping and incorporate its methods in order to prevent the social exclusion identified by Waldock amongst others.

> "Participatory mapping – also called community-based mapping – is a general term used to define a set of approaches and techniques that combines the tools of modern cartography with participatory methods to represent the spatial knowledge of local communities. It is based on the premise that local inhabitants possess expert knowledge of their local environments which can be expressed in a geographical framework which is easily understandable and universally recognised. Participatory maps often represent a socially or culturally distinct understanding of landscape and include information that is excluded from mainstream or official maps. Maps created by local communities represent the place in which they live, showing those elements that communities themselves perceive as important such as customary land boundaries, traditional natural resource management practices, sacred areas, and so on." (Mapping for rights)

This paper argues that there is a need to adapt or alter the conventional approach to sound mapping, while recognising that their purpose, to allow researchers access to otherwise inaccessible soundscapes, is important. What is missing is a method or protocol that allows for a translation of sonic events into urban design strategies, which will shape public policy. Further, this paper advances that the ideas proposed by Auyogard and Torgue (2006) of unmasking auditory events within the social, architectural, physical etc., be utilised through a more collectively engaged approach to design. What is needed is the promotion of a design aptitude: shifting from production of an inert archive to an active process where each significant node becomes the focus for exchange of comments and discussion; moving from the sound map towards a collection of concrete propositions.

A repertoire of innovative sonic methodologies have been scoped out in this paper – such as listening practices, sonic education, the sonic commons, the urban acoustic planner, sound maps – and this array of strategies can provoke sonic awareness. Amplifying these methodologies can go hand-in-hand with a stimulation of a public debate over the sonic environment but what remains ultimately necessary, from my perspective, is to transform awareness into tactical propositions; to connect, in effect, the work of sound studies with action-oriented public policy design. Only by developing these propositions can the dynamics of fragile urban issues revealed through sound enter into logics of the institution. On the one hand, policy-making could be implemented by an institutional acknowledgment on sonic environment – that is to say on audible everyday practices. On the other hand, self-government can only be achieved by an aware public.

References

Amphoux, P. (1992) À l'ècoute du paysage. Paysage et crise de la lisibilitè. Lausanne, Universitè de Lausanne, Intitut de Gèographie

Anderson, Sven (2014). *From Noise Control to Urban Acoustic Design: Exploring Civic Responses to an Activated Urban Soundscape*. Paper presented at the *Recomposing the City: Sound Art and Urban* Architectures Symposium, Belfast.

Attali, J. (1984) *Noise: The political economy of music*, University of Minnesota Press (US)

Augoyard, J. F. & Torgue, H. (2006) *Sonic Experience: a Guide to Everyday Sounds*. translated by Andra McCartney and David Paquette, Montreal: McGill-Queen's UP.

Auinger, S. & Odland, B. (2009) *Reflections on the Sonic Commons,* on Leonardo Music Journal, Vol. 19, pp. 63–68, MIT Press. Online at: <http://www.bruceodland.net/pdfs/LEOMJ19_pp063-068.pdf> (Last view: 15/2/2015)

Baläy, O. (2004) *Discrete mapping of urban soundscapes*. Soundscape (The journal of acoustic ecology : WFAE), 2004, n 1, pp 13-14

Barthes, R. (1991). Translated by Richard Howard. 'Listening' *The Responsibility of Forms: Critical Essays on Music, Art and Representation*. University of California Press, Berkeley.

Blesser, B; Salter, L. (2007). *Spaces speak, are you listening? Experiencing aural architecture*. MIT Press Cambridge, London.

Crosta P. L. (2010) *Pratiche. Il territorio "è l'uso che se ne fa"*, Franco Angeli, Milano.

Dewey J, (1971) *Comunità e potere*, La nuova Italia editore, Venezia.

EU Noise Policies <http://ec.europa.eu/environment/noise/index_en.htm>

Flügge, E. (2014) *Sonic Thinking. How Sound-art practices Teach Us Critical Listening to Space*. Invisible Places 18–20JULY 2014, Viseu, Portugal

Foucault, M (1986). *Disciplinary Power and Subjection*. New York University Press

Gandy, M; BJ Nilsen (2014) *The acoustic City*, Gandy, Nilsen Editor

Hellström, B. (2011) The Sonic Identity of European Cities. A presentation of the work conducted by the Swiss-French researcher Pascal Amphoux. Online at: <http://europeanacousticheritage.eu> (Last view: 20/3/2015).

Kreutzfeldt, J. (2012) *Street cries and the urban refrain. A methodological investigation of street cries*. In: Sound Effects vol. 2, n. 1, (pp. 61-80)

Kleinen, D; Kockelkorn, A; Pagels, G; Stabenow, C, (2008) *Tuned city. Zwichen Klang- und baumspecilation. Between Sound and Space speculation*. Kookbooks, Berlin.

Labelle, B. (2010) *Acoustic Territoires / Sound Culture and Everyday Life*. Continuum, New York.

Lex Brown, A. (2012) *A Review of Progress in Soundscapes and an Approach to Soundscape Planning*. In: International Journal of Acoustics and Vibration, Vol. 17, No. 2, 2012

Maag, T. (2013) *Potentials of public sound art – an interview with sound artists Peter Cusack and Sam Auinger*, Excerpt of the master thesis: *Cultivating urban sound. Unknown potentials for urbanism*. On line at: <http://www.cultivatingurbansound.info/?portfolio=peter-cusack-and-sam-auinger> (Last view: 20/3/2015)

Magnaghi A. (2010) *Il progetto locale, verso una coscienza di luogo*, Bollati Boringhieri, Torino.

Mapping for rights. On line at: <http://www.mappingforrights.org/participatory_mapping> (Last view: 3/7/2015)
Kleinen, D; Kockelkorn, A; Pagels, G; Stabenow, C, (2008) *Tuned city. Zwichen Klang- und*
baumspecilation. Between Sound and Space speculation. Kookbooks, Berlin.
Kytö, M; Remy, N & Uimonen, H (2012) *European Acoustic Heritage,* Tampere University of Applied Sciences (TAMK) & Grenoble: CRESSON Publishers.
Pecqueux, A. (2013) *Tempesta sonora o fuoco di campo sonoro: Do the Right Thing, interazione e ascolto musicale (in) pubblico*, in Studi Culturali - ANNO X, N. 1, APRILE 201
Radicchi, A. (2012), Sull'immagine sonora della città, Firenze University Press, Firenze.
Said, N. (2015) *Les crieurs publics: un dispositif sonore dans les quartiers populaires du Caire*, in *Soundspaces : Espaces, expériences et politiques du sonore*. Claire Guiu,
Schafer M. (1977) *The tuning of the world*. Mc Clellandand Steward Limited, Toronto (trad. it. *Il paesaggio sonoro*. Ricordi –LIM, Milano)
Schön D. A. ; Rein M. (1994) *Frame Reflections: Towards the resolution of intractable policy controvercies*, Basic Books, New York.
Senesi, E. (2010) *Sonic Rendezvous: Experiences of Urban Sound Art and Public Encounters in Shared Acoustic Spaces,* Master Digital Media Arts Dissertation, University of Brighton
Tinkle, A. (2015) *Sound pedagogies: Teaching listening since Cage*; in: Organised Sound, 20, pp 222-230 doi:10.1017/ S1355771815000102
Truax, B. (1984) Acoustic communication, Ablex Publishing corporation, Norwood
Ultra-red (2012) *Five Protocols for Organised Listening*; URL: <www.ultrared.org/uploads/2012-Five_Protocols.pdf> (accessed on 2 December 2015).
UNESCO S/A. What is Intangible Cultural Heritage? e-leaflet. Online at: <http://www.unesco.org/culture/ich/doc/src/01851-EN.pdf> (Last view: 8/1/12).
Waldock, J. (2011) *Soundmapping: Critiques and reflections on this new publicly engaging medium,* Journal of Sonic Studies 1/1 (October 2011). Online at <http://journal.sonicstudies.org/vol01/nr01/a08> (Last view: 26/6/2015)

Bio

Nicola Di Croce is an architect, a musician and a PhD in Regional Planning and Public Policies at the University of Venice, with a research on marginal sonic environments and everyday practices. He has been visiting doctoral student both at Recomposing the City Research Center, Belfast Queen's University, and at CRESSON, Grenoble University. He is the curator of the Italian Soundscape Archive collective (Archivio Italiano Paesaggi Sonori) and an active researcher within sonic studies and planning fields. His most recent publication is the essay "Geografie sonore", published on Linaria Edizioni, Rome 2016.

Phenomenology, Technology and Arts Education: Exploring the Pedagogical Possibilities of Two Multimedia Arts Inquiry Projects

By Dylan van der Schyff

Abstract

The relevance of phenomenology for arts education is explored through two multimedia arts inquiry projects. I begin by offering a brief outline of what arts inquiry and phenomenology entail. Following this, I consider a phenomenological study relevant to creative multimedia studies, and develop the relationship between phenomenology, critical pedagogy, and creative praxis in the arts. Drawing on these ideas, I then discuss the processes involved in creating the multimedia projects and consider possibilities for similar projects in educational contexts. Most importantly, I attempt to show how such projects might open arts educators and students to more reflective, imaginative and participatory ways of being-in-the-world, while simultaneously developing deeper historical, cultural, technical, and aesthetic understandings of the art forms they are engaged with.

Keywords

arts education, phenomenology, critical pedagogy, arts inquiry, creative multimedia

Introduction

The field of arts-based research involves examining the process of creative practice (often from the first-person perspective) to gain better understandings of a range of concerns that impact human well-being (Barone & Eisner, 2012; Knowles & Cole, 2008; Leavy, 2015). In pedagogical settings, such forms of inquiry may be developed in collaboration with students as a way of helping them engage critically and aesthetically with the worlds they inhabit (Bresler, 2007). At its best, arts inquiry for education does not focus on adhering to a fixed set of practices and outcomes – a curriculum for "everyone everywhere" (Noddings, 1995, 31) – but rather strives to foster an understanding of arts education as a critical and transformational process of self and world-making. Increasingly, arts-based inquiry develops alongside the growing field of research and theory that explores the applications of technology for music and arts education. Indeed, there now exists an impressive range of literature that examines multimedia technology at the intersection of pedagogy and creative practice, including the use of iPods, cell phones and other readily available devices and software (Finney & Burnard, 2010; O'Neill & Pesulo, 2013; Simoni, 2013; Slater & Adam, 2012).

In general, the growing use of new digital technologies in music and arts education is seen as a positive development. For example, Burnard (2007) discusses the important roles of technology and creativity for promoting pedagogical change, arguing for an understanding of "creativity as an essential human attribute lying at the heart of all learning," and where technology is understood "as tools that mediate how creative activity occurs" (p. 37). And indeed, a number of recent studies have examined how the

creative use of technology may afford new understandings of the dynamic interaction between sound, image and space (e.g. Wilson & Brown, 2012). This said, some thinkers remain cautious, suggesting that a non-critical celebration of new technologies may contribute to a passive reliance on digital devices, a false sense of one's own creative engagement, and to the commodification and marketization of education (Taylor, 2011; Wishart, 1992). As a result, it is argued that our engagement with technology for education should be subject to on-going critical analysis – that we must remain careful not to let technology simply drive our perceptions and desires, but rather use technology critically and creatively to challenge taken-for-granted attitudes and develop new ways of engaging with the world that are meaningful and relevant to our lives. In line with such concerns, a number of thinkers have begun to develop approaches to arts research, creative technology and education that are based in phenomenology and critical pedagogy (Macedo, 2012).

In what follows, I attempt to contribute to this project through an exploration of two multimedia arts inquiry projects. I begin by offering a basic outline of what phenomenological inquiry entails. Here I examine Ihde's (1976) phenomenology of the 'auditory dimension' as an introductory example that is relevant to creative multimedia studies. Following this, I develop the relationship between phenomenology, critical pedagogy, and creative praxis in the arts. Drawing on the resulting insights, I then present the multimedia projects and discuss the possibilities they offer for developing richer understandings of the creative multi-media process, as well as the pedagogical meaning of art making more generally. Most importantly, I attempt to show how such projects might open arts educators and students to more reflective, imaginative and participatory ways of being-in-the-world, while simultaneously developing deeper historical, cultural, technical, and aesthetic understandings of the art forms they are engaged with. I conclude by suggesting a few additional possibilities for educational praxis and research.

Phenomenology & Arts Education

Phenomenology is a philosophy of experience, of consciousness, perception, knowledge and being. It has antecedents in a range of ancient and modern philosophical traditions. Phenomenology proper, however, is generally understood to begin with the work of the Moravian logician, Edmund Husserl. Writing at the end of the 19th century, Husserl became concerned that the successes of the positive sciences had resulted in a worldview that was increasingly focused on technological progress, thus obscuring "the questions which are decisive for a genuine humanity" (1970, 10). In response to this he sought to re-establish the human element by developing a new 'science', which takes human experience as its explicit basis. Indeed, it should be noted that Husserl's phenomenology was critically motivated – an orientation that continues to characterize the thought of many phenomenologists working today.

Throughout its development in Husserl's writings, and in the work of the many impressive thinkers that followed him (e.g. Heidegger, 1962, 1982; Merleau-Ponty, 2002), the phenomenological approach has been adapted and transformed in various (and sometimes quite radical) ways to explore a wide range of phenomena (Gallagher, 2012). And although many of these inquiries employ difficult theoretical concepts and

complex terminology, the basic approach initiated by Husserl can nevertheless be described fairly clearly. The phenomenological perspective recognises that our conscious experience is always directed towards things and events (including our own bodies, thoughts and imagination). That is, it shows that experience is intentional – it is always the experience of 'something' and that that 'something' is always experienced in a certain way (Gallagher, 2012). The real importance of phenomenology, however, lies in the way it examines the structure of consciousness and intentionality (Ihde, 1976, 1977). Indeed, an important early step taken in phenomenological inquiry involves an attempt to 'suspend' or 'bracket' (epoché) assumptions and judgements and attend to the phenomenon at hand in the most open and direct way possible. Put simply, this process reveals how many of our perceptions and understandings are in fact the products of ways of attending to the world that have become so ingrained that they appear to take on a fixed reality of their own. This results in the development of so-called 'natural attitudes' (Merleau-Ponty, 2002) towards the things, activities and relationships that characterize our lives; attitudes we often simply take-for-granted as the way things are.

Phenomenology examines such assumptions in terms of the processes of historical (personal, cultural) sedimentation that give rise to them so that new understandings and possibilities may be revealed. In doing so, it initiates a process of inquiry into the structure of consciousness that begins with the what (noema) of experience as it appears in the non-reflective context of the natural attitude. The inquirer then attempts to identify and bracket (epoché) assumptions and judgements in order to move from the prescriptive 'literal-mindedness' of the sedimented natural attitude and better attend to the phenomena as it is given directly to experience. This leads to an examination of the how of experience, revealing the modes of experience (noeisis) and the way the shifting interplay of such modes may reveal new understandings and possibilities. The phenomenologist then questions back to the who (I-ego) of experience, disclosing the 'self' as a transforming embodied agent who plays an active role in the on-going construction of experience. Importantly, this process may proceed in an on-going 'circular' way to reveal ever richer (polymorphic) ways of attending to the phenomena at hand.

In brief, while the dominant intellectual trends associated with positivist thinking have emphasised an objectivist approach to experience, phenomenological inquiry affords a rather different story. It reveals experience not in terms of some kind of dualist schema where a fixed or pre-given 'world out there' is represented 'internally' in the mind – an essentially passive cause and response process. Rather, it is explored as a recursive, circular or oscillating phenomenon, where self and world engage in an on-going, relational process of co-constitution. In other words, phenomenological inquiry highlights the active, adaptive, exploratory and creative nature of perception and consciousness. And it shows how through sustained reflective analysis we may build up deeper understandings and open new possibilities. There are, of course, many phenomenological accounts that demonstrate how this is so. For the sake of brevity, however, I consider next just one example that will be relevant to the multi-media projects I discuss further on.

The auditory dimension

In chapter four of Don Ihde's (1976) monograph, *Listening and Voice*, he offers a brief, yet highly illuminating introductory reflection on the experience of sound, which also reveals fundamental insights into vision and the experience of movement. He begins the chapter by asking, "What is it to listen phenomenologically?" His response follows the basic method of inquiry I began to sketch out above.
Ihde starts by identifying and "deconstructing" certain "beliefs" that may intrude into his attempt to listen "to the things themselves" (p.49). In the process he reveals a common tendency to atomize the senses – a tendency that results, for example, in the abstract 'pairing' of sight and sound as two seemingly distinct (comparative) dimensions within experience. With this assumption noted, Ihde initiates an exploration into the modes of visual and auditory experience to develop a richer understanding of how they relate to each other. Initially, Ihde concerns himself with the 'mute' objects that occupy the office where he writes. These consist of mundane things like chairs, tables and a box of paper clips resting on the desk in front of him. But the sudden appearance of a fly in the room introduces a new type of material entity – one that is characterised by movement. Ihde observes that the fly's movement is "etched" against the stability of the room – "if it may speed its way at all it must do so against the ultimate foundation of a stable background" (p. 50). But what, he asks, does this mean for sound? Here he notes that if silence marks the boundary or horizon of sound, then the static mute object (e.g. the box of paper clips) stands "beyond this horizon", while nevertheless remaining "silently present." He also observes that the introduction of movement brings sound with it (e.g. the fly's buzzing and so on). Phenomenologically, sound and movement belong together and thus the experience of sound 'overlaps' with the visual dimension of moving entities.

Developing these insights further – now in the context of space – Ihde describes walking into the Cathedral of Notre-Dame in Paris for the first time. Here he notes the initial experience of space in terms of the monumental visible architecture that defines the cathedral in its (almost) empty state. Ihde then discusses the experience of returning later to attend a high mass. Now the space is filled with people and the sound of singing, "the mute walls echo and re-echo" (p. 51); the space has been brought momentarily back to life, and "the 'paired' regions of sight and sound 'synthesize' in dramatic richness" (p. 51). However, Ihde also notes that even though the descriptions of the office and the cathedral reveal the 'overlapping' and 'synthesis' of the visual and auditory dimensions in movement, space and time, there nevertheless remains an "excess" of sight over sound in the realm of the mute object (the silent walls of the cathedral and the non-moving objects in the office). He then asks, if there is a comparable 'region' where sound exceeds vision, an "area where sight cannot enter, and which, like silence to sound, offers a clue to the horizon of vision" (p. 51).

In response to this question, Ihde then considers the experience of walking along a dark country path, where the visual dimension is severely curtailed. Here he becomes keenly aware of every sound and notes that the darkness renders the presence of sound more dramatic when he cannot see. However, he questions whether darkness can really be considered as marking the boundary of the visual horizon. This is clarified through a meditation on the experience of wind. As Ihde observes, although the wind is heard and

felt, it is not visible directly. Rather, it is only 'seen' in its effects, in "what it has done in passing by" (p. 51). He notes, "I hear its howling and I feel its chill but … no matter how hard I look I cannot see the wind…." The experience of wind extends beyond the horizon of sight. This leads Ihde to suggest that it is invisibility, and not darkness, that characterises the boundary of sight. Indeed, darkness and invisibility are not synonymous; darkness is a characteristic of the visual modality, but sonic experiences of movement, location and space can and do occur without seeing (or being able to see) anything (including darkness). Thus, the activity of "listening makes the invisible present" in a way similar to how looking makes the inaudible 'mute object' present in the visual dimension (p. 51).

Through these observations Ihde is now able to make several summary approximations about the relationship between the auditory and visual dimensions that may advance the abstract pairing of sight and sound mentioned above (pp. 52-54). He suggests that it is now possible to map two 'regions' that overlap, but not perfectly so (see figure 1). Indeed, each region may be understood to maintain its own horizon within which a range of entities may be discerned. In the visual region we find entities that are stable and most often mute (x); and those that are in motion and often "accompanied" by sounds (→y→). This visible region may be understood as bounded by the "horizon of invisibility." Within the auditory region we also find two categories of sound presence, which are bounded by "the horizon of silence." There are those sonic entities that "accompany" moving visual entities (→y→) and those for which no immediate visible presence is found (–z–) – e.g. the kind of entities that characterize 'acousmatic' listening (Chion, 1994). However, as Ihde points out, inasmuch as all sounds are perceived as occurring in time, as "events", they are all likely to be associated with action and thus with the "realm of the verb" (p. 51).

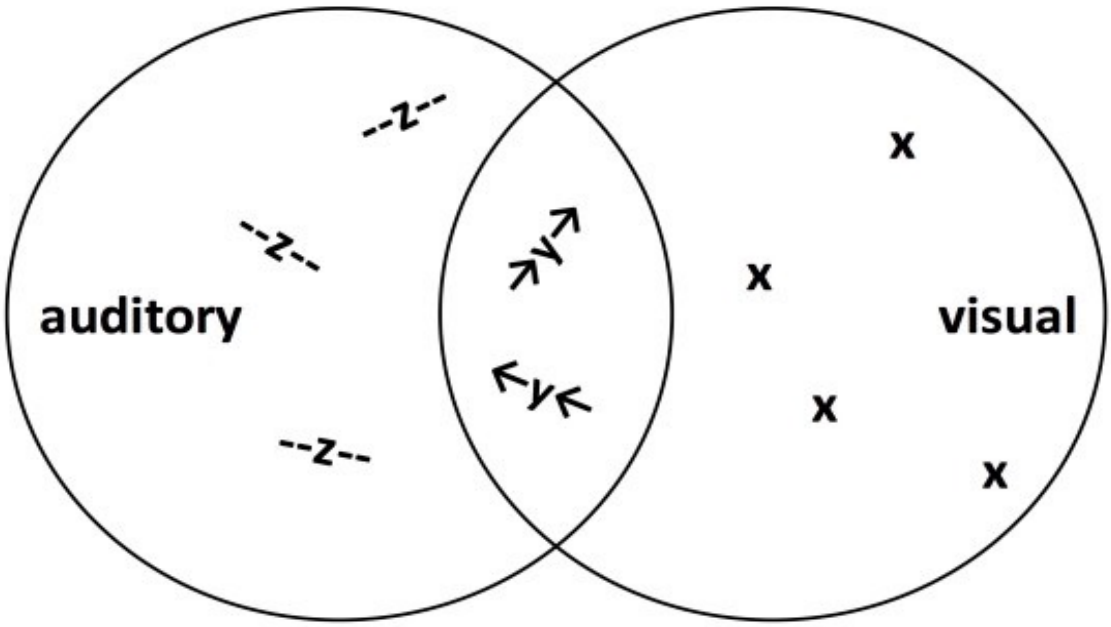


Figure 1. A summary of Ihde's mapping of the auditory and visual regions (1976 p. 52-54)

In brief, this preliminary phenomenological 'mapping' of the auditory and visual dimensions allows us to see that "what is taken as horizontal (or absent) in one 'region' is taken as a presence for the other" (p. 54). Entities of type x that appear in the visual region also lie within the field of silence and are thus 'closed' to auditory experience. Likewise, entities of type –z– emerge in the auditory region, but are not present to the visual dimension. However, presences of category →y→ involve a perceptual "synthesis" of both regions. It is also important to note that the perception of a –z– type entity in the acoustic environment often initiates a search to transform –z– in to →y→ (see also Chion, 1994). Here Ihde uses the example of the bird watcher, who most often hears the bird first and then seeks for it visually – as he writes, "sounds are often thought to be anticipatory cues for ultimate visual fulfilments" (55). Additionally, x type entities may be manipulated in space, thereby momentarily transforming their phenomenological status from mute objects to sounding objects; through experience we come to recognize the sounds of such normally static mute objects when they are put into motion by some external chain of events. Here Ihde brings to mind how one might, while hanging a picture on the wall, know where to search for a dropped tack by the sound it makes as it rolls under the piano (p. 55). Lastly, Ihde notes that through the use of technology the auditory dimension may be explored in a number of new ways. For example, through amplified listening we may experience sonic worlds that were previously silent (e.g. insects). Additionally, various 'hermeneutic' devices afford the 'translation' of sound into the visual dimension, making the invisible visible (e.g. oscilloscopes, sonography, echo-location, radar and sonar, ultra-sound, spectrograms and so on).

Following this chapter, Ihde goes on to explore the 'I' of auditory consciousness. Here he reflects on how his experience and understanding has begun to transform thanks to his analysis, and he develops a range of fascinating new perspectives. But while the

introductory inquiry discussed above provides only a very general approximation of the the auditory and visual dimensions, it nevertheless asks us to begin to attend to experience in new ways. Indeed, even this brief account offers a much more nuanced model of the what and how of experience than we usually entertain in non-reflective day-to-day engagements. And once in possession of such understandings we may begin to develop them both philosophically and aesthetically. That is, we may begin to apply them to a range of phenomena in order to move beyond the taken-for-granted perspectives (fixed, prescriptive, non-reflective) towards a more open, reflective phenomenological attitude – one that actively explores the possibilities of experience, thus opening new ways of engaging with the world. It follows, then, that the fundamental insights offered by an inquiry like Ihde's may have a great deal to offer creative artists working in multimedia contexts, for whom a deep understanding of the relationship between the auditory and visual dimensions is essential.

In my discussion of the multi-media projects below I will develop the insights into the visual and auditory dimensions just discussed, and introduce a number of other relevant phenomenological perspectives. First, however, I would like to outline the significance of phenomenology for education to better ground the pedagogical considerations that follow.

