A SOUND-BASED EDUCATION

For Listening, Appreciating, and Co-creating The Soundscapes We Live In

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Erasmus+ Program K2 "Strategic Partnership"
Project: 2016-1-FR01-K204-024001

Funded by the Erasmus+ Programme of the European Union.
This project has been funded with support from the European Commission.

First published: 2019
Electroacoustic Music Research and Applications Laboratory [EPHMEE]
Music Department, Ionian University, Corfu, Greece.

ISBN: 978-960-7260-67-3

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Acknowledgements

We wish to express our gratitude to all the individuals who in various ways have assisted in the realization of this book. We would like to thank Elina Kalampokini for her contribution in organizing the educational activities and designing and implementing community programs that fostered listening to soundscapes in Corfu and in Lisbon, Portugal as well as Dimitris Savva who was instrumental in the organization of the closing Dissemination Symposium of the Program Erasmus+ *The Soundscape we live in* which took place in Corfu in June 2019. Also, thanks to Nikos Koskinas for the administration of the Project. We also thank Alekos Vlassis and Sofia Vareli from the 'Centre of Environmental Education in Corfu' for their collaboration and for hosting several of our educational activities, as well as Marina Papasotiriou and the 'National Gallery of Greece - Corfu Branch' for hosting the Summer Academy of 2019 and several other music activities. Thanks are also extended to the undergraduate and postgraduate students of the Department of Music of the Ionian University and to the participants of the Summer Academies in 2017 and 2019 (Ionian University), for contributing material they created in the context of this Erasmus+ Program, and allowing us to test our educational approaches and resources as they were being developed.

Through this Erasmus+ Program we had several opportunities of collaborating with Carole de Haut-Darwiche, composer and music educator from Lyon, France, to whom we extend many thanks for sharing her ideas and experiences on ways to cultivate creativity in young children and foster the development of their musical skills. The reader can be introduced to her teaching approach as well as to the innovative projects that she initiated or supervised in the context of this Program at the site of EYEL, part EYEL 2.

Special thanks to Katerina Tzedaki for her assistance in the writing of Chapter 5 and more specifically in the section that refers to soundscape analysis. We would like to also express our sincere gratitude to Miranda Caldi for her essential contribution in proofreading the book, but also for being the first academic colleague in Greece who introduced us to the work of Murray Schafer almost two and a half decades ago. Last but not least, we would like to express our most sincere thanks to Regina Saltari for her assistance in testing and implementing the *BEAVER* educational approach and the supervision of students' projects. Her input and assistance has been also invaluable in the translation, editing and proofreading of the present publication. We thank very much Roula Efthymiou and Christiana Adamopoulou for their useful observations about this text.

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Corfu, 17/7/2019

Introduction: Apus the Ambassador

Ioanna Etmektsoglou

Apus apus, Κοινή Σταχτάρα in Greek, the *Common Swift* in English, is a bird very prominent in the soundscape of the old town of Corfu from early Spring to late Autumn. Yet, it took me almost twenty years to really notice it. When I finally happened to learn about Apus apus, through studying its sounds, its flight, its ways of being and surviving here in Corfu and in its second homeland in Africa, I only then really noticed this bird. At that point, something amazing happened. As I was following Apus apus' frantic journeys up high in the sky with my ears and eyes, my world became larger, as a sphere that had expanded beyond its former limits. My world since then has included not just the tops of the tall trees around me but also the far places of the sky. These, I did not ever own as mine, until my new flying ambassador, Apus apus, was up there attracting my attention through its voice. The following chapters are an attempt to use sound as a means to create more 'animal ambassadors' in the soundscapes we live in, ambassadors who will augment our understanding and appreciation of our small and wider outer and inner worlds. But what are the soundscapes we live in in European countries (France, Greece, Italy, Portugal) in contemporary times?

The aim of this book is to share methodology and teaching approaches as well as to provide indicative resources that will enable students of all stages of life to develop a better understanding of their home soundscapes as well as of the soundscapes from three other European countries. The soundscapes presented in this book cover a spectrum, which extends from rather nature-dominated habitats to primarily machine-dominated habitats. Certain traditional songs and unique place-specific language idioms, or instrumental timbres and practices -given their close connections with local soundscapes as sources of inspiration- will also be presented in this book (see Dionyssiou, Chapters 3 and 6, and Etmektsoglou, Chapter 7). More specifically, the themes addressed are organized in two main parts. Both parts are explicitly or more implicitly related to listening practices connected with soundscape awareness. However, the first part focuses more on theoretical and methodological issues of an education focused on soundscape awareness and the second part presents projects and activities focusing on soundscape awareness, placing an emphasis on those carried out from 2017-2019 at the Ionian University. The second part is followed by four Appendices, which include a large variety of supplementary material for the seven chapters of the book. A short outline of the chapters follows.

Outline of the Book.