Arts education and the phenomenological attitude

The discussion above offers only a very basic outline of what phenomenological inquiry may entail. Ihde's texts (1974, 1976, 1977) contain many more useful insights. And a number of other authors offer excellent and accessible introductions to phenomenology. Like Ihde, some (Clifton, 1983; Ferrera, 1991; van der Schyff, forthcoming) engage readers in actual phenomenological experiments that involve the exploration of visual and auditory phenomena; others introduce and explain the historical development and uses of phenomenology in various contexts (e.g. Gallagher, 2012; van Manen, 2014). While such texts are essential for anyone wishing to gain a proper understanding of phenomenology, it is beyond the scope of this paper to discuss them in detail. The main point I would like to consider here is the important role the cultivation of a 'phenomenological attitude' may play for education, and, more specifically, for developing practice-based curricula in creative sound and media production.

While examinations of sensory experience, such as Ihde's, are an essential starting place for developing a phenomenological attitude (Merleau-Ponty, 2002), this orientation may take us much further to explore and critically rethink our experience of cultures, places and institutions we live through. With this in mind, it is important to note that the phenomenological perspective challenges a number of standard Western pedagogical assumptions, most centrally, the idea that learning and 'knowledge' can be reduced to the depersonalized transfer of pre-given (objective) information, facts and procedures from teacher to student. Indeed, the phenomenological attitude has influenced the thinking of a number of critical scholars who problematize this assumption (Arendt, 1993; Bowman, 2004; Greene, 1995; Kincheloe, 2003, 2008; Thomson, 2001).

This can be seen, for example, in the work of Paulo Freire (2002; Freire & Illich, 1975) whose concept of critical consciousness or 'conscientization' draws on phenomenology

(see Torres, 2014). Here Freire examines the varieties of social consciousness, and discovers that they may be organised into three main categories. These involve, firstly, the "semi-transitive" state associated with thinking that is dominated by social conditioning. This level of consciousness is characterized by its quasi adherence to an assumed 'objective reality' – its epistemic possibilities are prescribed by that imposed reality, and thus it does not possess the critical distance to authentically engage with reality, to act on it in order to transform it. Second, Freire suggests a "transitive-naïve" type of consciousness that exhibits, among other things, a tendency for facile explanations and over simplification in the interpretation of problems; as well as a preference for rhetoric and reification over dialectic. Third, he posits what he refers to as the "transitive-critical" consciousness. This form of consciousness affords the development of richer structural perceptions; it allows us to look beyond taken-for-granted or imposed ways of perceiving and thinking and engage with experience in new ways. As such, transitive-critical consciousness may be understood to resonate closely with the phenomenological attitude.

In brief, developing the transitive-critical consciousness is liberating when it allows us to see that "the epistemological cycle does not end at the level of acquisition of extant knowledge, but continues through the stage of creation of new knowledge" (Freire & Illich, 1975, 28; see Torres, 2014). This orientation lies at the heart of critical pedagogy, which seeks to identify and decentre the assumptions and power relations that obscure such possibilities, and to thus reveal education as a process of self and world-making (Giroux, 2011; Kincheloe, 2003). By this light, education may only be understood as 'authentic' when it engages and empowers this critically creative potential of the human mind – i.e. "when the practice of revealing reality constitutes a dynamic and dialectic unity with the practice of transforming reality" (Freire & Illich, 1975, 28).

Following the thought of Freire, a number of writers have demonstrated the enormous role the arts may play in realizing these potentials (e.g. Greene, 1995). While creative practice in the arts, critical pedagogy and phenomenology are not simply synonymous with each other, they do overlap and reinforce each other in important ways, with each seeking richer and transformational understandings of human experience. As Ihde (1977) writes, the arts practice their own forms of epoché (ways of suspending taken-for-granted attitudes and perceptions). Indeed, if perception is understood as the foundation of knowledge, then the arts may also be understood to explore and illuminate the most basic ways we make sense of the world. However, the arts also extend into the cultural and historical worlds we inhabit. It follows, then, that the cultivation of a general phenomenological attitude through the arts may indeed support the development of the transitive-critical consciousness and social conscientization discussed by Freire (2002).

Put simply, the arts may initiate, reflect and extend phenomenological and critically-transitive insights when they transform the mundane, introduce new perspectives and thus challenge taken-for-granted ways of perceiving, knowing and being. Maxine Greene (1992) discusses how the arts have the power to "shock" us out of our complacent attitudes – to "release the imagination" so that we may engage more fully with the possibilities of our own experience and thus develop more open, reflective and empathetic relationships with other agents and cultures. Along these lines, a number of

thinkers (e.g. Smith, 1979) have suggested phenomenologically-inspired frameworks for education that begin with students' analyses of direct perception, that proceed through the development of theoretical concepts, often involving (critical) discussion and guidance from teachers, peers and other sources (e.g. readings), and that then involve the integration of new concepts with existing understandings. From this perspective new knowledge and categories are not imposed, but rather emerge through phenomenological analysis and praxis (Clifton, 1983; Ferrera, 1984, 1991).

Here it is also important to note the relevance of this last concept, praxis, which looks beyond the idea of the arts simply as 'practice' – as something one does to achieve some specific end. Rather, praxis involves the development and integration of a range of technical, theoretical, cultural and ethical understandings that are relevant to the lives of students and teachers in order to reveal music and arts education as "a socially rooted, complex, coherent and cooperative activity that grows over time into its own ethical world" (Higgins 2012, 224). Importantly, praxial pedagogical approaches take the unique lived experiences of students and teachers seriously as a central aspect of any curriculum (Elliott & Silverman, 2015; van der Schyff, 2016). This notion of praxis also resonates with a number of phenomenologically-informed perspectives on education – most notably perhaps with the idea of 'education as formation' or Bildung. While this concept has been developed in a number of ways (Brook, 2009; Peters, 2009; Silander et al., 2012), it essentially involves "a creative process in which a person, through his or her own actions, shapes and 'develops' himself or herself and his or her cultural environment" (Silander et al., 2012, 3). From this perspective a fundamental role of education is to create environments where students may begin to engage in this process – where students and teachers may express themselves authentically; becoming self-aware of their own development not simply as externally dictated or as the result of some fixed method (Regelski, 2002), but rather through the formation of new ways of perceiving and thinking that afford richer ways of being-in-the-world. This involves the development of caring (Noddings, 1995) and open-ended educational 'ecologies' where teachers encourage such development through the introduction of a range of relevant activities that challenge students to participate actively in their own learning processes.

Importantly, by this view, educators cannot simply 'teach by the book'. Rather they must acquire a deep first-person understanding of the perceptual and reflective processes they seek to initiate and explore with their students. In other words, they must continually develop their own practice as creative learners so that they may introduce effective projects that engage their students critically and phenomenologically. This, as I began to discuss in the introduction, is why arts-based research is so important for education. More than an academic exercise, arts inquiry projects – developed in connection with relevant critical and phenomenological frameworks – may afford new perspectives and possibilities for the educator, allowing her to more effectively introduce, develop and discuss similar projects in collaboration with students. Indeed, by developing richer understandings of the experience of learning through art-making the teacher may become more than a simple repository of facts and techniques. She may, in her own unique way, come to more deeply embody the process of learning itself, and thus, by example, encourage students to explore their own potentials and become 'master learners' themselves.

Two Multimedia Arts Inquiry Projects

With these concerns in mind, I now turn to consider the two creative multimedia projects mentioned above. For the first piece I created sound for a pre-existing silent film; for the second I created both the visual and auditory dimensions. Additionally, because I wanted to explore how similar projects might be developed in educational contexts, I decided to impose a couple of simple parameters. First, I would have to use technology that would be easily available and relevant to the lives of students. For example, while music and sound students might be encouraged to develop their skills on a more advanced, but easily available, digital audio workstation (DAW), they could start by collecting video and sound with common everyday devices such as iPods, cell phones or tablets, or by researching public domain internet sources. Second, because art and culture do not exist in a vacuum, I decided that in the process of developing each project I should attempt to 'dialogue' with particular art movements, artists, and/or places. In this way, I could explore first-hand how such projects might foster a more engaged, 'phenomenological attitude'. That is, how they might help students move from "onlooker consciousness" to "participatory consciousness" (Bortoft, 1996; see also Cascone, 2014), and thus offer effective ways of exploring the relationship between sound, image, movement, culture and place through their own critical and creative engagements with the world.

Ghosts Before Breakfast

For the first project I chose to score a silent film by the German artist, Hans Richter. Richter is closely associated with the Dadaist movement that developed in Europe during World War I. And his short film, Ghosts Before Breakfast (1927), beautifully captures its political and aesthetic spirit. As I watched the film over and over I was struck not only by its originality, and the wit and virtuosity with which it was constructed, but also by the message of Dada itself and its relevance for the 21st century. As a highly playful but nevertheless subversive art movement, Dada strove to shock people out of a complacent attitude towards the world in which they lived. For the Dada artists, this was the same attitude that led to the humdrum drudgery, consumerism and regimentation of modern bureaucratised life, as well as the increasing use of rational (technological-scientific) means to realise and justify irrational ends (which culminated in the horrors of the War). And Indeed, an art movement such as Dada can be seen as encouraging 'transitive-critical' consciousness when it abstracts and aestheticises the mundane objects, activities, and institutions we live with and through, thus loosening the sedimented or natural attitudes that tend to frame non-reflective experience. Here one might consider Marcel Duchamp's 'readymades' or the politically-charged collages of Hanna Hoch and John Heartfield. And likewise, in Richter's film even inanimate material objects are possessed by a spirit that moves them to break free of their taken-for-granted functions and relationships: fire hoses dance; falling teacups reassemble themselves; firearms refuse to aim; targets refuse to be aimed at; and the dehumanizing march to war or the factory becomes a playful absurdist choreography.

With this in mind, Ihde's (1976) phenomenology of the auditory and visual dimensions (above) may offer a useful framework for analysing the perceptual and creative processes involved in scoring a silent film like this. For example, we may note, most obviously perhaps, that although the experience of viewing the unscored film is characterised by movement there is no accompanying auditory dimension. That is, the experience seems to be characterised by those moving →y→ type entities that normally involve a synthesis of both sight and sound. Here, however, the auditory dimension is not given and must be 'found' (or imagined and created). Interestingly, this inverts the habitual phenomenological relationship between →y→ and –z– type entities (those moving sound-making entities that are not initially present in the visual dimension, but that are often sought after). Moreover, many of the moving entities in Ghosts Before Breakfast are the types of inanimate objects that we normally experience as mute (x types) unless they are moved by some external force (i.e. they are not entities that move themselves). In the film, however, such objects do move, and apparently by their own volition, or by some force that remains within the horizon of invisibility (e.g. the wind, or in this case, ghosts). Again, Richter uses the technology available to him brilliantly, playing with and transforming these relationships we take for granted in day-to-day life. In doing so, he opens a world of possibilities for those of us, who, a century later, wish to accept the task of bringing an auditory dimension to his film.

For me the challenge was not simply to accompany Richter's imagery, but to create a sonic world that would dialogue with it. Following the Dadaist aesthetic, I would have to develop a sonic pallet that introduced sounds that were both absurd and familiar, but that (like the film) always placed the familiar in an unfamiliar context. Moreover, the sound world I created would have to 'animate' the moving imagery – it would have to

'make present' the invisible forces that bring the otherwise 'mute objects' to life. Additionally, I also wanted to give the flavour of what I imagined to be a mix of sounds and music that resonated with the historical context of the film, but that were also integrated with sounds closer to today. For inspiration I turned to the work of early Musique Concrète and electronic music pioneers like Pierre Schaeffer (2014), Pierre Henry and Edgar Varèse, as well as recorded performances on early electronic instruments (e.g. the Theremin). I also refreshed my understanding of the historical context of both Dada and early experimental music through various readings (Ades, 2006; Dack, 2013; Holmes, 1985; Manning, 1985; Richter,1997; Wallace, 2011).

Collecting and organising the sonic material I was going to use was both challenging and revealing. I spent a few days simply searching for sounds by experimenting with the parameters of various software synths, collecting anything that caught my ear in my large library of sound effects and by recording an array of 'found' sounds (I kept a portable recording device with me much of the time as I didn't want to miss anything). This last process was perhaps the most informative. As I experimented with the relationship between these sounds and the moving images of the film I discovered that many of the environmental sounds that I had previously taken-for-granted, ignored, or found annoying, could be appreciated in new ways: a truck idling outside; a phone ringing; a creaky door closing; a jet flying overhead. As a number of field or 'soundscape' recordists have noted, even the simple act of capturing audio can afford valuable new perspectives (Cascone, 2014; Cox, 2015; Lane & Carlyle, 2013). And indeed, it was just this heightened sense of possibility that I needed if I was to join Richter in the process of transforming the mundane into the novel. In the end, I developed a mix of sound effects (e.g. race car engines, fax machines); recorded sounds from my day-to-day environment (bicycle wheels, traffic and household sounds, radio noises); synthesised models that echoed electronic instruments developed in the first half of the 20th century; as well as a solo recording of the great early jazz drummer, Laurence 'Baby' Dodds (1946).

The process of scoring Richter's film afforded me the opportunity to push my skills with the audio software (Logic) and to explore new creative possibilities for recording techniques (e.g. extreme close miking) and mixing-editing (juxtaposing seemingly unrelated sounds in order to develop new ones or to discover previously unconsidered relationships). It also allowed me to play with expected causal relations between the visual and auditory dimensions by associating images and sounds that do not normally belong together. With this in mind, Schaeffer's (1966) phenomenological listening techniques – which were set in motion through his interactions with emerging mid-20th century audio recording technologies – may offer many useful insights. Schaeffer offers numerous ways of attending to and analysing sounds (or 'sonic objects') that have been abstracted from their sources and contexts (i.e. acousmatic listening). Along these lines, readers may also wish to consider Michel Chion's (1994) modes of (cinematic) listening. Extending many of Schaeffer's insights, Chion draws out a number of interesting reflections on the experience of causality in the auditory dimension, with a focus on developing the 'active' forms of perception associated with what he calls 'reduced listening' (see also Chion, 1983; Smalley, 1986, 1997). Put simply, Chion argues for the phenomenological importance of reduced acousmatic listening when it

allows us to bracket assumptions about visual causes and attend more closely to the sounds themselves, thereby revealing sonic traits that might normally remain hidden.

Developing similar projects in pedagogical contexts might, among other things, offer ways to explore the idea of sound recording as a creative process – that is, to look beyond recording simply as a replicating or 'repeating' function and explore it as a 'compositional' process (Attali, 2014); as a way of developing an "imaginative perception" (Cascone, 2014; Droumeva, 2015). Indeed, such projects may foster new understandings and possibilities for sound and meaning-making, especially in terms of attending to and transforming taken-for-granted perceptions. This could involve developing old methods and assumptions in new ways, as well as the recycling of older documents and technologies in new contexts (e.g. through sampling, looping etc.; Sterne, 2003). Equally importantly, the process of researching and creatively 'dialoguing' with artists and their works, as well as with aesthetic-political movements and relevant historical factors might accomplish a number of more general pedagogical goals that resonate with the phenomenological and critical concerns discussed above. These include: i) breaking down dualist assumptions by explicitly enmeshing the student-artist in the research as an active participant, as opposed to a detached onlooker; ii) decentring language and text as the primary tools of learning and meaning-making; and iii) highlighting the meaning of art-making as a way of attending to the world in new ways, where radical shifts in aesthetic perceptions, and critical engagements with historical movements, may lead to important inquiries into self, culture and society (Benson, 2001; Johnson, 2007; van der Schyff, 2015).

Berlin HBF

The footage (audio and video) for Berlin HBF was collected with an iPod during a two-hour stop over at an enormous multi-level train station in Berlin. At the time I captured

the video I was very interested in early 20th century film and photography (e.g. the Russian Constructivists, German Expressionists, and the American, Paul Strand). In the spirit of what we now refer to as 'modernism', the artists of this period used the camera to develop new ways of experiencing the world. Their imagery often explores everyday themes viewed from unusual vantage points and in unusual contexts: extreme angles and close ups; slow, stop and reverse motion; animation; juxtaposition of images; over exposure; negative images; montage or 'jump cuts' (see Wallace, 2011). The Berlin station provides an excellent place to gather such footage. It is constructed in such a way that one can gain simultaneous views of its various levels; its glass and metal floors and barriers make for a wonderful play of reflection, shadow and perspective. As per the self-imposed parameters mention above, I edited and manipulated the video footage using only the tools available to me through iMovie.

Not surprisingly perhaps, this location also offers an outstanding acoustic environment – where the local 'soundscape' (Schafer, 1994) and the 'aural architecture' (Blesser & Salter, 2007) it plays out in are highlighted by the heightened forms of phenomenological awareness associated with sound and video collection. In this space the interplay of 'noise' and the meaningful (iconic, indexical, and symbolic) audio signals provides a fascinating play of sound and image: words, music, and other sonic markers presented through loud speakers; the movements and voices of people waiting, going here and there; the arrival and departure of trains; as well as the continuous reflection, reverberation and mixing of such sounds throughout the station.

I decided to develop a rather minimalist sound score to accompany the imagery – one that would not force specific emotional responses. Instead, I hoped to keep the feeling of the work 'open' so that the audience might be invited into it – to look, listen and develop their own relationships rather than be shown. In the end, I used the sounds of the station environment itself mixed with electronic manipulations that play with the various hums, rumbles, rhythms and ringings of the trains themselves. To conclude I added an 'epilogue' view from the train inspired by the bold colours and shapes of expressionism – one that moves increasingly towards total abstraction in the visual modality; and where the auditory field finally takes over and approaches something more like 'music'.

Similar 'environmentally-based' projects might provide an excellent opportunity for students to reflect on the urban spaces they live through – which, like the Berlin train station itself, may be understood as multi-layered, relational and constantly transforming thanks to the various ways people inhabit them (Hosokawa, 1984). And here again, Ihde's reflections on sound, vision and space are illuminating. As with the experience of the cathedral discussed above, the train station may also be explored in terms of the unique way its architecture interacts with the entities that move within and through it – the sources of sounds may be searched for, but not always found; movement, objects and space may be attended to and juxtaposed in a range of ways. The process of developing such projects with students could thus inspire more pluralistic, phenomenological (Ihde, 1974; Macedo, 2013) or 'enactive' perspectives (van der Schyff, 2015; Varela et al., 1993) on what the experience of sonic environments entails, as well as a deeper recognition of sound as a primordial backdrop to social existence.

This all resonates with R.M. Shafer's (1994, 1986) original vision for 'soundscape studies' as an interdisciplinary field with strong pedagogical (and phenomenological) aspirations in applied contexts. And indeed, Schafer's broad historical, architectural, geographical, and cultural surveys of the human and natural soundscapes, as well as his phenomenological exercises for 'clairaudience' or 'ear cleaning', continue to hold great relevance for education. Today, however, artists, students and teachers have access to unprecedented creative opportunities afforded by technology – most notably the ability to collect relatively high-quality video and audio from user-friendly devices that fit in the palm of their hands. 'iPod culture' (Bull, 2008) has rapidly developed into a distinctly multi-media and multi-modal phenomenon. In brief, we may now easily bring images and sounds of the city home with us, and through creative projects such as I have discussed, transform how our environments are perceived (see also Droumeva, 2015). With this in mind, a project like Berlin HBF could be developed further by feeding the video and sound material back into the original environment as a multi-media installation, perhaps spread across multiple screens, projections and audio outputs.

Conclusion

The process of scoring Ghosts Before Breakfast involved a direct encounter with a specific work (Richter's film) and a cultural movement (Dada). By contrast, Berlin HBF developed image and sound through the lens of a more general aesthetic sensibility (modernist film) in an environmental context. In different ways, however, both initiated an investigation into the space where lived experience – the sounds, places and perceptions of everyday life – meets culture, history and 'the aesthetic'. In pedagogical contexts, similar projects could integrate a wide range of concerns that are traditionally approached separately if at all in contemporary education. As I have suggested, this may afford teachers and students a means of developing knowledge of various historical figures, works and cultural movements, and living environments in ways that do not divorce such inquiries from creative practice. Indeed, exploring these themes in the context of lived experience highlights their relevance for the life of the artist-student, potentially encouraging a more critical, transformative and culturally literate understanding of what art making entails. Along these lines, this praxis-based approach might also aid students and educators in developing useful theoretical-aesthetic understandings that might otherwise remain obscure when their relevance is not immediately apparent for the creative life of the student. In other words, this approach could help educators introduce complex critical and phenomenological concepts through practice, thereby allowing them to be grasped more efficiently and comprehensively – i.e. from a range of lived intellectual, embodied, emotional, social and aesthetic vantage points.

Lastly, such projects may offer a way for students to develop technique in media production within the living context of art making and to explore the techniques and challenges facing artists who work in other disciplines. This could foster a broader and more inclusive appreciation of the creative process, as well as a more open-ended and collaborative aesthetic sensibility. Indeed, the next step for the approach I have outlined here will involve documenting how such projects might be developed by

phenomenologically and critically engaged students; and what new understandings are revealed in the process. Along these lines, it would be very interesting to explore similar projects in the context of theatre, music and dance, interdisciplinary improvisation and ecological and environmental studies (e.g. bio-acoustics; see Krause, 2013), or to attempt larger scale multi-person collaborative works that bring together students, artists and researchers across a range of disciplines, including, for example, architecture and the sciences. This would also add an important social aspect to such creative research projects – one that is lacking in the more or less solitary processes involved in developing the works discussed above. In brief, such projects could form an important part of the collaborative, interdisciplinary and creative pedagogical environments associated with the idea of education as 'formation' (Bildung) discussed in this paper (Macedo, 2013).

Of course, many more possibilities remain to be explored. Nevertheless, I hope that the processes and ideas I have explored here might contribute to richer accounts of how sound and media studies may be developed in creative, critically reflective, praxis-based pedagogical contexts; that they will be useful to artist-teachers who wish to introduce multi-media projects into their educational practice; and that they might inspire emerging creative 'sound students' (Sterne, 2012) who are just beginning to develop and share their sonic imaginations.

References

Ades, D. 2006. *The Dada Reader: A Critical Anthology*. Chicago: Chicago UP.
Arendt, H. 1993. *Between Past and Future*. New York: Penguin Books.
Attali, J. 2014. *Noise: The Political Economy of Music*. Minneapolis, MN: University of Minnesota Press.
Blesser, B., and Salter, L.R. 2007. *Spaces Speak, Are You Listening?: Experiencing Aural Architecture*. Cambridge MA: MIT Press.
Barone, T. and Eisner, E. 2012. *Arts Based Research*. Thousand Oaks, CA: Sage Publications.
Benson, C. 2001. *The Cultural Psychology of Self: Place, Morality and Art in Human Worlds*. London: Routledge.
Bortoft, H., 1996. *The Wholeness of Nature : Goethe's Way Toward a Science of Conscious Participation in Nature, 1st edition*. Lindisfarne Press, Hudson, N.Y.
Bowman, W. 2004. Cognition and the Body: Perspectives from Music Education. In L. Bresler (Ed.) *Knowing Bodies, Moving Minds: Toward Embodied Teaching and Learning* (pp. 29-50). Netherlands: Kluwer Academic Press.
Bresler, L (Ed). 2007. *International Handbook of Research in Arts Education*. Dordrecht, The Netherlands: Springer.
Brook, A. 2009. The Potentiality of Authenticity in Becoming a Teacher. *Educational Philosophy and Theory*,41(1), 46–59.
Bull, M. 2008. *Sound Moves: iPod Culture and Urban Experience*. New York: Routledge.
Burnard, P. 2007. Reframing creativity and technology: promoting pedagogic change in music education. *Journal of Music Technology and Education, 1*(1), 37-55.
Cascone, K. 2011. *Transcendigital Imagination: Developing Organs of Subtle Perception*. Interference: A Journal of Audio Culture, 3. Available on line: http://www.interferencejournal.com/articles/sound-methods/transcendigital-imagination-developing-organs-of-subtle-perception
Casey, E. 2000. *Imagining: A Phenomenological Study*. Bloomington: Indiana UP.
Clifton, T. 1983. *Music as Heard: A study in Applied Phenomenology*. New Haven: Yale University Press.
Chion, M. 1983. *Guide des Objets Sonores : Pierre Schaeffer et la Recherche Musicale*. Paris: Buchet/Chastel: Institut national de la communication audiovisuelle.
Chion, Michel. 1994. *Audio-Vision: Sound on Screen*. New York, NY: Columbia UP, 1994
Cox, T. (2015). *Sonic wonderland: A scientific odyssey of sound*. New York: Vintage Books.
Dack, J. 2013. Collage, Montage and the Composer Pierre Henry: The Real, the Concrete, the Abstract in Sound Art and Music. *Journal of Music, Technology & Education,6*(3), 275-284.
Dodds, B. 1946. *Talking and Drum Solos* [audio recording]. Chicago: Atavistic Worldwide (re-released 2003).
Dreyfus, H. 1997. Highway Bridges and Feasts: Heidegger and Borgmann on How to Affirm Technology. *Proceedings of the Conference on After Postmodernism*. Available online: http://www.focusing.org/apm_papers/dreyfus.html
Droumeva, M. 2015. Curating Everyday Life: Approaches to Documenting Everyday Soundscapes. *Media - Culture Journal,* Vol. 18, No. 4

Elliott, D.J. and Silverman, M. 2015. *Music Matters: A Philosophy of Music Education* (Second Edition). New York: Oxford UP.
Ferrera, L. 1984. Phenomenology as a Tool for Musical Analysis. *Musical Quarterly, 70* (3), 355-373.
Ferrera, L. 1991. *Philosophy and the Analysis of Music*: *Bridges to Musical Sound, Form and Reference*, Westport, CT: Greenwood Press.
Ferreira, M. 2007. Crossing Borders: Issues in Music Technology Education. *Journal of Music, Technology and Education*, *1*(1), 23–35.
Freire, P. 2000. *Pedagogy of the Oppressed: 30th Anniversary Edition*. New York: Bloomsbury Academic.
Freire, P. and Illich, I. 1974. *Diálogo Paulo Freire-Ivan Illich*. Buenos Aires: Editorial Búsqueda- Celadec.
Gallagher, S. 2012. *Phenomenology*. New York: Palgrave Macmillan.
Giroux, H. 2011. *On Critical Pedagogy*. New York: Continuum.
Greene, M. 1995. *Releasing the Imagination: Essays on Education, the Arts, and Social Change*. San Francisco: Jossey-Bass Publishers.
Ihde, D. 1974. The Experience of Technology. *Cultural Hermeneutics, 2*(1), 267-269.
Ihde, D. 1976. *Listening and Voice: A Phenomenology of Sound*. Athens: Ohio University Press.
Ihde, D. 1977. *Experimental Phenomenology: An Introduction*. New York: G.P. Putnam's Sons.
Ihde, D. 1998. *Philosophy of Technology: An Introduction*. New York: Paragon.
Higgins, C. 2012. The Impossible Profession. In W. Bowman and A. L. Frega (Eds.) *The Handbook of Philosophy in Music Education* (pp. 213-230). New York: Oxford UP.
Holmes, T.B. 1985. *Electronic and experimental music: history, instruments, Techniques, performers, recordings*. New York: Charles Schribner's Sons
Hosokawa, S. 1984. *The Walkman Effect*. Popular Music, 4, pp. 165-180.
Heidegger, M. 1962. *Being and Time*. New York: Harper and Row.
Heidegger, M. 1982. *The Question Concerning Technology and Other Essays*. New York: Harper Perennial.
Husserl, E. 1970. *The Crisis of European Sciences and Transcendental Philosophy*. Evanston: Northwestern UP.
Johnson, M. 2007. *The Meaning of the Body: Aesthetics of Human Understanding*. Chicago: Chicago UP.
Kim, S. 2010. A Critique on Pierre Schaeffer's Phenomenological Approaches: Based on the Acousmatic and Reduced Listening. Pierre Schaeffer Conference: mediART in Rijeka, Croatia, on Oct. 7, 2010
Kincheloe, J.L. 2003. Critical Ontology: Visions of Selfhood and Curriculum. *Journal of Curriculum Theorizing, 19*(1), 47-64.
Kincheloe, J.L. 2008. *Knowledge and Critical Pedagogy: An introduction*. London: Springer.
Krause, B. 2012. *The Great Animal Orchestra: Finding the Origins of Music in the World's Wild Places*. New York: Black Bay.
Knowles, J.G. and Cole, A.L. 2008. *Handbook of Arts in Qualitative Research*. Thousand Oaks, CA: Sage Publications.
Lane, C. & Carlyle, A. (Eds.) 2013. *In the Field: The Art of Field Recording*. Axminster, UK: Uniform Books.

Leavy, P. 2015. *Method Meets Art: Arts-Based Research Practice*. New York: Guilford Press.
Macedo, F. 2013. Teaching Creative Music Technology in Higher Education: A Phenomenological Approach. *Journal of Music, Technology & Education, 6*(2), 207-219.
Manning, P. 1985. *Electronic and Computer Music*. Oxford: Oxford UP.
Merleau-Ponty, M. 2002. *Phenomenology of Perception*. London: Routlede
Noddings, N. 1995. *Philosophy of Education*. Boulder, CO: Westview Press.
O'Neill, S. A., & Peluso, D. C. C. 2013. Using dialogue and digital media composing to enhance and develop artistic creativity, creative collaborations and multimodal practices. In P. Burnard (Ed.), *Developing creativities in higher music education: International perspectives and practices* (pp. 142-162). Abingdon, OX: Routledge.
Peters, M. A. 2009. Heidegger, Phenomenology, Education. *Educational Philosophy and Theory*, *41*(1), 1–6.
Regelski, T. A. 2002. On "Methodolatry" and Music Teaching as Critical and Reflective Praxis. *Philosophy of Music Education Review, 10*(2), 102-123.
Richter, H. 1927. *Ghosts Before Breakfast* [Video file]. Retrieved from http://www.youtube.com/watch?v=QkkAzYS9nGU
Richter, H. 1997. *Dada: Art and Anti-art*. London: Thames & Hudson.
Schafer, R.M. 1994. *The Soundscape: Our Sonic Environment and the Tuning of the World*. Rochester, VT: Destiny Books.
Schafer, R.M. 1986. *The Thinking Ear: Complete Writings on Music Education*. Bancroft, ON: Arcana Editions.
Schaeffer, P. 1966. *Traité des Objets Musicaux: Essai Interdisciplines*. Paris: Éditions du Seuil.
Schaeffer, P. 2014. *In Search of a Concrete Music*. Berkeley CA: University of California Press.
Silander, P., Kivelä, A. & Sutinen, A. (Eds.). 2012. *Theories of Bildung and Growth: Connections and Controversies Between Continental Educational Thinking and American Pragmatism*. Rotterdam: Sense Publishers.
Simoni, M. (Editor). 2013. Best Practices in the Pedagogy of Electroacoustic Music and its Technology. *Organised Sound: An International Journal of Music and Technology, 18* (Special issue 02).
Slater, M. and Martin, A. 2012. A Conceptual Foundation for Understanding Musico-Technological Creativity. *Journal of Music Technology and Education, 5*(1), 59-76.
Smalley, D. 1986. Spectro-morphology and Structuring Processes. In S. Emmerson (Ed.) *The Language of Electroacoustic Music* (pp. 61–92). London: Macmillan,
Smalley, D. 1997. Spectromorphology: Explaining Sound-Shapes', *Organised Sound*, *2*(2), 107–25.
Smith, F.J. 1979. *The Experiencing of Musical Sound: Prelude to a Phenomenology of Music*, New York: Gordon and Breach.
Sterne, J. 2003. *The Audible Past: The Cultural Origins of Sound Reproduction*. Durham NC: Duke University Press.
Sterne, J. 2012. Sonic Imaginations. In J.Sterne (Ed.) *The Sound Studies Reader* (pp. 2-17). New York: Routledge.
Taylor, T. D. 2011. The seductions of Technology. *Journal of Music, Technology and Education*, *4*(2&3), 227–32.

Thomson, I. 2001. Heidegger on ontological education, or: how we become what we are. *Inquiry, 44*, 243-68.
Torres, C.A. 2014. *First Freire: Early Writings in Social Justice Education*. New York: Teachers College Press.
van der Schyff, D. 2015. *Music as a Manifestation of Life: Exploring Enactivism and the 'Eastern Perspective' for Music Education*. Frontiers in Psychology, 6: 345 http://dx.doi.org/10.3389/fpsyg.2015.00345
van der Schyff, D. 2016. Praxial Music Education and the Ontological Perspective: An Enactivist Response to Music Matters 2. *Action, Criticism, and Theory for Music Education, 14(*3), 75-105. http://act.maydaygroup.org/articles/vanderSchyff14_3.pdf
van der Schyff, D. forthcoming. From Necker Cubes to Polyrhythms: Fostering a Phenomenological Attitude in Music Education. *Phenomenology and Practice*.
van Manen, M. 2014. *Phenomenology of Practice: Meaning-giving Methods in Phenomenological Research and Writing*. Walnut Creek, CA: Left Coast Press.
Varela, F., Thompson, and Rosch, E. (1993). *The Embodied Mind: Cognitive Science and Human Experience*. Cambridge MA: MIT Press.
Wallace, J. 2011. *Beginning Modernism*. Manchester: Manchester UP.
Wilson, C. & Brown, M. 2012. Sound, Space, Image and Music: Hybridity in Creative Process Through Technology, Interactivity and Collaboration. *Journal of Music Technology and Education, 5*(1), 89-107.
Wishart, T. 1992. Music and technology: Problems and possibilities. In J. Paynter et al. (Eds), *Companion to Contemporary Musical Thought* (pp. 565–582). New York: Routledge.

Acknowledgements
I would like to thank Rachel O'Dwyer and Linda O'Keeffe, as well as the anonymous reviewers, for their helpful comments on previous drafts of this paper.

Bio
Dylan van der Schyff is a performing musician, music teacher, and a researcher in philosophy of music and music education. As a performer he has contributed to over 100 recordings, spanning the fields of jazz, free improvisation, experimental, electronic and 'new music'. He has also participated in numerous collaborative projects involving theatre dance and film. Dylan's academic work engages a range of interdisciplinary knowledge and research to explore questions related to how and why music and the arts are meaningful for human beings. His publications appear or are forthcoming in journals such as Phenomenology and Practice, Frontiers in Psychology, Psychomusicology, Action, Criticism and Theory for Music Education, and Phenomenology and the Cognitive Sciences. Dylan's current PhD research in the Faculty of Education at Simon Fraser University is funded by the Social Sciences and Humanities Research Council of Canada.

A Study of Sound Objects and Structures

By Frank Dufour

Abstract

This paper describes a pedagogical method to engage students in the study of sound objects using an acousmatic, phenomenological approach. The interdisciplinary course is taught at the undergraduate level in the school of Arts, Technology, and Emerging Communication at the University of Texas at Dallas. The primary goal of the course is to teach students to become experts of their own listening. Schaeffer's Solfège des Objets Musicaux (1966) shaped the design of this phenomenological approach to teaching auditory perception while the framework of Temporal Semiotic Units (TSUs) supported the approach to musical structures. The paper first describes the theoretical foundation for the study method, then describes students' progression through the phases of the learning experience, and concludes with an invitation for more research about leading students towards greater understanding of the cognitive processes engaged by auditory perception.

Keywords

auditory perception, education, phenomenology, sound object, sound studies, temporal object, sound object

An Acousmatic, Phenomenological Approach to Teaching the Study of Sound Objects

This paper describes a lesson designed by the researcher in the "Introduction to Sound Design" course taught in the Bachelor of Arts program in the school of Arts, Technology, and Emerging Communication at the University of Texas at Dallas. The class is a prerequisite for all undergraduate courses in sound design. Within the contemporary digital environment the production of audiovisual content is organized by technologies through a continuous chain of virtual processes. However, a displacement of focus occurs during these processes that results in a greater importance given to each separate process as opposed to the phenomenon of their production. The lesson described here was an attempt by the instructor to separate the object from the production process in order to teach students to understand the cognitive processes engaged by auditory perception.

The nature of digital sound objects is characterized by their immateriality and plasticity, and this makes it difficult to identify, seize, and maintain a consistent relationship with them. In digital production, a sound effect does not exist consistently and stably from one phase to another of the production flow or from one technological environment to another. Rather, it changes appearance as it is carried over different workstations and represented through different interfaces. Therefore, depending upon the computational

settings, sound objects are open to an infinite variety of transformations and actualizations that become unexamined by the sound designer. While the technological environment is generally thought to foster creativity and to allow for more fluid production processing, it presents a risk, especially in an educational context, of diverting attention and intention from the sound itself to the profit of the technological processes. The pedagogical challenge is to refocus students' singular attention to sound objects. Engaging students in a meaningful relationship with sound can lead to their deeper understanding of its expressive potential. This paper discusses a phenomenological teaching approach for the study of sound objects that focuses upon acousmatic contexts and use of a descriptive vocabulary provided in Schaeffer's morphology of sound glossary. It emphasizes a means to synthesize the various aspects of interactivity with sound into a consistent experience. While phenomenology and the theoretical framework derived from Pierre Schaeffer's (1966) study of the sound object are frequently used in educational programs in music or other sound studies, their use in instruction for technological and industrial applications of audiovisual products is rare. Sound and images are also considered to be technological effects; that is, they are caused and generated by technological devices i.e. screen, computer, loud speaker, headset that are constantly present and identify their origin. The pedagogical practice described here assumes and takes advantage of this "schizophonic" setting to focus on the reception of auditory phenomena without questioning their natural and technological origins.

In order to discuss this practice, a preliminary distinction must be made between the studies of sound conducted in different disciplinary fields such as acoustics, psychoacoustics, engineering, and music. Seemingly a mere rhetorical distinction, it is premised upon Schaeffer's central idea in "Traité des Objets Musicaux" that a sound object is neither the realistic object of acoustical studies nor the ideal object of musical studies[1]. Rather, a sound object is intentional and emerges at the intersection of the external acoustic manifestation of sound and the intention of the listener pointed toward this manifestation. Kane Bryan wrote,

> "This object of intentionality is not the same as the physically material object, which, from a scientific perspective, causes my perceptions. Being the correlate of an act of synthesis on my part, the intentional object is no longer bound to any particular spatio-temporal adumbration. It is independent of any factual context—it has become an essence[2]".

Study Design

A core trait of phenomenology as a research methodology is the inclusion of participants' experience in the research. Unlike other study methods in which subjects remain uninformed of the researcher's goals, the phenomenological method requires consent, knowledge of the goals and methods of the study, and active participation in the formation of the knowledge produced by the research. Therefore, students were given terms and concepts to enable a new awareness of their relationship with active auditory perception. For instructional purposes, the sound object was presented to students as the synthesis of processes and revealed to them gradually as the lesson unfolded. Throughout the semester, students engaged in active discovery of their own listening experience as they were encouraged to examine sound objects from a clearly

asserted subjective perspective. The researcher framed the students' experience through the listening process by adopting the use of Schaeffer's typo-morphology of the sound object to enable them to describe their experience of the sound object uniformly and to later observe intersubjective verification with research by sound designers and music composers.

As a philosophical discipline and as a research methodology, phenomenology also allows "one to delineate carefully one's own affective, emotional, and imaginative life, not in a set of static objective studies such as one finds in psychology, but understood in the manner in which it is meaningfully lived"[3]. Focusing on perception and on the modes of appearance of the world to consciousness, a phenomenological approach to sound offers the possibility to synthesize, individually and collectively, the multiple experiences of sound into one singular object, which we define as a sound object. With a goal to train future sound designers who will be responsible for creating and organizing sounds and sound sequences with a specific intention and purpose, this theoretical approach offers the greatest potential to increase students' awareness of the potential of sound objects within the production process.

In the study of sound, music, and perception, phenomenological research approaches have a very rich tradition. One of the most prominent researchers in the study of sound and music has established his framework within phenomenology: Pierre Schaeffer, the inventor of *musique concrete*. Seminal studies conducted by this pioneer are focused and centered upon the idea that listening is the act of perception constitutive of the sound object. Of value to educators of sound design, the researchers ground their work in a radical re-conditioning of the act of listening, specifically *acousmatic practice*, which render production and observation of the sound object more meaningful. The course lesson was therefore shaped by the practice of *acousmatic* listening developed by Schaeffer, and was the preliminary step leading to a general understanding of sound objects and sonic structures for student sound designers. Specifically, the acousmatic situation is centered upon the act of listening, which is identified as the origin of the phenomenon to be studied. It therefore shifts the investigation of sound objects from questioning subjectivity or subjective listening to an examination of the acts of a subject's consciousness. In the *acousmatic* situation, "…the subject is asked to describe his own perception itself, instead of the external references to the perceived sound"[4].

Acousmatic theory refers to the Pythagorean experience in which disciples would listen to Pythagoras hidden behind a veil in order to discern meaning absent of other modes of perception. In its contemporary version the experience is supported by audio recording and reproduction technologies, which allow for the separation of a sound from its source. For Schaeffer, this practice allows for the bracketing of causal listening, whose primary intention is to identify the sound as the effect of a physical and visible cause and leads to the phenomenon of acousmatic listening. In order for a sound designer to achieve the synthesis of experience and understanding of perception, it is necessary to perform a radical transformation of the notion and practice of listening. For most students listening is not an activity, it is merely a passive reception by which a meaning or message is given by auditory means, while the real activity is taking place afterwards and consists of reflecting upon some of the aspects of the sound that have been memorized and can thus be described. This preconceived notion that listening is an *a-*

posteriori abstract and conceptual activity has to be put aside, or bracketed, as Husserl explains, to thoughtfully examine perception and induce valid descriptions of the content of perception. The shift required to perform such bracketing is temporal, and it aims to situate participants and their experience within the present. For this reason, in the first experiments conducted in the class, students were not asked to listen to a sound, and *then*, describe it, but rather were invited to draw along the duration of the sound something that would represent it. These initial experiments established the context for their listening for the remainder of the class. The first experiments also framed the initial phase of phenomenological research by offering an examination of the *nowness* of auditory perception and raw sound objects among students.
Moustakas and Clark describing phenomenological epoché, *or the moment of suspended judgment,* assert the difficulty of establishing and maintaining this type of observation for both designers and researchers[5]. The epoché frames this study of the sound object in practice, employing a looping sequence of these four phenomenological phases: Epoché, Reduction, Eidetic variation, and Intersubjective verification

Epoché allowed the student to experience the immediacy of the sound object, its real existence as a temporal object, and to anchor the experience of sound objects in the present. Furthermore, *epoché* was not just the primary practice of students, but also the context required for observation of student experiences to be maintained and redefined for the purpose of the study. Through the emergence of the temporal dimension in epoché, the raw sound object was revealed and made available for a closer examination by students. Reduction could then be applied to the raw sound object in order to capture its perceptual dimensions and the primary traits of its identity.

Lesson Design

Phase 1: Epoché
During the first phase of the lesson, students were asked to respond to questions about the permanence of the sound object:

What allows me, along the perception of the sound object, to maintain a unique and identical intentionality? What of the immediate past and/or the near future constitutes a persistently coherent context with what is perceived?

In terms of phenomenology, this phase addressed the primary retention and protention associated with the perception of a temporal object as a unique form. Husserl defines perception, retention and protention as the three components of the identity of the sound phenomenon[6]. These components comprise a single mental process running in both directions, from the present to the past, and from the present to the future. This intentional process maintains a consistent impression of the temporal object throughout the continuum of its changes. The impression of what is just passed, retention, and the anticipation of what is about to happen, protention, are continuously informed by the flow of changes and maintained as a unique object of intentionality. Pedagogically, the use of primary retention permitted students to point to different dimensions of the sound object, and towards which their attention should focus when listening for identification.

Phase 2: Reduction

In the second phase, students experienced sessions of reduced listening framed by each of the four dimensions identified by Schaeffer in the Typomorphology section of his work in *Traité des Objets Musicaux,* which include material, sustainment (or energetic articulation), form, and variation. The dimension of material contains the manifestations of the spectral qualities of a sound object i.e. mass and harmonic timbre. As students learned, the sustainment, or energetic articulation, dimension pertains to the variations of energetic texture of the sound throughout its existence. The form dimension characterizes the envelope of the sound throughout its evolution and contains the criteria of dynamic profile and attack. Finally, the variation dimension relates to the consistent modes of variation of the mass or height of the sound. This part of the lesson was intended to produce different intentional sound objects from the same auditory material. In these sessions, each sound was presented four times, one for each dimension. This phase was inspired by Schaeffer's description of reduced listening where the various dimensions of the sound object are used to differentiate between several sources in a complex auditory environment, instead of their assumed origins[7]. For example, in a recording of a typical urban soundscape, human voices were differentiated from the traffic noises on the basis of their mass and harmonic profile in the dimension of material, and of their gait in the dimension of energetic articulation.

In this portion of the lesson, we began to share and compare the results of our analyses. We waited in order that we might initiate a collaborative process over the production of converging impressions without individual views tainting consensual production. What was gained at the end of this phase was a set of intentional "lenses" allowing us to grasp the sound object's behaviours in the four dimensions of its existence. These behaviours, or qualities that are entirely inherent to the sound object and attached to it, allow for the differentiation of the sound object, but not yet for their description. It is only when these qualities can be connected with perceptual invariants that the sound object can be described as a structure of these qualities.

Phase 3: Eidetic Variation

The point of studying eidetic variation marked a return to the object itself with the goal to contribute to the emergence of structured descriptions of the experience. The overarching question for this inquiry was framed by a question about how primary retentions, or morphological qualities of the sound object, organize the constitution of its identity. The experiments performed during this phase were essentially detailed descriptions of each of the qualities exhibited by various sound objects in the four dimensions of their existence. The analyses were performed individually and their results were shared, discussed, and combined to form convergent qualitative descriptions of the sound objects. This phase allowed for the emergence of a precise vocabulary pointing to the acoustical qualities of the sounds and employed the numerical scale proposed by Schaeffer, as described below.

The dimension of material, the mass of the sound, or its way of occupying the field of frequencies, is examined using a numerical scale ranging from 1 to 7 with the following description:

1. sine wave
2. single pitched musical sound
3. chords and groups of pitched musical sounds
4. bells, metal plates, gong
5. group of distinct (or distinguishable) coloured white noise
6. coloured white noise
7. white noise

This quality was coupled in students' analyses with the melodic profile and the profile of mass displayed in the dimension of variation. The melodic profile relates to the perception of movement of the sound in the field of pitch. This movement can be continuous, *glissando*, or discontinuous, scale based; it can be of small or great amplitude; fast or slow; cyclical, unidirectional or bi-directional. The three types of melodic profile are fluctuation, evolution and modulation.

Observation of the profile of mass relates to the perception of inner movement in the qualities of mass and harmonic timbre without necessarily any change in pitch. This coupling reveals that the consistency of sound objects, or the capacity to seize them as unified forms, was in part supported by the articulation of these qualities:

• sounds with a heavy mass (4-7) appear as consistent forms if their profile of mass is primarily continuous and slow • sounds with a lighter mass (1-3) maintain consistency even with discontinuous and fast movements

While it is not the goal of this paper to present in detail the type of descriptions performed for each of the seven morphological qualities of sounds, it is worth noticing that the vocabulary used for the description of harmonic timbre converged in the semantic region of visual perception, while the vocabulary used for the grain converged in the semantic region of tactile perception, revealing the limitations of the phenomenological method. By the end of this phase, the students had gained sufficient control of reduced listening to be able to associate the impression produced by a sound to its acoustical qualities by producing detailed and structured descriptions of its behaviours in the four dimensions.

Phase 4: Intersubjective variation

A phase of intersubjective verification closed the students' study of sound objects. It consisted of an experiment based on a selection of 30 sounds, with one sound randomly assigned to each participant who would be responsible for producing its description. The descriptions were then collected and shared within the entire group in which students were challenged to pair each description to a sound it was intended to represent. The process was highly interactive, involving multiple acts of auditory scrutiny of each sound, and a return to epoché as a means to reframe the attention. One of the primary objectives of this phase was to make the participants aware of their listening capabilities and to lead them to the understanding that the actual existence of the sound object is entirely dependent upon their intention. The correlated objective was to give the students a consistent vocabulary to describe and analyse sound objects, and to help them engage in a rigorous practice of listening.

The use of a phenomenological approach allowed us to create an educational process in which the necessary theoretical components of acoustics and psycho-acoustics were not pre-defined and given but instead arose from students' consistent practice and became anchored in their consciousness.

The use of Temporal Semiotic Units (TSUs) in moving from Sound Objects to sonic structures:

At this stage of the study, students were confident with their capacity to identify, describe, and discuss qualities of isolated sound objects. They were able to use this expertise to differentiate and characterize sound objects on the basis of their morphological properties. During the next stage of the study, we focused on extending this expertise to the exploration of what we called *forms of forms*, or meaningful organizations of sound objects with the goal to understand not only the role of morphological properties in the formation of meanings and in the structuring of the listening experience, but also the active role of directed intentionality in this process. The system of Temporal Semiotic Units (TSUs) was particularly well suited for this extension of the scope of our study precisely because the researchers and composers of the laboratory *Musique et Informatique de Marseille* (MIM) had designed this system with such a goal in mind.

Temporal Semiotic Units (TSUs) form a system of musical analysis based on the identification of temporal meaning associated to musical segments. This system has been developed by researchers and composers of the laboratory *Musique et Informatique de Marseille* (MIM) in order to address the meaning of musical segments and their role in musical structures. Unlike the sound objects strictly defined according to their morphological properties within the framework of reduced listening, TSUs are defined according to the kinetic interpretation of their temporal behaviours: "TSUs are sound forms which convey meaning through their dynamic pattern over time"[8]. They consist in a system of description of musical content, by which the stream is experienced as a succession of units, each of them associated with a sensation of movement. At the moment, this system comprises 19 units each of them referring to a specific sense of movement such as, *Waves, Falling, Moving Forward, Spinning, Stretching…*

The series of experiments conducted in class with the TSUs aimed at developing the students' understanding of musical and sonic structures and the relationships between objects and structures. The methodology guiding these experiments is phenomenological as it seeks the emergence of values and meanings from the critical exploration of individual listening experiences. Similarly with the first experiments with the sound object, students placed their listening activities within the frame of *suspended judgment* and reduced their intentionality to the identification to of the unity of the temporal auditory object. They had acquired experience and confidence in this practice applied to individual sounds. They had integrated it as the premise of a renewed interaction with auditory objects in which these objects are revealed as new forms and a consequence of this interaction. The difficulty presented here is the temporal span of this interaction that has to be extended over the duration of an entire piece of music.

To overcome the challenge presented by temporal span and to teach participants to maintain attention and consistency of intentionality over longer duration, the first experiment used Anton Webern's *Three Short Pieces: Opus11* and progressively extended the duration of the practice of epoché to several minutes. From this practice, students were able to reveal a piece of music as a *form of forms*, flowing in synchrony with their consciousness. One of the emerging experiential structures resulting from this phase was a transformation of the mental representation of the continuity of music from a succession of distinct events connected by external principles to a unified experience of episodes hierarchically organized and nested within one another. Within this unitary flow of the piece of music emerging from the primary intentional act of perception, subordinate events can be differentiated on the basis of their functional contribution to the sustainability of unity.

The unified experience of episodes hierarchically organized and nested within one another identified in this process is in many points similar to the ecological flow of events opposed by James Gibson to the conceptual time conceived as a series of successive events[9]. Within this framework, and within the phenomenological perspective a form of forms, is perceived as a whole even before the perception of the entirety of its structural components. The sense of the form is not delivered retroactively, after the perception reaches the last structural component. Instead, it emerges continuously and supports the differentiation and identification of all the structural components, events, episodes or forms.
Once the episodes had been identified from this hierarchical perspective, the group engaged in a collective process to describe concurrently the acoustic qualities of the episode and the characteristics of the perceived movement. This experiment produced a set of morphological and semantic descriptions addressing such questions as:

- In what dimension of the sound is the movement happening?
- Onto what quality of the sound is the sensation of a particular movement applied?
- Is the movement of progressive extinction perceived through manifestations in different domains such as mass, gait, or dynamic profile?

This aspect of the study was crucial as it allowed bringing back the previously established qualities of the sound object and connecting them to structural functionalities. The intentional act of listening initially applied to short sound objects was thus extended to music, allowing students to understand their role in the elaboration of music structures and in the emergence of musical meaning. At this stage, students were engaged in a meaningful interaction with music that is best described by Eric Clarke as the "awareness of meaning arising while listening to music"[10]. Final steps in the lesson focused upon intersubjective verification and led to two summary experiments.

In the first summary experiment, students worked on the convergence of their descriptions with the descriptions of the 19 TSUs. These convergent descriptions are available in the appendix.

Afterward, they listened to the set of typical audio examples of TSUs produced by the laboratory Musique et Informatique de Marseille (MIM) and had to match these examples with the descriptions. For each category of TSU (19), four musical examples were provided. With the exceptions of some ambiguous cases, students were successfully able to group the four examples corresponding to a category of TSU and to match this group with its description.

In the second summary experiment students analysed a musical sequence using TSUs, supported by the documents, examples, and descriptions they had collectively established. This experiment was collective, and its outcome was compared to the analyses of the same piece produced by researchers from the MIM. While there were some divergences in the identification and naming of some episodes, the segmentation was identical across participants. This part of the lesson had two positive outcomes: validation for the students who found their analysis equivalent to those produced by composers and music specialists, and for the creators of the TSUs system who gained evidence revealing a measure of universality.

The use of a phenomenological method in pedagogical design was inspired by two main motivations:

1. The high level of technological skills required today in the professional practice of audiovisual technologies has diverted the attention from what should be at the centre of any creative activity in this field: our relationships with sounds and music.

2. The constant search for efficiency in education tends to focus on fast delivery of technical skills, leaving little or no time for educational processes dedicated to fostering awareness that individuals are in control of their creative and communicational capacities.

This lesson in the study of sound objects successfully contributed to the realization by students of their active role in the perception and understanding of auditory contents.

The subjective approach to listening used in this study opened paths for comparison, appropriations, translations and consistent descriptions. Students were able to see that they could become experts of their own listening. From this perspective, they gained the ability to integrate subjective variations of interpretations in their own design of auditory products. Perhaps more importantly, they became active contributors in their own educational process and contributed to greater understanding of this experience for teacher/researchers. It is expected that this description of a phenomenological, acousmatic approach to teaching sound design could inspire others to engage in teaching the various techniques used to generate digital objects such as images, virtual environments, or games with the goal to progressively develop a consistent educational framework for these disciplines supported by an ecological and phenomenological approach to the perception and understanding of these digital objects.

Appendix

19 Temporal Semiotic Units (TSUs) – with semantic and morphologic descriptions

1. ***Falling:*** suspension at a zenith with a rapid downward movement of pitch.
Semantic Description: abruptly interrupted unstable balance. Suspension then swing. The acknowledgment of the suspension is delayed.
Morphologic Description: Limited in time.
Phase 1: uniform with an internal movement of suspension
Phase 2: acceleration and evolution in pitch.

2. ***Expansion:*** a push or pull outward creating a wider sound space.
Semantic Description: Conveys the feeling of moving towards the maximum of a process. Feeling of expectation. Two contradictory forces creating the feeling of an increasing tension.
Morphologic Description: Limited in time.
Phase 1: constant increase of one of the parameters of the matter of the cell.

3. ***Slowing:*** deceleration of movement in any given direction.
Semantic Description: feeling of a movement's forward progressively (but rapidly) pulled to a stop.
Morphologic Description: Limited in time.
Phase 1: two opposite profiles (successive or simultaneous). Something going forward and something pulling back.

4. ***Waves:*** undulating movement of crests and troughs in a cyclical pattern.
Semantic Description: each cycle conveys the feeling of being pushed forward with a decreasing energy. The general feeling is that of steadiness.
Morphologic Description: Unlimited in time. Repetition of a delta pattern increase/decrease of energy. The delta pattern can apply to various parameters (pitch, intensity, mass…). Slow to moderate tempo.

5. ***Inertial:*** scattered sounds attempting to initiate full motion.
Semantic Description: sounds like something trying to begin a motion.
Morphologic Description: Unlimited in time.
Phase 1: a short articulated form.
Phase 2: an opposition to Phase 1; can be a suspension, a silence, or a holdback.

6. ***Endless:*** a constantly extending trajectory that never ceases.
Semantic Description: trajectory conveying the feeling that it could extend forever.
Morphologic Description: Unlimited in time.
Phase: a trajectory performed by one or several parameters of sound is heard (pitch, intensity, mass) with the feeling of an energy constantly renewed.

7. ***Chaotic:*** constant, confusing motion and excessive sounds.
Semantic Description: General feeling of confusion; ensemble with a high internal mobility but without a general direction.

Morphologic Description: Unlimited in time; high density of multiple events, contradictory and possibly simultaneous.

8. ***Compressive Expansion Explosion:*** uneven compression of sound followed by a uniform crescendo.
Semantic Description: Feeling of compression at first then release of the energy, going from local energy to diffused energy.
Morphologic Description: Limited in time.
Phase 1: discontinuous and uneven matter.
Phase 2: uniform with a crescendo.

9: ***Floating:*** light and airy movement with no apparent pattern.
Semantic Description: Temporal continuum with no feeling of expectation
Morphologic Description: Unlimited in time. Slow tempo. Discrete sonic events displayed with no perceivable structure on a smooth continuum.

10: ***Heaviness:*** slow, accented movement in opposition to faster motion.
Semantic Description: conveys the feeling of a difficulty to go forward.
Morphologic Description: Unlimited in time. Repeated cell of a non-strictly identical pattern. The repetition has a controlled dissymmetry. There is an accent or a crescendo at the beginning of each repetition of the cell. Each accent renews the kinetic energy of the motion. The tempo is slow to moderate.

11. ***Propulsion:*** sound that pushes or pulls forward.
Semantic Description: feeling of being regularly pulled forward.
Morphologic Description: Unlimited in time.
Phase: unit with a constantly renewed energy and a direction. Constituted of one phase repeated with no interruption and containing an accent.

12: ***Conclusive:*** predictable end to the energy of sound.
Semantic Description: entirely predictable natural end of a movement.
Morphologic Description: Limited in time.
Phase: progressive and regular decrease of the energy.

13: ***Hesitative:*** interruption in movement.
Semantic Description: interrupted movement.
Morphologic Description: Limited in time.
Phase 1: short, varied and repeated cell evolving in one direction.
Phase 2: contrasting with the first phase, decrescendo or silence.

14: ***Entropic:*** opposite of chaotic; divergence of information that implies motion, but with immobility.
Semantic Description: feeling of a general immobility conveyed by successive contradictory directions.
Morphologic Description: Unlimited in time and made of short moments reflecting contradictory organizational systems. The contradictory directions are successive and not simultaneous. The general energy remains potential (not used in one movement).

15: ***Accumulative:*** swelling and storage of energy prior to impulse of motion.
Semantic Description: the gathering of the energy prior to the motion.
Morphologic Description: Limited in time.
Phase 1: the gathering. Concentration.
Phase 2: the very first instant of the movement. One direction.

16: ***Suspended:*** hanging in expectation of an unknown but impending movement.
Semantic Description: Feeling of hesitating, awaiting. Expectation of something to happen without knowing what or when.
Morphologic Description: Unlimited in time. Repetition of a cell on a slow tempo with no variation and very little evolution.

17: ***Obsessive:*** persistent repetition that continues the energy of motion.
Semantic Description: Persistent, autonomous repetition. Each repetition renews the energy.
Morphologic Description: Unlimited in time. One phase in each repetition. Unit with a direction (orientation) containing one cell (phase) repeated in a pulsated time.

18: ***Spinning:*** constant, animated turning.
Semantic Description: conveys the feeling of an animated, spinning or turning object.
Morphologic Description: Unlimited in time. Continuous repetition of a cell with a general "delta" pattern i.e. a crescendo-decrescendo with an accent at the apex of the crescendo. This pattern can be asymmetrical (the crescendo can be shorter than the decrescendo).

19: ***Stationary:*** constant, but directionless and purposeless.
Semantic Description: feeling of continuity. No expectation. Something is happening but goes nowhere.
Morphologic Description: Unlimited in time. Slow tempo. Regularity and permanence.

Footnotes

1. Schaeffer, Pierre. Traité des Objets Musicaux. Paris: Édition du Seuil, 1966.
2. Kane, Brian. “L’Objet Sonore Maintenant: Pierre Schaeffer, sound objects, and the phenomenological reduction.” Organised Sound (Cambridge University Press) 12, no. 1 (04 2007): 15-24
3. Moran, Dermot. Introduction to Phenomenology. New York: Routledge, 2000.
4. Schaeffer, Pierre. 1966. p.92
5. Moustakas, Clark. Phenomenological Research Method. Thousand Oaks, CA: Sage Publication , 1994. p. 20
6. Husserl, Edmund. Ideas Pertaining to a Pure Phenomenology and to a Phenomenological Philosophy . Translated by F Kersten. Boston, MA: Martinus Nijhoff Publihsers, 1983. p.195
7. Schaeffer, Pierre. 1966. p.196
8. Hautbois, Xavier. 2013. “Temporal Semiotic Units”. In La Recherche au MIM. Marseille,
9. Laboratoire Musique et Informatique de Marseille.
10. Gibson, James. The ecological Approach to Visual Perception. Hillsdale, NJ: LawrenceErlbaum Associates, Inc, 1979. P.102
11. Clarke, Eric. Ways of Listening: An ecological Approach to the Perception of Musical Meaning. Oxford, NY: Oxford University Press, 2005.

References

Clarke, Eric. 2005. *Ways of Listening: An Ecological Approach to the Perception of Music*. Oxford: Oxford University Press.

Delalande, François. 1996. “Les Unités Sémiotiques Temporelles: Problématique et essai de définition.” In *Les Unités Sémiotiques Temporelles: éléments nouveaux d'analyse musicale*, by Laboratoire Musique et Informatique de Marseille, 16-25. Marseille: Laboratoire Musique et Informatique de Marseille.

Demers, Joanna. 2010. *Listening Through the Noise: The Aesthetics of Experimental Electronic Music*. New York: Oxford University Press.

Dufour, Frank. 2008. ""“Musique Concrète” as one of the Preliminary Steps to Acoustic Ecology." *Soundscape* 8: 1:: 17-20.

Gallagher, Shaun, and Dan Zahavi. 2012. *The Phenomenological Mind*. New York, NY: Routledge, 2012.

Gibson, James. 1979. *The Ecological Approach to Visual Perception*. Hillsdale, NJ: LawrenceErlbaum Associates, Inc.

Gibson, James. 1966. *The Senses Considered as Perceptual Systems*. Westport, CT: Greenwood Press.

Hautbois, Xavier. 2013. “Temporal Semiotic Units”. In *La Recherche au MIM*. Marseille, Laboratoire Musique et Informatique de Marseille.

Husserl, Edmund. 1983. *Ideas Pertaining to a Pure Phenomenology and to a Phenomenological Philosophy*. Translated by F Kersten. Boston, MA: Martinus Nijhoff Publishers.

Ihde, Don. 2007. *Listening and Voice: Phenomenologies of Sound. 2nd ed.* . Albany, NY: SUNY Press.

Kane, Brian. 2007. "L'Objet Sonore Maintenant: Pierre Schaeffer, Sound Objects, and the Phenomenological Reduction." *Organised Sound* (Cambridge University Press) 12:1: 15-24.
Laboratoire Musique et Informatique de Marseille. 1996. *Les Unités Sémiotiques Temporelles : Éléments Nouveaux d'Analyse Musicale*. Marseille. Musurgia
Landy, Leigh. 2007. *Understanding the Art of Sound Organization*. Cambridge, MA: The MIT Press.
Moran, Dermot. 2000. *Introduction to Phenomenology*. New York: Routledge.
Moustakas, Clark. 1994. *Phenomenological Research Method*. Thousand Oaks, CA: Sage Publication.
Nancy, Jean-Luc. *Listening*. 2007. Translated by Charlotte Mandell. New York: Fordham University Press.
Palombini, Carlos Vicente de Lima.1993. *Pierre Schaeffers typo-morphology of sonic objects*. Doctoral thesis, Durham University. Available at Durham E-Theses Online: http://etheses.dur.ac.uk/1191/
Schaeffer, Pierre. 1966. *Traité des Objets Musicaux*. Paris: Édition du Seuil.
Schafer, Murray. 1969. *The New Soundscape*. Scarborough, Ontario: Berandol Music..
Schafer, Murray. 1977. *The Tuning of the World*. New York: Knopf.
Truax, Barry. 1984. *Acoustic Communication*. Westport, CT: Ablex.

Bio

Frank Dufour is a professor in the school of Arts, Technology, and Emerging communication at the University of Texas at Dallas where he teaches sound design and aesthetics of interactive arts. His research is primarily dedicated to the perception of sound and music from a phenomenological perspective. Frank Dufour is a member of the laboratory Musique et Informatique de Marseille (MIM) in which he works on the use of the system of the Temporal Semiotic Units to develop visualizations of music. As an artist, he works with the independent art laboratory, Agence5970 on interactive audiovisual installations.
http://agence5970.com/frank-dufour
http://www.utdallas.edu/atec/artstechnology/dufour/

Curating Aural Experience: A Sonic Ethnography of Everyday Media Practices

By Dr. Milena Droumeva

Abstract

In less than a decade, the cell phone's transformation from a tool for mobile telephony into a multimodal, computational 'smart' media device has engendered a new kind of emplacement and ubiquity of technological mediation into urban everyday life. This technological mediation is increasingly integrated into and co-constitutive of the very fabric of everyday experience and perception ranging from sensorial encounters with physical space to the enactment of epistemological and social practices. Leveraging a small ethnographic study in which participants used an iPod Touch to generate a series of personal media documentaries about their everyday sonic experience, this paper identifies the act of generating media artefacts is an act of mediated curation: it stages everyday life as content; it reconfigures perceptual practices, and frames patterns of mediated communication. Adopting the metaphor of curation re-frames traditional notions of aesthetic sensibility through concepts such as the 'photographer's eye' and the 'recordist's ear' as they historically transcend the realm of specialized expertise and become the purview of general everyday practice. In that, the boundary between art and documentation is thinly compressed into the simultaneously creative and epistemological act of curating everyday experience through the aesthetic politics of the smartphone. As a sonic ethnography, this study offers a unique model of doing research with technology that is rooted in a sensory approach to subjective experience and the performance of cultural practices.

Keywords

multimodal ethnography, field recording, mobile technology, new media, sound studies, curation, acoustic ecology

The senses in the social multiverse

Visions of technology increasingly engulfing us into a cyborg existence of half-biological, half-technological materiality (Haraway, 1985, Stone, 1995, Dyson, 2009), have long furnished science fiction imaginings and fascinated scholars of the digital humanities. While holodecks and warp drive may as yet remain fiction, it could be said that a much more subtle technological (r)-evolution is at work: one that is indeed re-configuring our bodies, senses, and surroundings, and is instrumental to our construction of meaning in the course of everyday life. Amidst the vast array of media forms to emerge over the last century, as well as the multitude of technological developments in communication and computing, the personal 'smart' device (or smartphone) represents a particular convergence of multimodal possibilities for public and private communication. This kind of technological mediation is increasingly integrated into and co-constitutive of the very fabric of everyday experience ranging from sensorial encounters with physical space to the enactment of epistemological and social practices in the course of cultural participation. Cultural media studies have for

some time now concerned themselves with political economy, identity politics and 'reading' media as cultural texts, however, a new 'sensory' turn in the social sciences has en-livened such investigations, grounding them in both cultural and perceptual enactments of a wider new media ecology, located in the sphere of everyday life. Within this emergent conversation, visual culture still takes precedence, framing the discourse around media and the senses in somewhat occularcentric ways. This is precisely where considering other registers of experience such as the auditory, tactile and olfactory can enrich both conceptualizations of media and assumptions about everyday use of technology (Sterne, 2003; Bull & Beck, 2003; Kozel, 2007; Henshaw, 2013) and within these areas I consider specifically mobile aural practices.

While everyday capturing of audio material is not quite as widespread a cultural practice as everyday photography relative to the camera phone (Daisuke & Ito, 2003), current trends indicate a movement in the direction of increasingly multi-sensory capturing and sharing (Hamburger, 2014). In the time since its release in January of 2013, the Twitter social video application Vine, which brings sound and moving image together, made news by topping the mobile app charts with 3.6 million new users in the first 2 months alone (Weissman, 2013). Its success margin precipitated Instagram – one of the fastest growing photography-based social media networks – to introduce its own video module featuring its iconic photo filters: since its release in June 2013, Instagram video has generated over 130 million users and according to Neomobile Research (2013), projections based on current trends indicate that by the year 2017 two-thirds of all mobile data traffic will be video – that is, image and sound. At the same time, media analysts herald the race for an 'Instagram for audio' application that brings to the fore growing online social networks such as Soundcloud and Audioboom. Given these trends towards multisensory capturing that include both 'seeing' and 'hearing' with portable digital technologies, the focus on listening in this project serves to simultaneously delimit the ethnographic entry point at the sensory level, as well as harness the unique phenomenological possibilities that sound opens up, and take advantage of a wealth of literature that explores the auditory dimension of cultural production (Erlmann, 2004; Bull & Back, 2003; Sterne, 2012; Bijsterveld, 2013). As such, this work aims to bring an ethnographic perspective to the exploration of sensory experience situated in the sphere of everyday life – the ordinary 'praxis' of inhabiting a cultural space. It does so with reference both to 'routine' lived experience and to contemporary technological and media practices, which may be seen as "crystallizations of social relations" and learned sensory techniques (Bourdieu, 1981; Sterne, 2003). In other words, I ask, what can we learn about everyday experience, mediated communication and urban life by examining the way people listen with mobile technology?

Sonic Ethnographies: lessons from the field

Field recording, sometimes referred to as phonography (Drever, 2002), involves the capturing of 'found' soundscapes and other ambient research setting that may include but are not entirely focused on language the way for instance audiotaping interviews is a well-established form of collecting ethnographic data (Lane & Carlyle, 2013; Makagon & Neumann, 2009). Early cultural anthropologists such as Malinowski (1979) and Stoller (1997) routinely used audio recording technologies to document ethnographic

observations in the field (Makagon & Neumann, 2009; Sterne, 2003). Two of the more significant works in the history of contemporary sonic ethnographies include Steven Feld's (1993) exploration of the Bosavi forest in Papa New Guinea and R.M. Schafer's World Soundscape Project (WSP, 1973), which propelled the area of acoustic ecology as an international environmental and educational movement. Steven Feld's ethnomusicology offers a rich model for adopting sonic ethnography as an articulated methodology beyond its being an alternative form of data collection. Feld describes his practice of ethnomusicology as an ethnography whereby a researcher could maintain "a creative and analytic relationship to both the materiality and the sociality of sound" (Feld & Brennis, 2004, p.462). The WSP focuses extensively on listener experience and on the soundscape as both a material and a social ecology intimately connected to a sense of place, and does so through a normative ecological rubric. The WSP (1973) pioneered a number of innovative methods for collecting, analyzing and engaging with sonic content such as soundmaps, diaries, audio graphs, and soundscape composition.

More recent urban sonic ethnographies that are inspired by the acoustic ecology movement include the Finnish project One Hundred Finnish Soundscapes and several related initiatives (Kautonen & Koivumäki, 2010); the follow-up study Acoustic Environments in Change (Järviluoma et al., 2009); among many others. Uimonen (2010) in particular has discussed the use of social media and affordable consumer equipment as catalyst forces for engaging the public in soundscape conservation projects. Yet in many of these projects the precise nature of what is meant by 'listening,' subjectivity, and aural attention remain unproblematized, particularly in relation to the process of recording. One of the key methodological contributions of acoustic ecology and Truax's subsequent acoustic communication model (1984), is the concept of soundscape competence – a term that designates the kind of tacit knowledge that we mobilize towards listening in everyday life. It includes a perceptual understanding of sound's physical characteristics (estimating distance and general acoustics of space), as well as a culturally-informed approach to interpreting the meaning and significance of individual sounds within a wider sonic environment (Truax, 1984). Soundscape competence is thus a function of culture as much as it is a perceptual ability, and combined with the sort of 'audile techniques,' (Sterne, 2003) arguably engendered through the use of mobile technologies, it encompasses both mediated and unmediated forms of listening. Despite the moniker of 'competence,' which implies a normative ideal for a 'better' kind of listening, I take soundscape competence to represent a more agnostic characterization of aural attention: listening approaches and strategies that emerge in specific geographic and cultural contexts. For instance, the typical urban strategy of tuning out incessant traffic noise can be said to be an extension of soundscape competence (a protective mechanism really) resulting from the cultural conditioning of living in an urban environment.

Methodologically, the manner of accessing 'listening' is a necessary step in investigating the aural experiences of typical urban listeners. Soundscape ethnographies such as many of the initiatives undertaken by Uimonen (2010, 2011) or Järviluoma et al. (2009) incorporate guided soundwalking, audio recording and simultaneous interviews with participants. The ensuing limitations, given the Finnish studies are typically modeled after the WSP, are that they directly espouse acoustic ecology's ideals of raising awareness about the soundscape as an end in itself, rather than as a

means towards researching other aspects of culture and social life. This is demonstrated through a focus on identifying 'significant' sounds that characterize a community, and a tendency to focus on ear-witness archetypes such as the 'long-term resident' or the 'newcomer' (Kautonen & Koivumäki, 2010). Rather than approaching the dynamics of aural experience as it happens in the flow of everyday life, these projects embrace an agenda of soundscape conservation at the onset; further, it is the researchers who control the recording equipment and by extension, the analytical focus. In contrast, emergent research projects in sound studies not only utilize accessible mobile technology, but also employ participatory, artistic and interventionist methodologies towards the exploration of urban space (O'Keeffe, 2015; Radicchi, 2010; Fërnstrom & Taylor, 2014). Along these lines, I wanted to have participants in my study make their own decisions about what, how, when and where to capture sound. I also wanted to understand the relationship between their everyday technological use and their practice of attentive listening; I wanted to allow participants to develop recording and listening practices over a period of time; and finally, I wanted to create an opportunity for a creative, transformative and reflective engagement with soundscapes. There are several operational assumptions that help situate this inquiry in terms of integral features of listening, mobile technology use, and participatory culture.

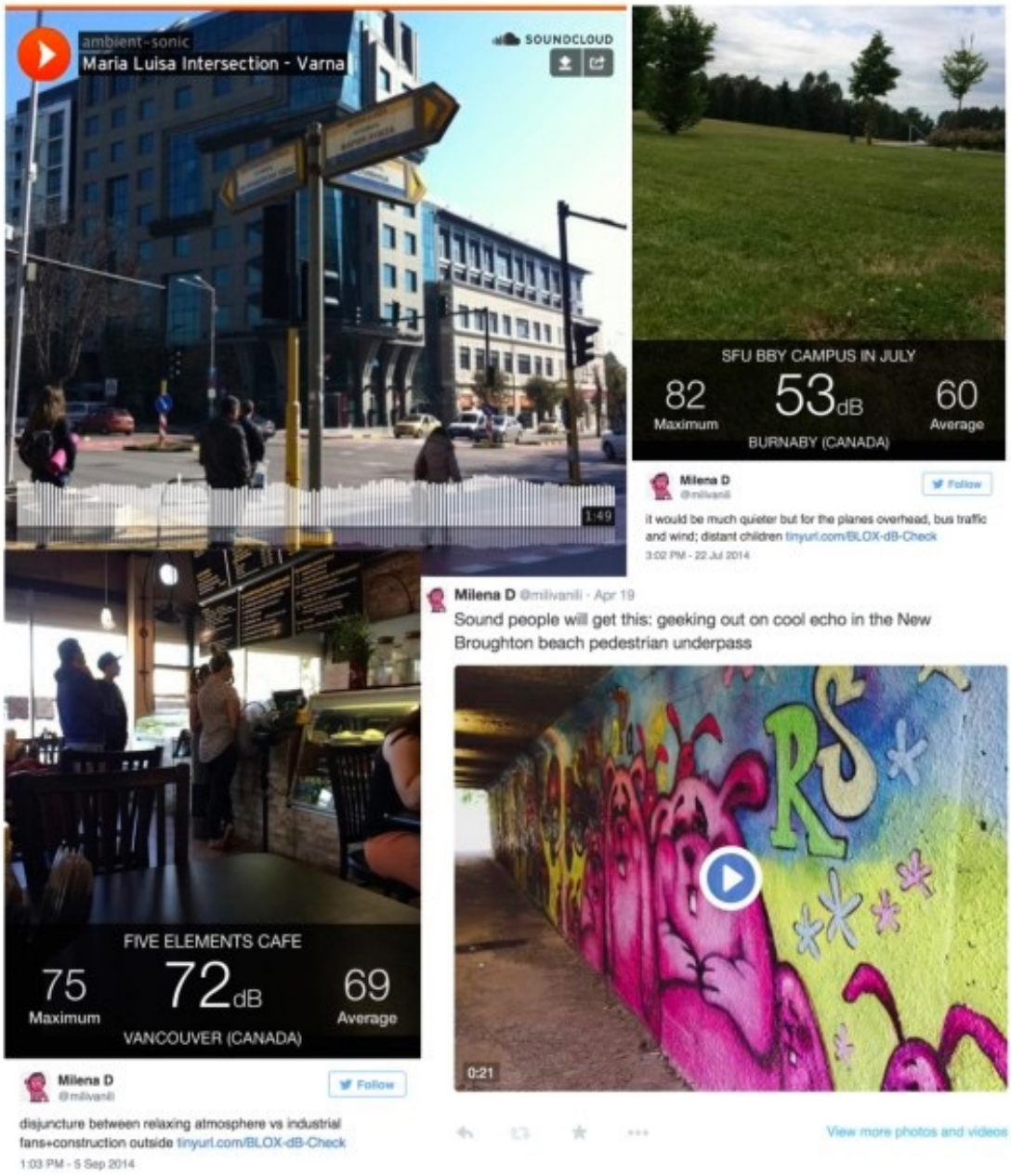
- **Everyday listening as a problematic** – listening is a particular way of making sense of everyday experience, a particular way of paying attention, and the soundscape is an active element in orienting us both with regard to place and in our social relations with others (Feld, 1993; Schafer, 1977; Norman, 2012).
- **Recording media as an everyday practice** – communicating about everyday experience through media representations is a particular feature of new media culture and is instrumentally supported by the emplacement, ubiquity and portability of smart technologies in everyday life (Squire, 2009; Ito et al., 2010).
- **A technocultural problematic** – producing media artefacts as a way of engaging with and framing sensory experience engenders a mobilization of digital literacies and new media competence; understanding these requires recognizing each participant's approach to media production (Jenkins et al., 2006; Burn, 2009).

With these themes, the question at hand became: *how does listening with and through mobile technology re-mediate people's access and understanding of their own everyday life?*

The Everyday Listening Project: a case study

The case study for this project involved eight people (two groups of four) as participant-informants who were asked to listen with an iPod Touch for the duration of two weeks and capture daily 'aural postcards' of their everyday sonic experience, followed by group discussions. The prescribed format of aural postcards (Tonkiss, 2003) is somewhat analogous to the WSP's use of 'sound diaries' (1973), however, while sound diaries are largely textual and imply a record for internal reference, a postcard connotes

a style and format of representation similar to an 'audio tweet' aimed both at expressing oneself and communicating externally. Framing each moment as a multimodal 'flashcard' captures not only the entry point into sensory experience as a moment in time, but also the convergence of representational modes used to communicate about that experience. While an aural postcard might seem like an oxymoron given sound's temporal nature, the cultural connotations of a postcard align perfectly with the way mobile device users create digital archives. Aural postcards, as I conceptualize them here serve as audio souvenirs referencing phenomenal experience, simultaneously a copy and a version of the 'original' experience. An aural postcard is a story about a particular sound or soundscape and it can contain one or multiple media artefacts, reflection in spoken or written form, a drawing, a map, or data (figure 1).



Audio player

Figure 1. Examples of aural postcards made by the researcher in various formats.

The tools that participants had at their disposal included the Recorder app for audio-only recording; the iOS built-in camera and video applications; Faber Acoustical's dB: a sound level measurement application which allows an overlay of decibel levels onto a still photograph of the environment; a suite of RTA (Real Time Analysis) audio tools; all the built-in iOS apps including Safari and social media apps for web access (in order to engender a 'realistic' everyday use of the device). Given the versatility of the tools and each person's unique relationship to everyday media production, participants

developed specific subjective approaches to capturing everyday soundscapes. The study was intentionally open ended as to the content of the aural postcards and the formats of capture, resulting in over 250 audio files and over 150 photos and videos. Durations of recordings varied from under a minute to over two hours. Some aural postcards included a set of different recordings – both visual and aural; other postcards comprised of a single recording or photograph. While the overall 'methodologies' for capturing everyday soundscapes were highly individualized across participants (figure 2, left), everyone adopted a combination of several media formats that I've categorized based on frequency of occurrence and shared format properties: the sonic highlight – a short vignette of a given soundscape with minimal or no introduction or voice-over; the process recording – the entire duration of an unfolding event; the live commentary – marked by voice-over on location; and the voice memo – a dedicated verbal reflection before or (typically) after a sound event. In addition, a number of participants also used the sound level meter app, which allowed them to generate a visual record of the sonic levels of a given environment or location in the form of a sound level photograph. Interestingly, typical soundscape settings featured in each participant's digital archive also constituted an individualized combination of several archetypal everyday spaces (figure 2, right). Furthermore, the more dominant a particular routine was in a person's life, the more purposefully they explored it sonically as part of this study (e.g. one participant who just moved apartments used the study to map out the sonic environments of her new building). Essentially, mediated listening served as an operational entry point into understanding and connecting with familiar or otherwise significant spaces, routines and ambiences in a novel and exploratory way.

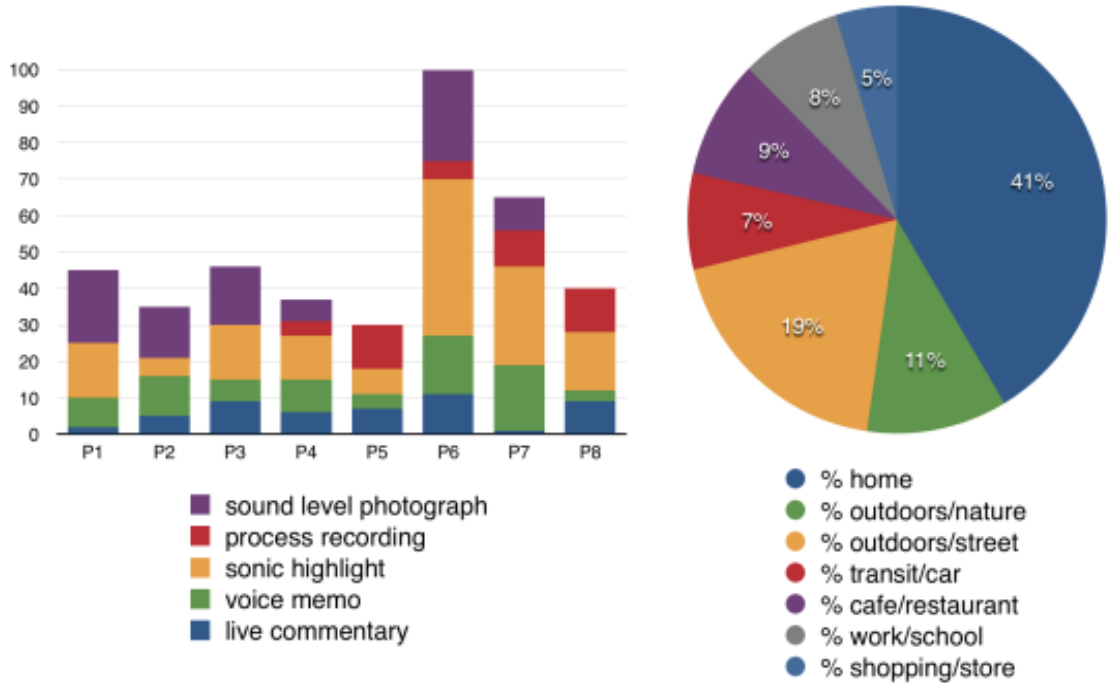


Figure 2. (left) Number and type of media artefact per participant (1-8). (right) Breakdown of featured soundscape settings (average across participants)

Considering each participant's contribution as a mini-investigation through the process of a sonic auto-ethnography, the structuring and choices around recording settings and content reveal unique perspectives about everyday life and relationships to everyday practice. Particularly striking was the contrast between representations of sonic experience as a temporally continuous flow (process recordings) versus everyday life as snapshot impressions, and 'samples' of sound (sonic highlights). Each aural postcard is in this way a particular mediated representation of an everyday experience, in the course of which new perspectives and listening experiences are elicited. 'Reading' the content of aural postcards through their respective documentary iterations reveals an always-present interplay between pre-existing ideas about what it is that participants intended to capture, and reflections that arise out of the mediated sensory experience of capturing. The next section attempts to address some of these interplays as listening intersections, remediated through the format of the device.

Listening intersections in mediated aural practices

Revisiting already theoretically established links between sound, place and memory (Feld, 1993; McCartney, 2010) in relation to metaphors for understanding everyday life – as practice, place, movements and flow (Pink, 2012) – formed a starting point for mapping intersections that characterize aural postcards as listening encounters. Examining voice memos as intentionally reflexive accounts, I began to see several types of potential convergences between the 'actuality' of sensory experience and elements of its mediated representation. For instance, the featured sound was most often narratively associated with these three aspects: a place, a daily practice or the participant's identity. While reflections related to oneself often included voice memos, representations of places or routines consisted predominantly of non-narrated ambient recordings. Where postcards featured a specific everyday practice, sound was discursively incidental to the message conveyed, serving to illustrate and give 'life' to the activity at hand. I want to demonstrate these ideas with several aural postcards that present similar but slightly different 'pathways' or listening intersections, connecting in a really personal way each participant's daily routine with their sense of identity and place. "Starbucks patio" (figure 3) was recorded as a sound level photograph only (no audio recording) and discussed through a voice memo after the fact. This participant generally took a very systematic approach to documenting sound levels, using that as a point of entry to discuss architectural acoustics in relation to his subjective impressions of local soundscape ecologies. What converges here is attentiveness to place and space through an increasingly discerning listening practice.

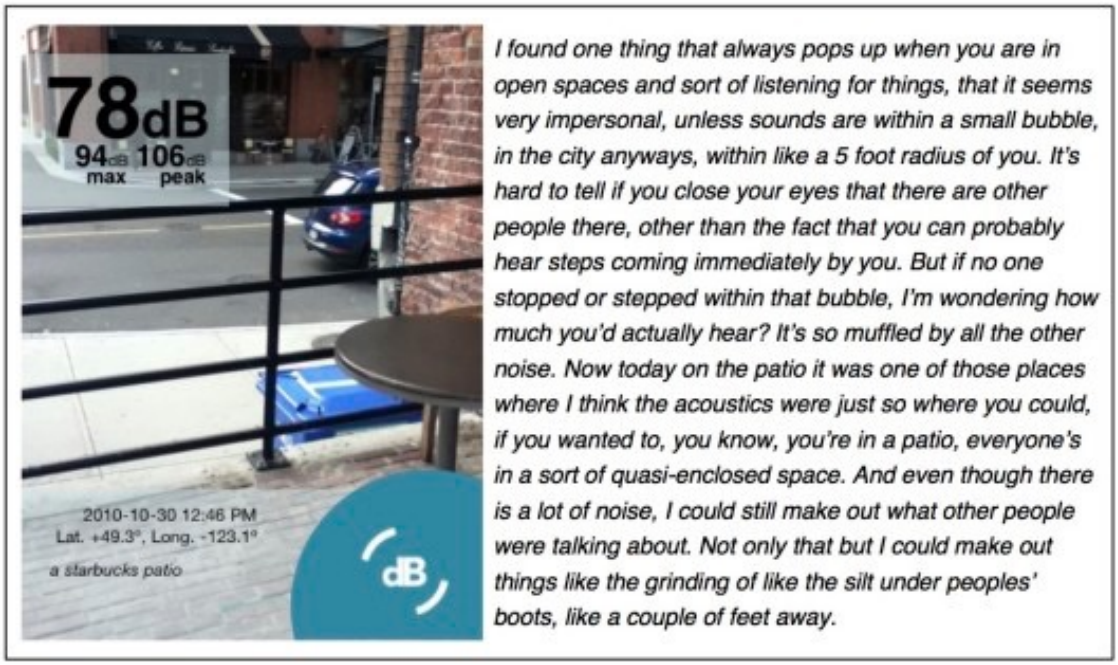


Figure 3 Aural postcard from a participant at Starbucks

The second aural postcard comes from a participant who mobilized the study to explore their new apartment and the building's soundscapes from a point of personal significance (figure 4). Many of the postcards, such as this one, directly invite the imagined listener to come along on a journey of discovery, typically recorded in the format of live (video) documentary of discrete domestic sound events and sonic spaces.

Figure 4. Listening intersections: “Gas light stove” (Participant 4 aural postcard transcript)

> *Okay here’s a sound that is new to me. Let’s see how this goes, Watch this. That’s amazing ’cause actually normally what happens when I try to use one the front burners on this range I get [clicking sound] this. It’s really frustrating so let’s see if we can repeat the magic. No, gas is dispersing. I guess it’s just from over-use but the front burners on this on this stove are really difficult to light so that clicking sound has become a pretty big part of my everyday experience. Um I’ll show you the back ones work though. [Clicking] look at that. I’ll see if I can get this one going. It’s kind of scary now that I listen to that.*

Finally, the third example comes from a participant who suffered a sports injury at the beginning of the study and ended up exploring her local soundscape while on medical leave. As part of her treatment for a concussion she had to take many evening walks and avoid exposure to screens, which resulted in being attentive to the many ambient industrial sounds emanating from a nearby shipyard and power station. The context of discovery here created a resetting of sensibilities towards sound that is typically tuned out, and capturing it marked a unique relationship to her recovery process.

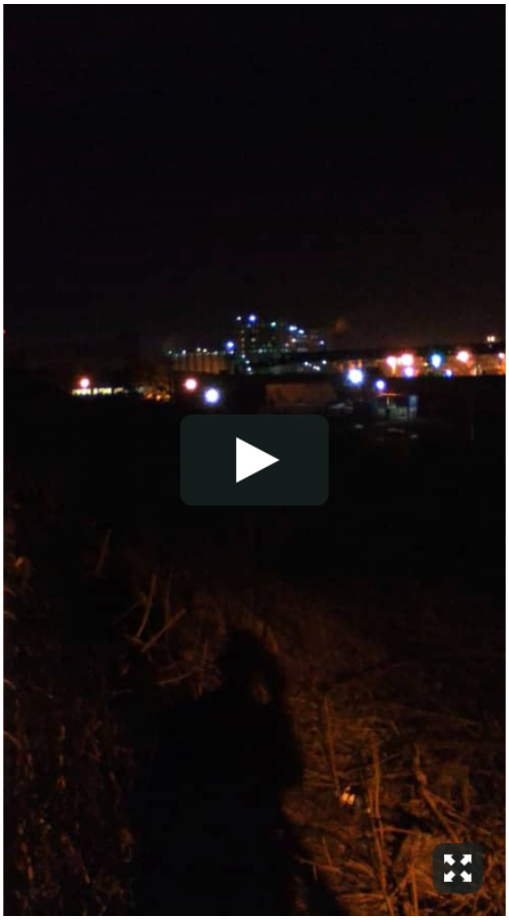


Figure 5. Listening intersections: "Walk on Wall Street at night" (Participant 8 – group discussion transcript)

> *Listening back [to my recordings], the noisiest stuff that we generally ignore on a regular basis is power, whether it's a vehicle or electricity or a plane. Listening to the soccer field you can hear the planes vividly, and listening to the quiet recording in my apartment you can hear the hot water and fridge and you can even hear some boats tugging in the port. Just it never ends, I think we just get used to that, noise as background noise, but it is definitely shocking to listen back in the recordings to find out just how much it overtakes the environment.*

Recording as a way of listening

What these intersections help illuminate, is the way in which recording with mobile technology, that is itself so emplaced in everyday life, mediates and actively constructs particular cultural performances of listening. Unmediated listening is of course already part of everyday life, but it is precisely the technological mediation of the iPod that allows the externalization of these experiences, eliciting a range of observations, sensations and reflections that might not otherwise occur. In other words, the stories that

we tell ourselves and others when encountering the world with and through mobile smart technologies are in part configured and even elicited by their use. The process of speaking to and producing for a disembodied and fragmented audience (neither entirely self, nor entirely other) offers a distinctive means for mediating one's own thoughts and impressions. In fact, in technologically documenting listening sound ceases to be central: the process becomes about what participants unlock and understand about themselves and their environment while attending to the soundscapes of their lives.
This returns us to the question of how recording sound engenders particular relationships with the aurality of spaces, places and routines of everyday life in ways that are different from, for instance, producing photographic memories for an image-based social network. What themes, impressions, discoveries and emotions arise as a result of giving prominence to listening? The listening intersections discussed in the previous section help us trace some of the inner workings of both primary aural experience and the layers of mediation that recording affords, making this a fruitful method for ethnographies that (increasingly) rely on collecting and representing digital media as 'data'. From this study I want to identify three aspects of mediated listening that warrant attention as specifically aural performances of engagement and inhabitation of urban environments: affect, or the way listening mobilizes emotional relationships to daily routine; residue, the sensory traces of experience retained through audio recordings; and presence, an enactment of listening subjectivity in the process of curating everyday experience. Affect, residue and presence characterize the way in which sound invites participants to inhabit a given environment, as well as the way in which mobile recording mediates the emotional context of everyday experience, through temporality and resonance. These three are not separate characteristics of listening, but convergent elements that help situate mobile sound recording as a particular cultural and sensory practice within new media culture.

Affect, Residue, Presence

Undoubtedly, the affective dimension of sound – how we feel about it – is a deeply ingrained aspect of listening as a form of sensory encounter. In the initial stages of the study I purposefully avoided framing discussions around 'pleasant' versus 'unpleasant' sounds, since this has the potential to derail a more comprehensive exploration of listening into the duality of 'likes' and 'dislikes.' Nevertheless, both the issues of noise and personal preference came up in all participant accounts. Affect and subjectivity were tightly entangled with the idea of 'attentive' listening itself, which translated to either being sensitive to unwanted and/or loud sound, or being able to pick out incidental 'cool and interesting sounds' from the surrounding environment. Interesting seemed, based on individual reflections and group discussions, to be the catch-all phrase for events, places, and practices worthy of recording both in terms of personal significance and for instrumental reasons: as a way of illustrating or communicating the general character of given soundscapes. In this sense, interesting also encompassed other symbolically meaningful properties of sound such as function, communicative and informational value.

Analogous to Daisuke and Ito's (2003) point that the camera phone constructs 'recording-worthy' content, the way technology mediated affective engagements in this study was that it allowed participants to explore a wide range of relationships to urban

settings through recording and capture. While some participants focused on the measurement of loudness through sound level photographs in an ostensibly 'objective' way, others focused on the emotional and connotative aspects of noise by way of sustained observation and reflection. The externalization of these relationships into particular media representations helped 'dramatize' and stage (Bijsterveld, 2013) the realities of urban noise, as well as each person's domestic soundscape and situate participants as embodied listening subjects. This way, the sensory residue accessed in the process of re-listening to one's archive of audio recordings facilitated unique discoveries and reflections and allowed participants to explore their emotional responses to sound (figure 5).

The sheer temporality of sound, accessed through a range of mediated formats (long vs. short recordings, decibel measurements, voice memos, videos) already disrupts the dominance of static forms of capture. Being present in space and time as a listening subject stands in contrast to the production of instantaneous photographic memories of the kind that permeate the social multiverse. Listening de-normalizes the normal of everyday life, by virtue of having to sit within the unfolding materiality of the aural, and stay present in the simultaneously physical, aesthetic and symbolic experience of listening (Droumeva, 2015). Despite some prominence given to noise, what participants reported as most engaging and transformative in the study was the re-discovery of a wide array of familiar and hitherto tacit everyday encounters with sounds that would often go unnoticed and unexamined: popping popcorn; the sound of wind; the soundscape of typing on a keyboard; the ambience of cafes and restaurants; the sound of making tea, etc. Attending to these soundscapes allowed participants to investigate their own attitudes towards everyday routines and reflect on them from a point of renewed significance. Here's how one participant framed her capturing experience:

> I basically thought about what I'll record in the beginning of the day realizing that almost everything I do has a sound to it that's interesting. And because my inclination is to do long recordings of a process, I was taking a snapshot of things that I do in my daily life as opposed to 'oh there's an interesting sound right now and I'm gonna grab it.' It's more about the process of things I do, like when I look back at my recordings and what I've named them I realize my life is crazy, like ridiculous, and I learned that – I guess I already knew that! (Participant 5, group discussion transcript)

Doing sensory studies with technology

Through this case study, I sought to deconstruct and then re-construct the process of mediated curation of sonic experience, in order to explore a model for doing sensory research with technology. Reflecting on the way I represent this work, it strikes me that its 'product' could easily be a performance, a storytelling circle, or an interactive web project, as much as a research pilot study meant to inform future work. To that end, the intersections between listening, everyday life and technology presented here constitute preliminary conclusions, connections and relationships that gesture at larger themes of technological mediation, embodied by the concepts of affect, residue and presence. Dealing with technology in this way – attending to both sensorial experience and its digital remediations as 'data' – opens space to consider not only the curation of

everyday experience through media representations, but also the analysis and presentation of research data as itself an act of curation. The mediational role of technology is key here as it facilitates particular aesthetic sensibilities and modes for communicating significance. A 'capture-able' moment is no more primary than it is digital: an ostensibly technological, cyborgian convergence of mediated materliality. This is not to say that mobile recording technologies have single-handedly changed the way we listen and attend to everyday experience; rather, they co-construct the manner of mediated representation, by which we make sense of the everyday. Our smart devices prompt us to frame sonic experience in a multimodal fashion – through the microphone, through the camera, and through the interactive possibilities of the social web – as curatorial decisions, related to the staging of recorded content. Emplaced in the singularity of each listening moment, multimodal capturing affords the retention of phenomenal residue through an evocation of sensory presence and emotional context. Framing phenomenal experience – in this case listening – is thus a core characteristic of a more general new media sensibility – the curation of everyday life.

References

Bijsterveld, K. (Ed.). (2013). *Soundscapes of the Urban Past: Staged Sound as Mediated Cultural Heritage*. Transcript-Verlag.

Bourdieu, P. (1981). Men and machines. In K. Knorr-Cetina & A. V. Cicourel (Eds.). *Advances in Social Theory and Methodology: Toward and Integration of Micro- and Macro-Sociologies* (pp. 304-17). Boston, MA: Routledge and Keagan Paul.

Bull, M. & L. Back (Eds.). (2003). *The Auditory Culture Reader*. Oxford: Berg.

Burn, A. (2009). *Making New Media: Creative Production and Digital Literacies*. New York, NY: Peter Lang Publishing

Daisuke, O. & Ito, M. (2003). Camera phones changing the definition of picture-worthy. *Japan Media Review*. Retrieved from http://www.ojr.org/japan/wireless/1062208524.php

Drever, J.L. (2002). Soundscape composition: the convergence of ethnography and acousmatic music. *Organised Sound,* 7(1), 21-27.

Droumeva, M. (2015). Why There Will Never be Instagram for Audio. Blog series. *Canadian Association for Sound Ecology* (CASE). http://www.soundecology.ca/

Dyson, F. (2009). *Sounding New Media: Immersion and Embodiment in the Arts and Culture*. Berkeley, CA: University of California Press.

Erlmann, V. (Ed.). (2004). *Hearing Cultures: Essays on Sound, Listening and Modernity*. Oxford: Berg.

Feld, S. (1993). From Ethnomusicology to Echo-Muse-Ecology *The Soundscape Newsletter*, 8. Retrieved from http://www.acousticecology.org/writings/echomuseecology.html

Feld, S. & Brennis, D. (2004). Doing Anthropology in Sound. *American Ethnologist*, 31(4), 461-474.

Färnstrom, M. & Taylor, S. (2014). The Creative Soundwalk. Paper presented at the inaugural symposium on *Urban Soundscapes and Critical Citizenship*, Limerick, March 2014.

Hamburger, E. (2014, June 20). Surprise: Snapchat's most popular feature isn't snaps anymore. *The Verge*. Retrieved from http://www.theverge.com/2014/6/20/5827666/snapchat-stories-bigger-than-snaps-electric-daisy-carnival

Haraway, D. (1988). Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. *Feminist Studies*, 14(3), 575-599.

Ito, M. et al. (2010). *Hanging Out, Messing Around, and Geeking Out: Kids Living and Learning with New Media*. Cambridge, MA: The MIT Press.

Järviluoma, H., Truax, B., Kyto, M. & Vikman, N. (2009). *Acoustic Environments in Change*. Tampere: University of Joensuu Press.

Jenkins, H. et al. (2006). *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century*. White Paper prepared for the McArthur Foundation.

Kautonen, O. & Koivumäki, A. (2010). Soundscape stories and routes in Pirkanmaa. Paper presented at *Ideologies and Ethics in the Uses and Abuses of Sound*, Koli, Finland.

Lane, C. & A. Carlyle (2013). *In the Field: The Art of Field Recording*. Uniformbooks.

Makagon, D. G. & Neumann, M. (2009). *Recording culture: Audio documentary and the ethnographic experience*. Thousand Oaks, CA: Sage Press.

McCartney, A. (2005). Performing soundwalks for Journees Sonores, canal de Lachine. In G. Giannachi, & N. Stewart (Eds.). *Performing nature: Explorations in Ecology and the Arts* (pp. 217-234). Bern, Switzerland: Peter Lang Publishing.
Norman, K. (2012). Listening Together, Making Place. *Organised Sound*, 17(3), 257 – 265.
O'Keeffe, L. (2015). Thinking Through New Methodologies. Sounding Out the City With Teenagers. *Qualitative Sociology Review*, 11(1): 6-32.
Pink, S. (2012). *Situating Everyday Life*. London, UK: Sage.
Radicchi, A. (2010). Living Soundscapes, Historic Cities and the Design of Urban Landscape. *The European Landscape Convention in research perspective*, Bandecci & Vivaldi (Eds), Vol II: 152-155.
Schafer, R. M. (1977). *The Tuning of the World*. New York: Knopf. Reprinted as *Our Sonic Environment and the Soundscape: The Tuning of the World*. Destiny Books, 1994.
Squire, K. (2009). Mobile media learning: Multiplicities of place. *On the Horizon*, 17(1), 70–80.
Sterne, J. (2003). *The Audible Past: Cultural Origins of Sound Reproduction*, Durham, NC: Duke University Press.
Stone, A.R. (1996). *The War of Desire and Technology at the Close of the Mechanical Age*. Cambridge, MA: The MIT Press.
Tonkiss, F. (2003). Aural Postcards: Sound, Memory and the City. *The Auditory Culture Reader*. In M. Bull & L. Black (Eds.) (pp.303-310). Oxford: Berg.
Truax, B. (1984). *Acoustic Communication*. Norwood: NJ, Ablex.
Uimonen, H. (2010). The moving microphone: social media and acoustic communication. Paper presented at *Ideologies and Ethics in the Uses and Abuses of Sound*, Koli, Finland.
Uimonen, H. (2011). Everyday Sounds Revealed: Acoustic communication and environmental recordings. *Organised Sound,* 16(3), 256–263.
Weissman, S. (2013, September 9). 15 Stats You Need to Know about Vine & Instagram Video. *Oracle*. Retrieved from http://digiday.com/brands/15-stats-vine-and-instagram-video/
World Soundscape Project. (1973). *The Music of the Environment Series*. Schafer, R.M. (Ed.). Vancouver: A.R.C. Publications.

Acknowledgements

Heartfelt acknowledgements to Suzanne de Castell and Barry Truax for supporting this project, and to the editor and reviewers for their invaluable suggestions.

Bio

Milena Droumeva is an Assistant Professor of Communication at Simon Fraser University specializing in mobile technologies, sound studies and multimodal ethnography. She holds a PhD in education and has worked extensively in educational research concerning game-based learning and computational literacy. Milena has an extensive background in acoustic ecology and some of her new projects include urban

soundscape research, sonification for public engagement, as well as gender and sound in video games. Milena has been recording and listening for over 14 years in Vancouver and Europe as part of her urban soundscapes and mobile media cultures research. You can find her musings on sound and other material goodies at www.natural.com.

Sonic Thinking: Epistemological Modellings of the Sonic in Audio Papers and Beyond

By Felix Gerloff & Sebastian Schwesinger

Abstract

How is culture constituted sonically? In what ways are perception, thinking and epistemic practices as such predisposed by the sonic? These questions are being tackled in Sound Studies research but can also be experimentally elaborated in the form of organised sound itself. To (re)present and negotiate concepts and argumentations sonically is a yet rather marginal and unconventionalised form that bears a high potential for future research in Sound Studies and beyond – thereby following the recent impetus of a design turn within the humanities.

We developed this approach further at the Fluid Sounds conference in Copenhagen (2015) where we produced the audio paper Transducing the Bosavi Rainforest. Sonic Modes of Processing Culture on constitutive sonic structures in Berlin and Amager (Copenhagen) inspired by Steven Feld's work on the Kaluli people. This article discusses sonic epistemology and thinking as theoretical background of this approach of writing through sound and describes a concept of the audio paper format alongside the example produced in Copenhagen.

Keywords

sonic epistemology, dispositif, sonic thinking, audio paper, sound semiotics, topology

Introduction

While the audio paper as a format for academic publication is capable of rendering sound-related insights, the epistemic mode in which it does so remains underdeveloped: the sonic modality can convey knowledge and build arguments just as much as language or images. Nonetheless, it is not an established way of symbolic articulation and hermeneutic understanding, and experimentation and deliberation within the academic community are necessary to determine an adequate sonic means of expression. Apart from mere stylistic conventions, it has to be assessed how audio papers actualise their academic truth function, i.e. in their accepted relations to external sources, connectivity to academic and social discourses, and overall verifiability. Listening to and making sense of audio papers has to be practiced and learned as well. The success of this undertaking will show that audio papers can constitute a novel and insightful mode of writing through sound.

Heinrich von Kleist wrote a now famous essay with the self-explanatory title Über die allmähliche Verfertigung der Gedanken beim Reden (On the gradual production of thoughts whilst speaking) (Kleist 1997). The same might be claimed for any mode of expression. In this light, the production of audio papers as a sonic mode of academic research and discourse itself adds additional insight to sonically interested analyses and leads to a practice-driven way of sonic reasoning that can be self-reflexively studied as

well. Thus, in our dispositif analytical research on sonic thinking we endeavour to identify and assess the forms and efficacy of sonic epistemic models in analysis and synthesis, taking into account dispositive structures of the sonic such as technological media, historical discourses and bodily listening practices. Studying the constitutive relations between sound phenomena and culture in this way may transgress the realm of the auditory, e.g. in tracing sonic models like resonance or noise. Once such productive models are identified they might have the potential to be intentionally transposed to other contexts – to foster alternative ways of understanding, but also of reconfiguring or designing the world we live in.

Departing from an investigation of such sonic epistemic predispositions, i.e. sonic models out of cultural analyses, we are exploring how to align contemporary research and publication methods on sound. Other projects have argued for a more sonically inclined academic publication format, one that allows for the incorporation of actual sounds as well advancing multimodal arguments[1]. Nonetheless, the workings of sound semiotics and semantics in this context as well as sonic modelling still have to be explored and discussed extensively. For example, techniques of audio production like text-to-speech, stereo positioning and montage may be utilised to this end. Such audio papers may figure as manifest mobilisations of the epistemic potential of sound that take the next step from acknowledging our conditions of knowing to expanding this possibility space through new means and modes of meaning and knowledge production that differ from conventional logics of subject-object, form-content, or representation and deduction. Testing sonic models for generating academic audio papers or as epistemic tools in non-sounding fields of knowledge production are but two of many conceivable prospects of such contemporary sonic thinking (Gerloff/Schulze/Schwesinger 2016)[2].

Academic Audio Papers

Taking into account the interdependence of sonic experience, knowledge and media, it is ever more important to rethink the media in which research on sound is rendered (public). The limitations of the traditional academic textual or verbal formats are well-known and often contested in experiments with multimedia online journals, interactive exhibitions or lecture-performances. An investigation of the epistemic potentials of sound can therefore be extended into such practices as well, and participate in the development of new academic publication formats. The epistemic qualities of sound that are being uncovered throughout much of ongoing Sound Studies research can now be addressed and actively appropriated for academic discourse itself[3].
Why stop at the discovery and investigation of sonic epistemologies in historical or contemporary fields of practice and culture? Why not try to foster work in the form of academic sound practices as well? The deliberate development of a sonic format explicitly tied to the presentation of knowledge and insight and the advancement of academic arguments seems to be a promising goal. Consequently, trying to render research on sonic culture in sound will not just present the results of investigations a posteriori, but also deepen the insights concerning the respective sonic matters, complement customary research practices and transform abstract or verbal argumentations incorporating the object of research into the researcher's ›text‹. What is lacking is a process of explicit deliberation in the academic community on accepted

epistemic procedures, standards and requirements for such works.

We joined the conference and publication initiative Fluid Sounds that endeavoured to stimulate such a debate with a focus on a format for audio papers, combining site-specific explorations of Copenhagen's Amager island with the search for sound-based conference and publication formats[4]. Complementary to traditional textual formats its organisers Sanne Krogh Groth and Kristine Samson highlight the key feature of audio papers as follows:

> [T]he overall argument in the audio paper also has to be unfolded, discussed or framed through ›pure‹ sounds such as sound effects, music, found sounds, sound souvenirs, soundscape recordings or compositions, all composed into a sort of sound scenography. It is important, that the sounds do not only illustrate and frame the [spoken language] in the audio paper, but also [carry] information that supports or questions the narrated content in itself. (Krogh Groth & Samson 2015)

At this point it is necessary to highlight that the overall approach of the audio paper as we imagine it to be is not a documentary one. Rather, it should be understood as a heavily designed and manipulated expression or instantiation of our epistemic process, in a way similar to a classical text essay. Although sonic aspects of the sites we explored for our Fluid Sounds contribution Transducing the Bosavi Rainforest. Sonic Modes of Processing Culture plays a prominent role in our research process, the focus is more on investigating the subject cultures or fields in a multi-sensorial, comprehensive way, complementing a sound anthropological approach with the study of relevant discourses, material settings and other related sources as part of a Foucauldian dispositif analysis. In other cases, audio papers could of course be devised that draw solely on historical research or the sonic rendering of theoretical considerations. The primary research in our case is oriented towards the identification of epistemic aspects of sound in their interdependence with each other and with other elements of the dispositive setting. If a somewhat consistent pattern is discernable, this can be grasped as a sonic model that informs cultural meaning and practice within its context. Sonic structures or models of course carry information about their cultural contexts themselves, but can also function as epistemic tools, figures of thought or attention guides for an investigation of culture in general. In a kind of reverse writing or oscillation between the empirical research and our thought process we then again try to convey these models sonically. This means not just to present specific sounds but to stylise these audible forms in a somewhat exaggerated way to achieve the kind of conciseness necessary for them to be understood within this novel format of an audio paper. So while recorded soundscapes provide material for the audio paper it is not so much about representing their original cultural context through them, but about expressing our insights, considerations, hypotheses etc. sonically. Within audio papers devised as a rather expressive format, it is possible to reference empirical sources beyond the incorporation of recorded sounds, to generate a formal and argumentative structure through synthetic or sampled functional sounds and to include some verbal commentary as well. This process will be illustrated throughout the rest of the paper in relation to our Fluid Sounds project after a brief exposition of the non-sound dispositions of the sonic that shift into focus as part of a dispositif analysis, laying the ground for a subsequent

rendering as an audio paper.

Analysis: Non-Sound Dispositions of the Sonic

A dispositif analysis of the sonic facilitates a grasping of sound phenomena in their interdependency with contextual non-sound elements and their epistemic functioning's in different registers of culture. These relations of sound and its effects in other modalities unfold a network of meaning that can serve as a starting point for the shaping of sonic thinking in audio papers. Searching for the sources of sonic thinking directs attention to the various forms of knowledge production. On a discursive level, notions of sound can be analysed and applied in terms of their epistemic qualities of conceptualising relations between or statuses of things, see for instance productive metaphors like harmony and rhythm. Sonic thinking can also point towards our physiological and cognitive processing of sound as a perceived phenomenon. Furthermore, sound media has implemented meaningful signalling protocols that use qualities of sound to transmit, process or store contents or purposes. Especially in scientific epistemology, sound has been utilised to impart information on biological or physical systems following standardised regimes of signification, such as in auscultation, acoustics or phonetics. What links all these different forms of sonic meaning and knowledge production is their embeddedness in dispositive structures. According to Foucault's notion of the dispositif all expressions and manifestations that are produced within a certain epistemic ensemble of apparatuses, juridical orders, infrastructural configurations, discourses, bodily imaginations, etc. delineate the field of possible knowledge and thinking (Foucault 1978) and should be taken into account accordingly.

In the context of this paper, we deploy this kind of dispositif analysis of the sonic on a small scale to identify sonic epistemic models that might be utilised in audio papers. Sound in this way can be described as an operational part of cultural formations that is multi-faceted and always contingent within its dispositives. Consequently, there can be no ontological definition of sound, but an ever context-dependent blending of its physical properties with its cultural, technological or practical predispositions. This cultural-material understanding of sound and its relational actualisations can be addressed as the sonic (Wicke 2008, Ernst 2014). Thus, the sonic is not another word for sound, it pins down the specific conceptualisations of sound conditioned and shaped in discourses, media environments, corporeal listening habitus, etc. A sonic dispositif is formed around specific sound phenomena, driven and developed by sound. In each context a specific formation of the sonic may be identified which brings to the fore applicable differentiations of what counts as music, noise, signal or silence; technological regimes of sound processing that shape the sonic materially; or the specific cultural formatting of sound that allows for the existence of a repertoire of discernable sounds that can be heard – to give some examples of what the notion of the sonic might provide for such an analysis. Within such a methodological approach the non-sound predispositions of sound often provide form and context for the sonic events to make them effective and meaningful. Following transductions of the sonic through physical and technical properties, cultural semantics, bodily perceptions and affects, and renderings in text or speech, the important characteristics of specific historical models of the sonic can be determined[5]. When an acoustic phenomenon is transformed, for

instance as noise into notions of discourses, as interference into protocols of technical media or as threshold into judgments about bodily constitutions, it organises our relationship to the ›world‹ in a material and symbolic sense beyond listening understood in a narrow sense, and is thus related inextricably to human conceptual modelling (Gerloff/Schwesinger 2015). Accordingly, a set of sonic epistemic and generative models might be found and described to be effective as ways of thinking, approaching and shaping the world in many domains – beyond even those that sound.

By exploring the sonic conditions of knowledge and thought through such historical analyses, we strive to acknowledge our own epistemic boundaries in order to challenge and enhance semiotic regimes of current academic formats[6]. This endeavour can be seen as the continuation of the diverse turns in intellectual history that have turned our attention towards new or neglected factors of cultural meaning or knowledge production, be it language, images, affect or space. The acknowledgement and reflexion of the epistemic impact of these factors in some cases led to novel forms of academic representation and publication; see, for example, the development of new film formats in anthropological practice[7]. We are convinced that such a step from analysis to synthesis (or ›Gestaltung‹) can open up many possibilities to further sonic knowledge production and discourse. But since academic formats for sound are not established yet, it is beneficial to draw on pre-existing formats within and beyond the academic realm like soundscape compositions, radiophonic plays and features or existing functional sounds in order to use their design parameters to evoke and implement historically grounded sonic models in audio papers as propositional forms that may be meaningfully listened to and interpreted.

In our audio paper project at the Fluid Sounds conference we applied the dispositif analytical approach to investigate one basic sonic cultural model that respectively pinpoints the cultural status quo of central Berlin and Islands Brygge on Amager Island, Copenhagen. Taking Steven Feld's work on the Kaluli people of Papua New Guinea as a conceptual starting point for our audio paper, we conducted multi-sensorial field research, complementing this soundscape and music anthropology by consulting texts on urban planning and development as well as visual historical material, investigating traffic documentations, interviewing inhabitants, and analysing and engaging with the local media ecology. It is important to underline that the found and incorporated sonic models are not supposed to cover the ›whole‹ of any of these three contexts. Nevertheless, the concrete formal and sound design of these models within the resulting audio paper is the core challenge of this kind of writing through sound. Especially when it comes to its primary elements – the constitutive non-verbal sounds – the specific design decisions are far from being trivial and are always epistemic decisions as well.

The audio paper starts with an introduction to Steven Feld's exploration of the sonic figure of ›lift-up-over sounding‹. Feld identifies a specific organisational principle of Kaluli culture, which is more than a metaphor, it is a homologous structuring of rainforest soundscape perception, song and performance formats and even the Kaluli's social organisation (Feld 1992). We investigated this sonic figure and the epistemic structuring of its sonic and topological dimensions in respect to the specific ways overarching sonic models work in principle. We included it in the first part of the audio paper to invoke a sonically modelled relation between soundscape, music and social life

that we wanted to research for Berlin and Amager as well. We strove to compose the second part on Berlin similarly: instead of ›lift-up-over sounding‹ we found that the musical structure of build-up and drop in electronic dance music can be regarded as pervasive in Berlin's musical life as well as in its urban development and social life. Our investigation of Amager for the third section of the paper uncovered some parallels between this part of Copenhagen and the current state of Berlin. But what sounds were typical of the island? Rather than considering a musical figure as in the example of Berlin, we concentrated on the natural soundscape here. We identified waves as an important concrete aspect of this soundscape that also play a prominent role in the context of Amager's big radio stations as well as in the daily rhythms of commuter traffic. We then combined the ongoing build-up in Amager with the wave as a form to end up with the sonic model of a rising tide. The following section explores the ways in which we rendered these insights, modellings and materials sonically within the audio paper and our conceptual thoughts on the process.

Synthesis: Rendering Sonic Models in Audio Papers

Complementary to the methodological input from Feld's sound and music culture study that we tried to integrate with a sonic dispositif analysis in our audio paper, we had to develop a design strategy for rendering the found sonic models into a sounding academic argument. Thus, we started to devise audio papers that depart from conventional academic text essays or papers in order to transfer means and formats of reasoning into audio. Textual functions like indirect speech, dialogue, highlighting or punctuation play an important role when determining the meaning of written discourse. Similarly, auditory cues that don't seem to belong to the overall sound of the piece could be utilised to demarcate different parts or signal, for example, the appearance of a thesis. Where verbal speech is used in audio papers there are many possibilities to position and arrange different voices in order to correlate or juxtapose their statements. Considering quotations, italics, bold or underlining in an auditory realm not only calls for conventionalising equivalent means of expression but also for thinking about sonic means that convey aspects of their specific functions. The oral dimension of speech already enriches written language with its use and need for intonation, pronunciation, tempo, rhythm, dynamics, etc. But on the same side, such articulation narrows down a text to a certain meaning by stressing specific interpretations. The reconstruction of a writer's meaning is difficult to differentiate from the interpretation of the author of the audio paper when listening to a read quote, for example. Therefore, different frequency filters can be applied to interpretive verbalisations of written text as an additional layer in order to highlight text segments or key terms for the audio paper argumentation. In our Fluid Sounds project we employed Text-to-Speech (TTS) to verbalise quotations. Although TTS makes the listening comprehension more difficult we believe it has a strong value as a means of sound design in this context. It presents external context in an electronic voice, thereby conveying the secondary quality of the material by the level of mediation it embodies. In its artificiality and because the purpose of the technology is known, it also highlights the origin of the material in written text and emphasises the restraint from personal intonation and interpretation. The quotes are given in writing on the audio paper's webpage to remedy the disadvantage of TTS for listening. The semiotic relation of an audio paper's ›text‹ to its multi-faceted referenced sources itself is modelled by the use of such tools.

Audio example Lift-up-over sounding Bosavi[8]: Quote of Raymond Murray Schafer (1994[1977], p.40):

> [W]e should draw attention to the fact that many of the signals communicated among animals – those of hunting, warning, fright, anger or mating – often correspond very closely in duration, intensity and inflection to many human expletives.]

AudioPlayer

Expanding the work on audio papers in this vein, a toolbox of sound design – an auditory rhetoric or grammar – may emerge that helps establish this format in the academic discourse. Compared with the audio design of speech, structuring non-verbal argumentation can be even more challenging. In the example above, Feld's arrangement of field recordings should not be regarded as an illustration of his written argumentation. Instead, one can productively analyse why the sound passages that he published so convincingly support his theory – besides the fact that the aesthetics of field recordings confirm some kind of authenticity or evidential quality. Treating the recordings as artefacts, i.e. as records that embody a certain spatial and temporal logic that can be worked with for compositional reasons, three organisational principles seem to be relevant for a lift-up-over sounding impression. First, a foreground is clearly distinguishable from a background. After giving the impression of approaching a village, human communication and work activities are centred and singled out as staged performances for which the sounds of the forest still act as a recognisable but distant scenery. This division is replicated in the background as its sounds do not completely smooth into a ›monochrome‹ noise floor. Fairly clearly objectified utterances of its animal inhabitants speak out towards the foreground as mediating components and signifiers of possible connection. Second, the rhythmic patterning of the subsequent stomping reveals the synchronisation model that works on discernable pulses to structure the spatial order also temporally, namely in phases of foreground impulses and phases of background impulses. This underlines the isolation of certain background signals while keeping some distance to them. Third, this creation of shared but apart space-time is emphasised by the following melodic harmonising in which the performing person in the front tunes in with appropriate tonal whistles. In fact, what Feld is providing the listener with is the ongoing process of synchronising and de-synchronising of audio signal sequences on various levels in order to present the sonic model he discovered. In the successful moments of multi-level synchronisation the emergence of this pattern can be felt affectively.

When specific sound events fall into place in what appears to be a ›natural‹ composition, their new contextual framing changes their sourcing of meaning and system of reference from an ecologic to a figurative order. In this case a sonic cultural model can highlight structural or relational aspects of its elements and as a whole while representing the sound phenomena themselves in a detail that would be difficult to transpose into written text. Semiotics, building on Charles Saunders Peirce, has described this as a shift from an indexical sign function to an iconic one (Peirce 1955,

Sebeok 1994). Listening to non-verbal sounds usually works indexically, i.e. they (re)present their original empirical setting directly. In this way sounds direct our attention to their emitters. Providing more information on their emitters, for example on their colour, shape or biography, is, however, difficult to accomplish with this semiotic function. Words, on the other hand, are able to reference and relate diverse things and concepts. In this sense, a sonic logic cannot be as clear and precise in communicating various contents, whether in its representational or in its argumentative aspects. Nevertheless, sonic references and representations are far from being unusual, as sounds cannot be separated from their situational, societal, discursive, medial, juridical, etc. connotations. Utilising them can trigger understandings of outlined referential arguments by invoking meaningful contextualisations and associations. Referring to Peirce, this would account for the arbitrary symbolic function of signs. His third category, the iconic relation, might be exactly the mediating relation that facilitates the various connections between different realms, the semiotic conception that is complementary to the intermediary concept of the sonic. Turning once more to the example above, it becomes obvious that the emerging order of the sonic cultural model of the Kaluli draws upon indexical and symbolic sign functions, the former by directing attention through sound signals, the latter by culturally loaded referencing to structuring categories and concepts beyond a human-animal divide. The link between both functions is established through the emergence of a spatiotemporal event that is organised and structured by the sonic modelling of a specific form of synchronisation, relation and articulation of individuals and their environments. In this sense, sonic cultural or epistemic models might operate relying on Peirce's concept of iconicity as it establishes formal relations of similarity that become in itself meaningful.

Making use of this line of thought we strove to develop and present a sonic cultural model of Berlin in the form of a build-up. Using a street scene as our departure point we introduced the sounds of a nearby construction site. Apart from representing itself, the construction site in the context of Berlin invites the listener to comprehend this sound on a more general level: It quite literally alludes to the fact that there is currently much construction work happening in the city, and in another layer invokes the associated social debates concerning gentrification. Using spoken language as the narrating voice we then also introduced the musical concept of the build-up and subsequently inserted the dimension of musical culture of public urban life in a subtle way as well. In our analysis the focus lies specifically in discerning relations between the realms of soundscape, music and social life. Accordingly, the field recordings were complemented with other samples and morphed into a musical build-up reminiscent of that used in electronic dance music. This was not an arbitrary choice, since this music is the most prominent kind of popular music in Berlin and an important part of its image as a thriving city that many people and companies like to be part of. Thus, we utilised an iconic relation between the escalation of construction activity, people moving into town and the rising of suspense in the electronic music club to transform this semiotic function into a symbolic one: to make an argument on the contemporary cultural situation in Berlin on the basis of a sonic model.

Audio example: Build Up Berlin

Audio Player

Soundwise, the sonic model of a build-up draws first and foremost on spatial properties of sound, such as frequency cancellation due to different wavelength propagation, or loudness felt due to distance and reverberance characteristics. Dynamic filtering and terraced dynamics can generate the effect of an ever increasing or approaching intensity of sound. With the advent of disco in the 70s the correspondence of basic spatial orders of above/below and left/right – or more dynamic vectors surpassing these orientations – with ›high‹ and ›low‹ frequencies of tones could finally be operationalised for the management of affective excess on the dance floor. At that time the long tradition of spatially orienting and metaphorically interpreting frequency differences had been effectively incorporated into the media ecologies of clubs that layered frequency ranges vertically for the first time. This new ensemble of listening technologies (maxi-singles & sound systems) has re-organised hearing and facilitated specific cultivations and technisations of perception, thereby working their way into the very corporeality of the listeners[9]. This development could be regarded as the starting point of the cultural semanticisation of the build-up as a topological figure. Habitualising non-cochlear listening practices that correlated with this development meant to bodily experience this spatial articulation as well. The cultural connotation of affective excess depends on a form of distributed agency that emerges through a dispositive entanglement of all its human and nonhuman elements (Kassabian 2013, Henriques 2011). These elements, bound together by this model, are therefore subject to a process of (in)formation that can't be traced back to any singular origin or driving force. It is impossible to stop once set into motion, leading to an inevitable implosion, which is used in our example to organise sounds of urban development in accordance with musical parameters to evoke the same topologic of excess in the context of gentrification. In this way non-sounding cultural semantics can be addressed by utilising spatial and affective characteristics of sound as music.

Complementarily, positioning sounds or speech horizontally along the stereo panorama can be used to statically oppose or associate, or dynamically relate events or arguments. It may also refer to our reading direction from left to right to signal relations of progress or consequence. In the last part of our audio paper concerning the island of Amager, Copenhagen, we appropriated this topological approach in a less musical and affective but more geographical and gestural sense. Investigating this area, we focused on the southern part of a quarter called Islands Brygge which is being redeveloped as a residential coastal neighbourhood. It stretches out from north to south in a rather long strip and is complemented by a vast public recreational area, the Faelled. As mentioned above, the various characteristics of this quarter led us to introduce the rising tide as a hypothetical sonic model for the ongoing developments there. In a structural homology to the local geography we mapped the construction-site sounds of urban development on the left (Western) side of the stereo mix and the bushes-and-woods sounds of the Faelled on the right (Eastern) side. Beginning with the recording process, we mimicked the waveform by rotating the binaural microphones vertically to achieve a similar kind of spatial impression when listening. Sonifying the increasing activities in this area we

then successively added sonic events, steering them across the imagined territory. We used panning to merge the previously distinct parts of the residential strip and the recreational park and tried to create the impression of a rising tide by using the site-specific field recordings. When taking this topology into consideration while listening, much more sense can be made out of the piece than just by identifying specific sound sources like nature sounds, the waterfront or the talk in a local bar.

Audio example: Rising Tide Amager

Audio Player

These dimensions of the semiotic concept, the implemented topology or means like TTS for making references to other kinds of sources are but three of several possible registers of meaning-making that could be developed for audio papers. Much the same as the spatial order is linked with semantics, the temporal order can be utilised to establish a distinct structure for an argument as well. The temporal succession in the piece can for example be correlated with the order of historical time or simply convey a process of development in telling a story. Experimenting with clearly demarcated parts similar to rhetoric or musical forms can help to clarify whether the respective sonic material is meant more to present content, make an abstract point, lead over to another area or serve as a summary. Through rhetorically denominated parts the function of the presented sounds and their relation with each other may be understood better. Another way to juggle with argumentative relations of concepts could be to further differentiate the topological semantics with a stronger use of foreground/background relations, layering of sounds in different distances and making use of auditory masking for comparison. Gender aspects as well as human-machine-relations could be tackled by manipulating the tone of incorporated voices. The voice could serve in general as the platform for modelling specific kinds of subjectivities. Needless to say, the verbal and non-verbal sonic material and the paper's paratexts don't necessarily have to work together to support their respective argument as in our audio paper, but can also contrast, contradict or complement each other to constitute the paper's sense. While Transducing the Bosavi Rainforest might still sound pretty similar to well-known soundscape compositions, in our upcoming work we want to more strongly develop the argumentative dimension of audio papers versus their representational mode.

Conclusions

To sum up, what kinds of epistemic logic or propositional form are put forward in audio papers as we evoked them here? Although language might be incorporated, the logic on the sonic level itself doesn't work like human language neither in its representational nor in its argumentative aspects, because there isn't a fixed sonic vocabulary or grammar for this function. Nonetheless, through the sonic material details of sound phenomena can be conveyed that would be hard to describe in writing. As words reference things or concepts, the same can be reached by sonic references that invoke imaginations of their sources as in the simple case of primarily indexical sounds – remember the construction work in Berlin. The musical figure of build-up and drop on

the other hand works primarily metaphorically and tells the listener that we attest this ongoing build-up and raise the question of a following drop concerning Berlin's urban culture. This proposition could only be made because the musical origin of this figure provides it with a specific meaning. The fundamental dimensions of space and time bring along their own structures of sense and meaning. A temporal order within the piece puts sonic events into relation and suggests an analogous temporality in the referenced context. This can also be thought of rhetorically: introducing an argument, complementing it with a counter-argument and then coming up with a synthesis. Similarly, spatial configurations in sound design utilise established semantics of, for example, high and low or foreground and background. Terming frequencies high and low is already an effect of this spatial logic. Relations of elements of an argumentation can accordingly be modelled through their positioning in a topological order. Argument and counter-argument could for instance be arranged on opposing sides of the stereo spectrum.

The argumentative logic of audio papers thus emerges through structural, figurative and propositional sonic forms that can manifest relations specifically and precisely. It becomes clear that sonic figures and models facilitate the production of meaning in audio papers by their mediation between sound and non-sound dispositions of the sonic, different realms of culture and fields of knowledge. Audio papers therefore not only depend on a thorough analysis of the research object or field, but also draw on the repertoire of other studies of epistemic qualities and functionings of sound as well as practical knowledges of sound design that are densified to build its form and content. The aspects of analysis, modelling and synthesis that we unfolded here are accordingly – and bearing Kleist in mind – inextricably interwoven in practice instead of being conducted consecutively. They don't have to be related to the same object: It is not necessary, for example, for a sonic pattern found in analysis to be rendered audible in the audio paper. Instead, a model derived from a different analysis might be used as an epistemic tool itself, contrasting or primarily informing the analysis and providing a different perspective on the subject matter. Of course producing and listening to audio papers has to be practised and habitualised for such a novel communicational, representational and epistemic format in order to function properly. Misinterpretations and irritations should be seen as productive factors in this process rather than failures. If such a development successfully takes place, audio papers can constitute a novel and productive mode of writing through sound.

Footnotes

1. These projects include the original context of our audio paper discussed here, the Fluid Sounds conference, as well as the online collection Provoke! Digital Sound Studies or some works on the digital publishing platform Scalar (Schäffner 2010)
2. This project relates to the recent design turn in the humanities, similarly striving for an inclusion of analytical and reflexive research in design processes on a social and cultural level, understood in the broad sense of ›Gestaltung‹
3. Veit Erlmann's study Reason and Resonance conducts such historical research on sonic thought and discourses in an exemplary fashion (Erlmann 2010)
4. Notably, the conference was not only concerned with audio papers as publication formats but also with presentation formats and site-specific installations
5. In a similar vein, Jonathan Sterne's study of the MP3 format (Sterne 2012b) and Shintaro Miyazaki's work on algorhythmics (Miyazaki 2013) investigate the interrelation of technology, sound and culture
6. As Erich Hörl points out in relation to Gilbert Simondon's work, we are currently undergoing a shift in our regime of meaning, knowledge and sense towards a technological and ecological conditioning: »It originates the new sense-culture of technology – with multiple, transversal agencies beyond the centralization and monopolization of the working-meaning-perceiving human subject (Hörl 2013, p.125)
7. An early example would be the films of Trinh T. Minh-ha. Currently, the works of Lucien Castaing-Taylor and Véréna Paravel expand this tradition [↩] This audio example contains excerpts from the following two tracks: "Fo:Fo: and Miseme sing at their sago place" by Fo:fo:, Miseme & "Voices of the forest: a village soundscape" by Bosavi Village; from 'Bosavi: Rainforest Music from Papua New Guinea,' Smithsonian Folkways Recordings, SFW40487_204, provided courtesy of Smithsonian Folkways Recordings. © 2001. Used by permission
8. For example, the famous Levan Horn and other devices targeting bass and sub-bass frequencies invented in the 70s were positioned on ground level and expanded the range of the sonic into the infrasonic area; tweeters were hung high beneath the ceiling (Papenburg 2012)

References

Attali, J., 2011. *Noise. A Political Economy of Music*. 11th ed. Minneapolis: University of Minnesota Press.

Bijsterveld, K. & Pinch, T., 2011. *The Oxford Handbook of Sound Studies*. Oxford: Oxford University Press.

Erlmann, V., 2010. *Reason and Resonance. A History of Modern Aurality*. New York: Zone Books.

Ernst, W., 2014. Epistemologie des Sonischen und Medienarchäologie des Akustischen. In: Matejovsky, D. ed. *Resonanzräume. Medienkulturen des Akustischen*. Düsseldorf: düsseldorf university press, pp.87–106.

Eshun, K., 1998. *More brilliant than the sun. Adventures in sonic fiction*. London:

Quartet Books.
Foucault, M., 1966. Message ou bruit?. In *Concours medical* 88, pp.6285–6286.
Foucault, M., 1978. *The history of sexuality. Vol.1: An introduction*. New York: Vintage Books.
Foucault, M., 2003. Das Spiel des Michel Foucault. In: Defert, D. & Ewald, F., eds. *Dits et Ecrits, Schriften in vier Bänden. Bd. 3*. Frankfurt: Suhrkamp, pp.391–429.
Feld, S., 1992. *Sound and Sentiment. Birds, Weeping, Poetics, and Song in Kaluli Expression*. 2nd ed. Philadelphia: University of Pennsylvania Press.
Feld, S., 1994. *From Ethnomusicology to Echo-Muse-Ecology: Reading R. Murray Schafer in the Papua New Guinea Rainforest*. http://www.acousticecology.org/writings/echomuseecology.html [Accessed July 29, 2015]
Gerloff, F. & Schwesinger, S., 2015. Die Erfindung des Dezibels und Lärmmessung in der Stadt. Auditive Medien als Reservoir epistemischer Werkzeuge. In *Navigationen* 15(2), pp.51–75.
Gerloff, F., Schulze, H. & Schwesinger, S., 2016. *Sonic Thinking*. Available from www.soundstudieslab.org/projects/sonic-thinking/
Henriques, J., 2011. *Sonic Bodies. Reggae Sound Systems, Performance Techniques, and Ways of Knowing*. New York: Continuum International Publishing Group.
Hörl, E., 2013. A Thousand Ecologies. The Process of Cyberneticization and General Ecology. In: Diederichsen, D. & Franke, A. eds. *The Whole Earth. California and the Disappearance of the Outside*. Berlin: Sternberg Press, pp.121–130.
Kassabian, A., 2013. *Ubiquitous Listening. Affect, attention, and distributed subjectivity*. Berkeley: University of California Press.
Krogh Groth, S. & Samson, C., 2015. *Audio Paper*. Available from https://fluidsounds.ruc.dk/audio-paper/ [Accessed July 29, 2015]
von Kleist, H., 1997. On the Gradual Production of Thoughts Whilst Speaking. In: Constantine, D. ed. *Heinrich von Kleist. Selected Writings*. London: J.M. Dent, pp.405–409.
Miyazaki, S., 2013. *Algorhythmisiert. Eine Medienarchäologie digitaler Signale und (un)erhörter Zeiteffekte*. Berlin: Kulturverlag Kadmos.
Murray Schafer, R., 1994[1977]. *The Soundscape. Our Sonic Environment and the Tuning of the World*. Republished by Rochester: Destiny Books.
Papenburg, J.G., 2012. *Hörgeräte. Technisierung der Wahrnehmung durch Rock- und Popmusik*. http://edoc.hu-berlin.de/dissertationen/papenburg-jens-gerrit-2011-12-04/PDF/papenburg.pdf, [Accessed July 29, 2015]
Peirce, C.S., 1955. *The Philosophical Writings of Peirce*. Edited by Buchler, J. New York: Dover.
Schäffner, W., 2010. The Design Turn. Eine wissenschaftliche Revolution im Geiste der Gestaltung. In: Mareis, C. et al. eds. *Entwerfen – Wissen – Produzieren. Designforschung im Anwendungskontext*. Bielefeld: Transcript, pp.33–46.
Schulze, H., 2012. The Body of Sound. Sounding out the History of Science. In *SoundEffects* 2(1), pp.198–209.
Sebeok, T.A., 1994. *Signs. An Introduction to Semiotics*. Toronto: University of Toronto Press.
Sterne, J., 2012a. *The Sound Studies Reader*. London: Routledge.
Sterne, J., 2012b. *MP3. The Meaning of a Format*. Durham: Duke University Press.
Volmar, A. & Schröter, J., 2013. *Auditive Medienkulturen. Techniken des Hörens und*

Praktiken der Klanggestaltung. Bielefeld: Transript.
Wicke, P., 2008. Das Sonische in der Musik. In *popscriptum – Das Sonische. Sounds zwischen Akustik und Ästhetik* 10, pp.1–21.

Bio

Felix Gerloff (*1986) is a research associate at the Institute of Experimental Design and Media Cultures within the research project Machine Love? Creativity Cultures in Underground Electronic Music and Software Engineering and PhD candidate at the Humboldt-University Berlin. He graduated in 2013 as Magister Artium (M.A.) at the Humboldt-University's Institute for Cultural History and Theory. His PhD project focuses on the interrelation of creativity cultures in software development with material infrastructures of work and economical modes of production. Since 2011 he is organising the public lecture series KlangDenken (sonic thinking) in collaboration with Sebastian Schwesinger and Holger Schulze's Sound Studies Lab. His work includes further project management and curating for the C60/Collaboratorium for Cultural Practice.

Sebastian Schwesinger (*1982) earned a Bachelor of Business Administration in Microeconomics, and graduated as Magister Artium (M.A.) in Cultural History and Theory, Musicology and Philosophy. He is research associate at the Cluster of Excellence Image Knowledge Gestaltung at Humboldt-University Berlin in a project on Analog Storage Media where he studies the history of noise as a figure of thought in specific market settings. Together with Felix Gerloff and Holger Schulze he organises the public lecture series KlangDenken (sonic thinking). He also produces artistic-scientific audio and radio pieces. He is founder of the Berlin based radio programme Kulturwelle and part of the gamelab.berlin.

Exploring the Urban Mediterranean Soundscapes in Cyprus and Malta: A Comparative Study

By Yiannis Christidis & Michael Quinton

Abstract

The contemporary Mediterranean Soundscape is a living organism, articulated by the ever-changing landscape, the growing building sprawl and vibrant urban activity. Accordingly, in Mediterranean Urban areas, towns' identities are shaped partly by the rhythms of the everyday life of their inhabitants.

This article approaches the contemporary soundscape of two Mediterranean places: the city centre of Nicosia in Cyprus and the urban areas of Malta. After practicing two respective soundwalks to describe the places' sonic environments, the research uses eighteen in-depth interviews to examine the relationship between the cities' inhabitants and their soundscape, and to explore the way people identify characteristic sounds of their place. The people of these islands appear to identify the soundscape of their place in a parallel, if not similar, way, giving particular attributes to key features of the Mediterranean soundscape. Through this study, the article outlines such similarities, as well as differences between the two soundscapes.

Keywords

soundscape, noise, urban sound, Mediterranean

Introduction

In recent years the role of sound in everyday experience in the field of urban communication has been given significant importance by the academic community, as discussions on natural acoustic environments have begun and are becoming more popular. Everyday resonances which are caused by people's daily actions form parts of the overall sonic character of an urban area. The connected multidimensional triadic system of sound, environment and listener, has been widely studied since the late 1970s, within the field of Acoustic Ecology, where issues concerning environmental sound in terms of acoustic communication have been the main focus (Truax 1999). After the introduction of the term 'soundscape' (Schafer 1977), new terms in the academic community were coined to enhance the description and the need for preservation of the acoustic environment (Truax 1984). Terminologies such as 'sound signal' or 'soundmark' (Truax 1999) have enriched the process of preserving a sacred natural 'silence' which was dominant in our world in early, less human-centred environments.

In parallel with the development of the field of acoustic communication, a continuous exploration concerning other aspects of the patterns sound acquires in real life has been evolving, also combining theories and methods of various disciplines and academic areas. Although terms such as 'acoustic horizon' (Blesser & Salter 2007), or other kinds of categorizations, like geophonies, biophonies, anthropophonies or technophonies (Krause 1987) have been coined in time and used equivalently, expanding the focus of

Sound Studies, the basic emphasis of Acoustic Ecology remains the same: Sound, as a communicational means, needs more attention by us, the listeners.
Today, the concept of sound is analogously discussed within the wider field of sound studies. This area frequently refers to well-established scientific directions in contemporary research, in order to describe and explore a series of stimulating thematic fields under study. Approaches of the cityscape emerging from sound studies and urban studies (Kang 2007), for example, put in the forefront the importance of everyday cityscape sounds; since these interconnect place, sound and the city, they can be considered as constituents of an established basis for sound research (Wissman 2014).

The evolving research terrain of City Sound

Although the subject matter of Acoustic Ecology draws from the sounds of nature and the preservation of the silence of the sound environment before the industrial revolution, particular terms used in this scientific field seem to be suitable for contemporary studies concerning the city soundscapes. 'Soundscape' as a term refers to everything we hear, and from his early studies, Schafer had already used the term 'lo-fi' soundscape to describe the acoustic environment dominating the city, where machinery, cars and traffic resonate on a regular basis (Schafer 1977). Bull proposed a re-evaluation of the significance of one's auditory experience in the city (Bull 2001) and LaBelle discussed the city sound extensively, drawing attention to the forming of acoustic communities in the contemporary urban environment (LaBelle 2010). The theory of the sonic effects (Augoyard & Torgue 2005), on the other hand combined with CRESSON's (Amphoux 2003) approach on everyday sound in the city, complete a resilient theoretical basis for the study of city sound. A need to delve into a sound communication model is now being met by sound researchers who explore the sounds of urban or rural areas in the wider field of sound studies. (Sterne 2012).
The sonic identities of European cities have been extensively discussed by Amphoux (1993), who proved that sonic, spatial and socio-cultural dimensions, extensively discussed by listeners- whether such discussions happen after commented walks in the urban environment, or after listening to related sound compositions in a studio- are able to provide a satisfying description of the urban sonic identity of a place. Such dimensions appear to have an effect on the inhabitants' everyday life, thus, some certain features appertaining to life in Mediterranean places and resonating in the relevant soundscape would be expected to affect the quality of the inhabitants' everyday activities.

Interconnections and roles of landscape and soundscape in contemporary Mediterranean Places

The characterisation of a 'cosmopolitan superstructure' (Braudel 2001), as the ancient area of the Mediterranean was described, appears to be potentially still applicable today. A relocation of people would necessarily include the relocation and change of the resonance of their everyday activities; therefore, an important part of the ecology of the countryside, based on the triad of olive trees, vineyards and wheat, moved to the cities being transformed, in terms of its habits and sounds.
Composing the cityscape of a place in the Mediterranean area, both the roles of landscape and soundscape should be considered. Such a function, however, raises a

crucial question: 'the streets, squares, and stone; the form of a city- do these contours also shape its sounds?' (Chambers 2008: 42).

In the process of characterising the area of interest, it is crucial to point out the variety and diversity of the cultural elements present throughout such regions. Regarding its multimodality, Burke III states that 'a cultural fracture zone whose modern history contains deep structural continuities at the political and cultural levels, (and) even as it displays equally obvious discontinuities, the Mediterranean is the region where Europe, Asia and Africa come together' (2010: 199). Should its soundscape be an 'evolution' of landscape, or at least should soundscape ecology share parallels with landscape ecology and thus be interconnected (Pijanowski, et al. 2011), a contemporary listener would feel this growth: A constant evolution is evident in the context of the growing European cities, which includes their financial empowerment and social dynamism (Turok & Mykhnenko 2007).

Development in Mediterranean cities seems to start in a piecemeal way to just compensate for extra housing, a fact that crucially contributes to the uncontrollable sprawling around the city. From Izmir's massive growth (Hepcan, Hepcan, Kilicaslan, Ozkan, & Kocan 2013) to Athens' growing vertical profile (Salvati, Zitti, & Sateriano 2013), and from the Italian cities' peripheral State-built estates to Barcelona's viviendas marginales and to Greece's and Portugal's sudden erosion of illegal buildings (afthereta and bairros clandestinos, respectively) (Leontidou 1990: 251-252), the urban –in terms of buildings- expansion appears to also influence the listener's auditory experience. In many areas of the Mediterranean, new housing areas that sprouted out of the 1960's were planned in grid formation, keeping a certain road width; however, simple everyday structures like pavements/sidewalks were not carefully taken into consideration. Additionally, in many cases, like Malta and Cyprus, no green belts were formed between most towns and this would possibly explain the reason why they all merged into one big urban sprawl (Quinton & McGregor 2014).

Farina et al. stress the heterogeneity of the Mediterranean landscapes, as their inhabitants are also heterogeneous, to justify 'a soundscape with a fine spatial and temporal resolution, and a result of this parallel behaviour of sounds to landscape structure, soundscape indices (such as acoustic complexity or diversity) will be important indicators for ecosystem dynamics across human-dominated, complex landscapes' (Farina, Buscaino, Ceraulo, & Pieretti 2014: 11).

Urban Mediterranean Soundscapes: The cases of Malta and Cyprus

The natural Soundscape of a place has its unique tones (Schafer 1977: 26) and it is ethnological, because it is the listeners' identity that is moulded by the environment in which they live. The soundscape of a country is its signature, and accordingly, every place has its own resonant signature. In such Mediterranean countries, one would expect a typical noisy environment buzzing with the drone of traffic and public spaces overrun by excessive noisy activity. Certain areas of commercial importance are characterised by such noise but upon leaving the hubbub of these areas, one can find places enshrouded by a sacred silence (Bezzina 2010: 47).

Even though there are distinct features that make a country's soundscape unique in various respects, the region of the Mediterranean shares similar characteristics of hot summers and cool winters, while drastic weather changes such as torrential rains and high winds are common. The varied, ever changing landscape of high Mountains, rocky

shores, sandy beaches, coastal wetlands and the famous clear, blue sea define the Mediterranean region.
Despite being EU capitals, both Cyprus and Malta 'are influenced by their island characteristics to a great extent' (Böhme, Hanell, Pflanz, Zillmer, & Niemi 2009: 36); such quantitative similarities between the two countries are briefly presented on the table below (Solly 2012):

	Cyprus	*Malta*
Size	9520 sq. km	316 sq. km
Population	0.8 million	0.4 million
Under British rule in the past	yes	
Agriculture GDP	About 2%	
Industry GDP	About 19%	
Services GDP	About 79%	
Tourism GDP	About 12%	About 30%

Table 1 Similarities and differences

Such shared characteristics support the idea to study the two places simultaneously and acquire and examine 'island' and 'small size' characteristics, especially on how these are translated to sound. Nicosia and Valletta are the capital cities of these small Mediterranean islands, both characterised by a population working and participating in everyday activities. Both islands have similar temperatures and climate; however, there are geological differences with Valletta being situated next to the sea, whereas Nicosia is positioned in the centre of the island of Cyprus.

The city centre of divided Nicosia

The centre of Nicosia, which is the city centre of the Larger Urban Zone (LUZ) of the capital of Cyprus, has been divided since 1974. Since then, the Greek and the Turkish communities live in the southern and the northern part, respectively, separated by a strip of an abandoned, barbed wired space, under the supervision of the United Nations. Both sections of the city centre of Nicosia are surrounded by the remains of 16th century Venetian Walls, alongside many residential buildings with the architectural style of the 60s and 70s, some of which are currently being renovated, as well as a great number of buildings used as workplaces: car repair garages, wood, glass or iron workplaces or shops selling tourist souvenirs. The continuation of everyday life activity is geographically and culturally interrupted by the Dead Zone, which includes the abandoned places and only allows the waves of the sounds among the northern and the southern part of the city to cross.

Malta as a concrete urban place

Malta is a small island but in its smallness, its contrasting scenes, landscapes and levels of activity invoke an ever-changing soundscape. Its population grew substantially after the war; it doubled in amount, creating an urgency for housing. The island of Malta has been called 'Valletta' which does not only refer to Malta's Capital city, but incorporates the whole mainland island.

Having introduced the key concepts of the theoretical framework used in this article, and having overviewed the main characteristics of the urban areas-contexts of our study, at this point we should make some clarifications about our study design. Based on the assumptions that certain parts of the aforementioned models of Westerkamp (1974) and Amphoux (1993) can be applied in the area of Mediterranean places, and suggesting that the sound qualities have an effect on people's attitudes, our research was conducted in order to answer to the following research questions:

> a) Which are the sounds that characterise the places of Nicosia in Cyprus and Malta, and how do people connect with them?
> b) Which sounds do people recall from the past and how do they feel towards them?

The Study Method

Mediterranean places are considered to be highly noisy; the research method investigating this phenomenon involved field study, where both bottom-up and top-down methods were used to collect data: While soundwalking by the researchers themselves appears to be directing the research to experiential modes, ethnographic interviewing (Gobo 2008) reveals exact paths through which people give meaning to their place, and unveil sounds which inhabitants recall and which evoke emotions in them.

During the investigation of the sonic environment in urban areas, it appears important to consider that 'the dynamics of the city walks which permit the mixing between the spatial and temporal sonic spaces, allows the development of the characteristics of the crossing place' (Tixier 2002: 109). As initially proposed by Westerkamp (1974), soundwalking as a research method encourages interaction and discussion with soundwalkers who have been 'exposed' to the same experience, listening through their personal perspective. The soundwalks in the case under study have been conducted in a concept of differentiating the standards of the initial method. Since there were no groups walking around the areas, an alternative experiential approach was used: the authors conducted parallel soundwalks on their own in the areas of interest, the city centre of Nicosia and the city centre of Valletta respectively and chose to work with the written descriptions of their experience, rather than recordings. A justification of such a choice would emphasise the personal experience and a targeted interview conduction.

Agreeing with the attitude that the 'convergence of soundscape studies and ethnography should be emphasised…', in this article the view that 'diverse approaches to the soundwalk… can be integrated into ethnographic research' (Iscen 2014: 134) is supported. The research compensates for the feature of interaction that has not been used in the current methodological tool, with the use of the obtained data from the interviews: As in-depth interviews potentially provide the investigator with information

directly from the subject under investigation, we decided that this ethnographic method should be developed after the soundwalks.

The two research tools used for this article were the following:
a) intensive listening through soundwalking: a type of soundwalking was held in the city centre of Nicosia in Cyprus and the city centre of Valletta in Malta correspondingly by each author-as-a-researcher of the article. Through this procedure, the characteristic sounds of the places under study were outlined. The soundwalks were conducted on a sunny morning, in both areas, in October 2014 and lasted about 30 minutes each.
b) The individual in-depth interviews: A series of in-depth interviews was applied to inhabitants of the city centre of Nicosia and Malta. Hence, the results were able to provide the researchers with the way people connected with the existing sounds, but also the ones which they can recall.
The sample: Both series of interviews were conducted during the summer of 2014 using an interview guide with common elements, regarding the inhabitants' connection and meaning given to their soundscape and place, sounds they recall and emotions towards what they hear. Among others, participants were asked to recall the sounds they remembered from past years, how they heard the sound change over time and how the soundscape in their area sounds to them now. They were also encouraged to talk about the sounds they would want to preserve, treat or eliminate.

The Data Analysis Method: Our research lens focused on the participants' statements concerning their views and experiences related to the following thematic axes: traffic, machinery, human voice and other, uncategorized sounds which evolved from the discussions. Transcribed interviews were analysed on the basis of thematic axes corresponding to our research questions (Miles & Huberman 1994). Moreover, the method of constant comparative analysis was used to highlight commonalities and differences among the different responses (Glaser & Strauss 1967). The participants' responses were examined with regard to their correspondence to (a) the sounds they define as characteristic, and (b) the sounds they can recall from the past.

Intensive listening through Soundwalking

A soundwalk in Nicosia (Christidis 2014) begins from Paphos' Gate, in the western edge of its southern part. Leaving the traffic of the busy streets behind, the listener enters a silence which is only broken – in terms of the ambient sound – when s/he arrives at the cross point. Until then, his/her footsteps on the narrow roads mix with the ones of few passers by, some of them talking on the phone, or some kitchen sounds from the interior of a balcony with open doors. Arriving at the busy cross point, voices of tourists and locals intertwine with the loud sounds of children and their parents moving around. Crossing the borders, the sounds resonate the activity inside and in front of the checkpoint offices. The sound of the stamps and the 'queuing' activity is eminent, as many times even a group of tourists might stand and patiently check in or out, marking its presence while waiting with their mother tongue's sound – English, German, Russian or Italian. Entering the northern part and heading east, the listener/walker distinguishes more dusty qualities on the roads, and a silence that is broken by the sound of the mechanic shops, car repairs or metal shops, located next to the walker or in more distant places. In the western part of the northern city centre, the

sounds of the market and people shopping or selling their stuff, dry out in the areas where clothes hang on the two sides of a small street, and resonate more freely some meters away. Crossing the borders on the way back to the south, and walking on the western part of this side of the old city, the taverns and coffee shops are so numerous, that one can feel the sound of the people and customers very intensely. The yard of the church is also a place for teenagers, and after crossing it, one can find him/herself in quiet areas, where the ambient city sound is almost unnoticeable and the song of the birds dominates. During the day, one might hear the hodja's call to prayer, the sound of the church bell and other religion-related sounds, such as the liturgy, a prayer, or the sound of the people who gather on the occasion of a ceremony. In many cases, one can listen to these sounds simultaneously.

Figure 1. Map of the Soundwalk in Nicosia (Google Maps, 2014)

A soundwalk in Valletta also begins from the immediate area outside the city walls, where the main bus terminus is, and one can hear buses leaving and parking constantly. The sound of spraying water from the Triton Fountain situated in the middle of the terminus covers the noise of the bus engines. All along the terminus area, there are kiosks selling food and drinks and people who are hanging around them chatting loudly. We walk over the bridge and venture into the city. There is a wave of people walking in either direction and one manages to hear bits of conversation. One can hear Maltese, English, Italian, Spanish, French, Russian, Serbian, African languages, probably Somali or Sudanese or some other. Passing the gate, on either side of Republic Street are two flights of stairs that go to the left and to the right away from the street. The din of chatter, footsteps and construction noise coming from the new parliament building that is still under construction, hangs in the air. Walking further down this main road, one can hear the odd busker. Peruvian pan pipes, acoustic guitars, opera singers, violinists, piano accordions and even an upright piano in front of the law courts where any passer by can sit down and play. And just across the piano, there are people who make and sell handcrafts. The musical fountain at St. Georges Square pulsates in rhythm to the music being played, accompanied by the gleeful laughter of children as they run through the

water and parents snap photos or capture the fun on video. Walking away, one hears a car coming down one of the narrow side roads and turns down into Republic Street. The car passes and beeps its horn due to the amount of tourists and locals crossing at this point. Walking further down the road, the noise of the busy commercial and tourist part of the city starts to fade into the background and the street becomes quieter. There are steps that lead down the pavement and one can hear the irregular sound of footsteps due to the size of the steps which are low but long, not permitting one to go up or down in the regular sequential order of left and right. The rhythm goes: – down, step, step, down or up, step, step, up. The bottom of the Republic Street meets the surrounding ring road, which goes all around the city. One can hear coaches, mini vans and taxi's whizzing by and the sound of horse and coach is a common sound characteristic in this part of the city. The Cabby calls to the passing tourists in a distinct tone and a broken English accent to see whether they want to tour around the city by horse and coach and that it will cost a certain amount of money.

Figure 2. Map of the Soundwalk in Valetta

Similarities in Nicosia and Valletta soundwalks: between urban sound qualities and complexities

The traffic sound qualities in both Nicosia and Valletta appear to vary: in small distances, areas with heavy traffic can be replaced by other, more silent ones, where only pedestrians' activities take place. The locals tend to walk faster than the lounging tourists who are sightseeing and experiencing the world at a different pace. The voices of tourists are distinct in both cases, as they stand out, being foreign languages from the everyday ambience. Along with the tour groups walking by, one can hear the tour guides shouting above all the noise and talking about the Presidents Palace in Valletta or the Monument of Peace in the cross point of Ledra's Street either in Spanish, French

and Italian. There are also a number of different rhythms; in the footsteps, the chatter and the activities, their sounds intermingle with the ones of the local, open-air cafés, like in Republic square in Valletta or in Ledra Street in Nicosia. Along with these, music is present during the soundwalks: from small radios in modest workplaces to powerful hi-fi systems resonating in modern fast-food restaurants or cafés, one will surely notice the existence of commercial music or radio voice in various spots spread along the area.

<table>
<tr><th>Sound Concepts</th><th>Nicosia</th><th>Valletta</th></tr>
<tr><td>Silence</td><td colspan="2">sporadic silent spots</td></tr>
<tr><td>Noise</td><td colspan="2">construction & rehabilitation Works</td></tr>
<tr><td rowspan="2">Traffic sound</td><td colspan="2">sporadic horns, cars, buses & truck sounds</td></tr>
<tr><td></td><td>horse & coach</td></tr>
<tr><td rowspan="2">Human Voice</td><td colspan="2">chatters, talking on the phone, various languages (immigrants & tourists)</td></tr>
<tr><td>children & teenagers in yard</td><td>children around the fountain</td></tr>
<tr><td>Sounds from interior spaces</td><td colspan="2">radio devices/machines in workspaces/talks</td></tr>
<tr><td>Market sound</td><td>open-air and closed market of traditional character</td><td>commercial centre</td></tr>
<tr><td>Religious Sounds</td><td>church bell & hodja's call to prayer</td><td>church bell</td></tr>
<tr><td>Buskers' sounds</td><td rowspan="2"></td><td>constant presence</td></tr>
<tr><td>Water sound</td><td>fountain</td></tr>
</table>

Table 2 Sound Components of the soundwalks in Nicosia and Valletta

The inhabitants' Urban Sound through Interviewing

A series of eighteen in-depth interviews (n=18) were carried out in the two Mediterranean urban places: half of the interviews were conducted with people who live in the city centre of Nicosia, and the rest of them with the inhabitants of the cityscape in Malta.[1] The interviewees will be referred to as N1-9 for the people who live Nicosia and M1-9 for Malta's residents.

traffic

In Nicosia, the sound of traffic appears to be of major importance, as, in the interviews, sounds referring to vehicles were often described. N3, N2 and N8 described the sound of it stating that machines and some motorcycles along with cars are audible, especially when a traffic jam happens, as there are one-way streets that result to a dead-end on the wall. Extracting similar data from the soundwalk, the specific area can be imaginably divided into smaller parts, where someone could distinguish a place characterised by heavy or light traffic sound, often disturbed by a sudden barrage of noisy vehicles.
N6 expresses her disturbance by the motorbike sounds, while N7 recalls his baby daughter being woken up in the middle of the night by the loud exhausts of motorbikes passing by her window. The sound of the horn is paradoxically praised by N8, who shows sympathy towards it:

> "Disturbing car horns don't disturb me… I don't know, I like the horn. Me too, when I drive, the hand… [showing his hand on the horn button]. If I could, I would have it pressed and I would keep on driving…"

In the same attitude, inhabitants of Malta commented negatively on the traffic noise. It was described as annoying and causing displeasure: Every interviewee described an increase in traffic over the years. Interviewees M3, M5, M6 and M8 described how traffic increased in their areas due to shops opening next to residencies, while M1 and M4 described how the displeasing low rumble of trucks, coaches and buses would go through the walls. As M1 described it:

> "Since all the traffic goes around the ring road (of Valletta) you get a lot of trucks, vans and heavy vehicles and the low vibration from their engines can be felt going through the walls. It is an unpleasant sound!"

Other interviewees described how traffic increased due to shops such as grocers, take aways, stationers, confectioneries and other convenience stores. Anyhow, both cases' inhabitants detest traffic sounds, especially their appearance in a dense form, whereas they highly appreciate their absence, when this happens.

machinery

In the city centre of Nicosia, there are sporadic construction works, which resonate during the working hours. This sound ceases when the works are finished, but there are still workplaces using heavy machinery and noisy tools, to repair cars or construct metal or wooden stuff. N9, a worker in the area of interest states that:

> "the only sound I hear is my own machines… When those work, no matter whether there are other noises around, you don't get to hear them. And even after you switch it off that sound stays in your ears for a long while."

In Malta's case M6, M7 and M8, described construction sound and showed their displeasure towards the loud, metallic sounds that often vibrated through their homes and was constant throughout the days. Construction sounds are temporary since they are only present when new buildings are constructed in the vicinity or when road works are taking place. M4 described how the sound of the Freeport becomes amplified when the wind is blowing from that direction.
In both cases, machinery sounds are present – should these concern workshops, repair-shops, construction, or airplanes crossing the air, the human-as a machine operator-presence is evident, and characterises a part of the identity of these two urban areas.

human voice

The main characteristics of human voice that were identified were in both cases were: People talking on the streets, Children playing and Street vendor calls.
'People talking on the streets' refers to people who see each other walking by and stop for a chat, or people who pass by and their voices resonate in the space. The conversations are described as sometimes being heard in the interviewees' house, as in M2's case, where it was described that even being two storeys away from the road the conversations are so loud that M2 knows exactly what is being said. He describes:

> "I get to know all the news of the town. They shout so much that you can hear every word they are saying. In Qormi (town) people are very loud…".

Similarly, in Nicosia's city centre, N3 declares to be able to listen to the dialogues taking place out of his shop.
M1 described how one could hear the many different languages (English, French, Italian, Polish) being spoken by the numerous tourists walking by on the streets and sat down at cafés and bars. N2, a worker in Nicosia in the tourism industry not only stresses the existence of such languages in his place, but also mentions the sounds of the languages of the immigrants: Sri-Lankan, Pakistani, Bulgarian are heard in the city centre of Nicosia, while in Malta the presence of Somali, Sudanese and Nigerian is distinct.

The sound of Children playing and running about in Malta has become a ghost of the past. All interviewees described how years ago the sound of children playing outside was common. As the years passed this activity slowly came to an end. In the case of M5 and M7 they described that they still hear children playing in the School Playgrounds that are close to their homes, but they do not hear children playing outside the school playgrounds any more. On the contrary, in the city centre of Nicosia, the sound of children playing is still present, mostly where schools have an open playground. N2 and N4 would also state their annoyance by their shouting and their voices, N1 argued accordingly for the adolescents making noise when gathering:

> "Anarchists, who make events, they make… they gather here… in general the place is open for all these… who either we want them or not, we have to live with them".

Instead, N9 would describe their sound presence as something pleasant with a vital role in the area.

Street Vendor Calls all had their own specific sound where they would call out what they were selling in their own way. M6 and M7 described how they could never comprehend what it was that the street vendor was actually saying, but they could recognize him from his actual call. Maltese interviewees preferred the old, traditional way where the street vendor would use his own voice rather than the 'hi-tech' approach, with the use of loudspeakers. Specifically, M4 notes:

> "I remember the street vendors all around the town square all selling their stuff and shouting out with their voices across the town square. But then they started using loudspeakers and it wasn't the same. They should go back to using their voices. It had a lot more character".

A complaint on the use of the speaker is also expressed by M6:

> "The street vendors used to come round to our street selling fish, vegetables, bread and all sorts of things, it was a nice to hear them call and all the different calls too. They are not so frequent now and a lot of them use those speaker things and they don't sound the same. The real shouts sounded like something more authentic and traditional".

In Nicosia, it has been observed that a speaker is rarely used. Without any electronic amplification, and with the sound of the cart he is pushing following him,

> "Mahallebici, Sulu Mahallebici"[2]

is what a street vendor shouts when selling this warm drink in the northern part of Nicosia, as N9 indicates. Also, M2 comments:

> "I remember the street vendors and how they all used to sound their horns and shout with their unique calls. Nobody could really understand what they were saying, but you could tell who was selling what from the way the shouted (laughs)… Then they advanced in technology and they started using loud speakers and guess what? It made it even worse because you couldn't understand what they were saying more than before (laughs)…".

other sounds

Animal Sounds: A sound which is no longer heard in the towns of Zabbar and Ghaxaq is the sound of a farmer walking through the streets with his herd of sheep or goats. The sound of hooves, the odd bleating and the bells tied around the necks of all the animals was always accompanied by shouts and whistles of the farmer who kept the herd in

place with his certain commands. Both M7 and M8 described how they would wait for the farmer to pass – accordingly, in the city centre of Nicosia, the sound of farm animals is remembered with nostalgia by N6, who mentions the past presence of chickens and cows around the neighbourhood.

Religious Sounds form a category that is often observed and commented during the interviews. In Nicosia, the resonance of both church bells and the hodja's call to prayer are prominent. N2 indicates:

> "Sometimes, the imams are praying here from minaret, but very near from south, just hundred yards away from here, sometimes we hear the bells over here. It's a cultural mix over here, you know, so as long as it's not too much every time noisy, it doesn't give you a problem".

The sound of the church bell is regarded as a timekeeper for both case studies. M8 and M9 report the time keeping role of the bell, while N6 and N7 from Nicosia immediately connect everyday activities with its regular appearance on the sonic environment. In Malta, M7 comments on the role of time keeping:

> "The Church bells keep the time. I think they are important because you can plan your day around them especially since there are different chimes for different times of the day".

Assuming the data that were generated by the interviews, regarding the sounds that appear in the areas under research, the following table is generated:

Sound Categories	*Nicosia*	*Malta*
Traffic	sporadic traffic jam, low rumble, motorbikes	
		heavy traffic
Machinery	machines from the workplaces	heavy construction
		aeroplanes
Human Voice	street chats foreign languages (tourists and immigrants) people talking on the streets/balconies/public space	
	radio voice presence	
	children playing/teenagers hanging around	
	street vendor calls	
Animal Sounds	dogs & cats	
Religious Sounds	church bell	
	hodja's call to prayer	

Table 3 Sound categories as formed through the interviews

Results and discussion

Detrimental sounds that seem to disturb people are mostly the ones caused by the resonance of urban traffic, especially when this is characterised as 'loud' to the ears of the inhabitants. On this, one could say that the constant presence of the lo-fi sound environment in the areas under study appears noticeable and disturbing, however not as disturbing as the frequent appearances of loud exhausts of specially modified motorcycles. Traffic, however, through its sound appears to declare human presence in the area, and this on a few occasions is regarded as something comforting for some people, as the analysis has shown. Nonetheless, one cannot say that the soundscapes, as described by these eighteen interviewees, approach a silent character in both Mediterranean urban areas of interest. On the contrary, a variety of sounds contribute to a loud and noisy soundscape. Supporting this discussion, N8 at a certain point claims accordingly:

> "I believe us Cypriots are villagers in general, I cannot explain this, not the kind of the villagers who come from the village. Villagers, in a sense that we like the fuss, we like noise".[3]

This statement not only encourages a perception of people desiring action to be declared through sound, even if this is a loud car horn, but also pictures a tension in the Mediterranean cityscape, where many sound sources are often based on this culture.
Either the sound of construction works, specialized machines in workplaces or rehabilitation works, machinery sounds emerged often in both places. Heat is an

important factor that should be taken into account at this point. Were the overall temperatures lower, people would spend more time inside their residencies/workplaces, detached from the external sound. It seems that the centre of Nicosia appears to keep some more traditional 'silent' elements compared to Malta's soundscapes, mainly in terms of the nature of the vendor calls, construction and traffic qualities. One could not disregard, however, the role of the church bell, in both areas, and the hodja's call to prayer in the case of Nicosia, sounds which often function as clocks modulating everyday life.

Conclusion

This article used a qualitative research of the soundscapes of two contemporary urban areas with similar geographical characteristics in the area of the Mediterranean region, and moved towards a definition of the relation of their inhabitants with the sounds. The description of the sonic experience demonstrated two rich-in-variety soundscapes, characterised by common elements and sound textures. The sounds of the church bells, the street vendors or more intensively, the traffic itself were discovered to be distinctively audible in both research areas, even if the two cases are not characterised by the same sound qualities. However, during the soundwalks, distinctive sound features emerged that seem to fit a format of an emerging contemporary urban sound environment. Qualitative accuracy regarding the research questions was followed by the realization of in-depth interviews with the inhabitants of these urban places.

Traffic, tourists, children and machines are proven to generate vital sound elements of the everyday experience, while religion-related sounds are also distinctive, and seem to be able to characterise people's bonds with the place. Also, as shown, sounds that have now disappeared and remembered in the interviews appear able to provoke discussions around this matter too.

The way inhabitants describe noise qualities, noise levels and detrimental or characteristic sounds of contemporary Mediterranean urban places and connect to them, their non-verbal behaviour included, shows an attitude of paying attention and satisfaction, also regardless of the disturbance some of them might cause. Most importantly, the article traced elements of homogeneity in the soundscapes of the two areas under study, and outlined the cases where the sound qualities were different.

The material presented in this article aims at an in-depth appreciation of the findings which would provide a social, ethnological impression of the Mediterranean, what it sounds like and how its inhabitants live in relationship with these sounds. In such context, determining possible further research actions based on the outcomes of the article, future research could be well organised having a study team at its centre, which would delve into the investigation of sound in the general area of the Mediterranean, using qualitative ethnographic methods to realize similar studies across its cities.

Footnotes

1. The data gathered for this study was a part of Christidis' doctoral on-going research on the soundmarks of the city centre of Nicosia, and the continuation of the pilot project of the Maltese Soundscape, which was the basis for the research of Quinton & McGregor (2014).
2. Mahlab: aromatic spice, made from a species of cherry, used in Middle Eastern countries.
3. The word "villager' in the Cypriot dialect is not only used in order to describe the origin of a person i.e. an individual residing in or coming from a village. It is often used in a pejorative sense, aiming to attribute the characteristic of "loudness" referring to the "loud" people coming from a village.

References

2000, N. (2009). *Natura 2000*. European Environment Agency: http://www.eea.europa.eu/data-and-maps/data/natura-5#tab-european-data, Accessed 4 January 2015

Augoyard, J.-F., & Torgue, H. (2005). *Sonic Experience. A Guide to Everyday Sounds*. Quebec: McGill-Queen's University Press.

Amphoux, P. (2003). L' Identité sonore urbaine. Une approche méthodologique croisée. In G. Moser, & K. Weiss. Paris: Armand Colin. P.

Amphoux, P. (1993). *L'identité sonore des villes européennes – Tome 1: Techniques d'enquêtes [The sonic identity of European cities – Tome 1: Survey Techniques]*. Centre de Recherche sur l'Espace Sonore et l'Environnement Urbain, École d'Architecture de Grenoble and Lausanne: Institut de Recherche sur l'Environnement Construit, École Polytechnique de Lausanne, Grenoble.

Bull, M. (2001). The World According to Sound. Investigating the World of Walkman Users. *New Media & Society , 3* (2), pp. 179-197.

Bezzina, S. (2010). The sound of space. A study on the relationship between music and architecture. University of Malta.

Blesser, B., & Salter, L.-R. (2007). *Spaces speak, are you listening?* Massachusetts: The MIT Press.

Böhme, K., Hanell, T., Pflanz, K., Zillmer, S., & Niemi, P. (2009). *ESPON Typology Compilation. Scientific Platform and Tools 2013/3/022*. ESPON & Spatial Foresight GmbH.

Braudel, F. (2001). *The Mediterranean in the Ancient World*. London: Penguin Books.

Bretagnolle, A., Delisle, F., Mathian, H., Lizzi, L., Guérois, M., & Averlant, G. (2011). *LUZ Specifications (Urban Audit 2004)*. Paris: European Union.

Chambers, I. (2008). *Mediterranean Crossings: The Politics of an Interrupted Modernity*. Durham: Duke University Press.

Christidis, Y. (2014). Soundmarks in Place: the Case of the Divided City Centre of Nicosia. *Invisible Places* (pp. 392-402). Viseu: Jardins Efémeros.

Farina, A., Buscaino, G., Ceraulo, M., & Pieretti, N. (2014). The Soundscape Approach for the Assessment and Conservation of Mediterranean Landscapes: Principles and Case Studies. *Journal of Landscape Ecology , 7* (1), pp. 10-22.

Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory: strategies for qualitative research*. New York: Aldine de Gruyter.

Gobo, G. (2008). *Doing Ethnography*. London: SAGE Publications.

III, E. B. (2010). The Deep Structures of Mediterranean Modernity. In B. Kolluoğlu, & M. Toksöz, *Cities of the Mediterranean. From the Ottomans to the Present Day* (pp. 198-204). London & New York: I.B. Tauris.
Iscen, O. E. (2014). In-Between Soundscapes of Vancouver: The newcomer's acoustic experience of a city with a sensory repertoire of another place. *Organised Sound , 19* (2), pp. 125-135.
Hepcan, S., Hepcan, C. C., Kilicaslan, C., Ozkan, M. B., & Kocan, N. (2013). Analyzing Landscape Change and Urban Sprawl in a Mediterranean Coastal Landscape: A Case Study from Izmir, Turkey. *Journal of Coastal Research , 29* (2), pp. 301-310.
Kang, J. (2007). *Urban Sound Environment*. New York: Taylor & Francis.
Krause, B. (1987). Bioacoustics, habitat ambience in ecological balance. *Whole Earth Rev , 57*, pp. 14-18.
LaBelle, B. (2010). *Acoustic Territories Sound Culture and Everyday Life*. New York: Continuum.
Leontidou, L. (1990). *The Mediterranean city in transition. Social change and urban development*. Cambridge: Cambridge University Press.
Noise. (2014, October 30). Retrieved December 21, 2014, from European Commission: http://ec.europa.eu/environment/noise/home.htm
Miles, M., & Huberman, A. (1994). *Qualitative Data Analysis: An expanded Sourcebook*. London: Sage.
Quinton, M., & McGregor, I. (2014). An Introductory Study of the Maltese Soundscape. *Invisble Places*. Viseu: Jardins Efémeros, pp. 34-59.
Pijanowski, B. C., Villanueva-Rivera, L. J., Dumyahn, S. L., Farina, A., Krause, B. L., Napoletano, B. M., et al. (2011). Soundscape Ecology: The Science of Sound in the Landscape. *Bioscience, 61* (3), pp. 203-216.
Salvati, L., Zitti, M., & Sateriano, A. (2013). Changes in city vertical profile as an indicator of sprawl: Evidence from a Mediterranean urban region. *Habitat International , 38*, pp. 119-125.
Schafer, R. M. (1977). *The Soundscape. Our Sonic Environment and the Tuning of the World*. Vermont: Destiny Books.
Semidor, C. (2006). Listening to a City with the Soundwalk Method. *Acta Acustica united with Acustica , 92* (6), pp. 959-964.
Solly, I. (2012). *International Comparative Report. MICE Tourism in Malta and Cyprus*. Case Studies in International Tourism.
Sterne, J. (2012). *The Sound Studies Reader*. (J. Sterne, Ed.) London: Routledge.
Turok, I., & Mykhnenko, V. (2007). The trajectories of European cities, 1960-2005. *Cities , 24* (3), pp. 165-182.
Tixier, N. (2002). Street listening. A Characterisation of the Sound Environment : the "qualifed listening in motion" method. (H. J. Wagstaff, Ed.) *Soundscape studies and methods* , pp. 83-91.
Truax, B. (1984). *Acoustic Communication*. New Jersey: Alex Publishing Corporation.
Truax, B. (1999). *Handbook for Acoustic Ecology*, http://www.sfu.ca/sonic-studio/handbook/Sound_Signal.html. Accessed 24 April, 2013
Westerkamp, H. (1974). Soundwalking. *Sound Heritage , III* (4).
Wissman, T. (2014). *Geographies of Urban Sound*. Surrey: Ashgate.

Bio

Yiannis Christidis has studied Cultural Technology and Communication at the University of the Aegean and holds an MSc in Sound Design from the University of Edinburgh. He has designed sound and music for audiovisual products, web applications, radio productions and theatrical activities. His research focuses on the relationship between sound and image, soundscape studies, sound culture, noise and their effects and applications through new technologies and the internet.

Michael Quinton is a Sound Designer and Sound Engineer, and holds an MSc in Sound Design from Edinburgh Napier University. Michael has worked on sound designs for Theatre Plays and sound installations and has also worked on sound designs and composed music for short animation films and documentaries. Michael has also conducted a soundscape study on the Maltese Soundscape and has also worked on sonification for a planetarium. He is currently conducting research on Sonification at Edinburgh Napier University.