The book is comprised of two Parts, four Appendices and a Glossary.
Part One introduces the reader to Theory and Methodology for Soundscape Awareness in Education.
Chapter 1 by Ioanna Etmektsoglou is a short historical review of the major social, technological and artistic developments that have contributed to major changes in our contemporary European soundscapes and the relevance of including soundscape studies in music education.
Chapter 2 by Ioanna Etmektsoglou presents the author's perspective on an educational approach, which is informed by Acoustic Ecology and is intended for inter-generational groups. In this chapter, the reader will find a presentation of a number of ways of listening to soundscapes with accompanying suggested exercises, including comments for their implementation and suggestions for educational extensions.
Chapter 3 by Zoe Dionyssiou discusses a music education developmental perspective. In this chapter the reader will find the description of a pedagogy of listening in music education which aims to propose ideas and methods for the creative use of soundscapes in the music class.
Chapter 4 by Ioanna Etmektsoglou presents the 'BEAVER' model, an educational framework for approaching an animal in its particular ecosystem and soundscape.
Chapter 5 by Ioanna Etmektsoglou introduces the reader to the practices of s*oundscape analysis, improvisation and performance, as a creative learning cycle,* and presents a specialised approach to soundscape improvisation, the *Group Elemental Soundscape Improvisation,* which is being characterized as an 'unplugged' experiment.
Part Two is on Soundscape Awareness and Practical Applications.
In Chapter 6 by Zoe Dionyssiou it is suggested that musical traditions can be used creatively within the framework of soundscape awareness. The chapter gives examples of four Greek folk songs and ideas of how they can be used in music education following the methodology of listening previously discussed in chapter 3.
In Chapter 7 by Ioanna Etmektsoglou the reader/listener will find examples of analyses and suggested educational activities, proposed by the author, based on specific, short recordings and their accompanying documentation provided by collaborating recordists of the Erasmus+ project *The Soundscape we live in.*

The four Appendices refer the reader to material that supplements this book.
Appendix I includes material created by Ioanna Etmektsoglou. Appendix II presents related projects created by Elina Kalampokini, collaborator of the Erasmus+ Program. Appendix III has related applications by Undergraduate Students of the Ionian University, Postgraduate Students of the MA Program in Music Education at the Ionian University, and by Music Teachers. In Appendix IV the reader can read a report by Zoe Dionyssiou on the Summer Academies held at the Ionian University in 2017 and 2019, as well as a report by Andreas Mniestris and Elina Kalampokini on Junior + Teen Sonic Arts Summer Academy in 2018.
Appendices are followed by a *Glossary* by Andreas Mniestris, which is a collection of basic definitions and/or explanations, of some terms appearing in the text of this book, which might be useful to the reader.
This e-book is a hypertext connecting words or small phrases either to internet locations or to a page within itself. The links are formatted like this (ex. "Retrieved from: thisaddress.org >" or " go to 'this page' " and ⇧ [to return from 'this page'].

Part I

THE CHANGING EUROPEAN SOUNDSCAPES AND THEIR SIGNIFICANCE FOR MUSIC EDUCATION

Chapter One

Soundscapes we live in: Europe 2019

Ioanna Etmektsoglou

Social developments in Europe and America during the last part of the 19th century and especially at the beginning of the 20th century, such as the rapid urbanization, the industrial revolution and World Wars I & II, seemed to create the need for exploring resources other than animal muscle power for transportation, work and multiple other uses. This inevitably led to a massive increase in the number and variety of machines. An important by-product of machine use, however, has been the noise produced from their operation. Ever since, this rapidly multiplying noise has been 'polluting' the soundscapes we live in. Soundscape is a term introduced to Acoustic Ecology by the Canadian composer and music educator R. Murray Schafer in the late 1960s and beginning 1970s. He defines it as "any portion of the sonic environment regarded as a field for study" (Schafer, 1977/1994, p. 274), and refers to its dramatic change of character in the contemporary western world. Writing in 1977 he comments:

> The soundscape of the world is changing. Modern man is beginning to inhabit a world with an acoustic environment radically different from any he has hitherto known. […] Noise pollution is now a world problem. It would seem that the world soundscape has reached an apex of vulgarity in our time, and many experts have predicted universal deafness as the ultimate consequence unless the problem can be brought quickly under control.
>
> (Schafer, 1994/1977, p. 3)

The soundscapes we live in today, about 40 years after Schafer's statement, are even louder. In addition to the general proliferation of machines and their often indiscriminate use by humans, rapid developments in sound technology specialized in recording, composing, reproducing, amplifying and spatialising sound, have also contributed to increasingly louder soundscapes. Contemporary soundscapes are not however only characterized by 'too much' sound in terms of high sound pressure levels (decibels), but are also characterized by what Schafer refers to as schizophonia, a phenomenon which was generated by the invention of recording and playback machines, starting with the production of the phonograph in 1877 (Schafer, 1986). Before that time, one could hear a group of musicians at a certain time if they were present physically at the concert. The invention of sound recording made it possible for the sounds created at a specific place and time to be reproduced at distant places and at any time of the day, season or even after many years[1]. The rather negative result of this otherwise important technological development, was that a listener, at any moment, could find themselves exposed to more than one, and often

1 You can listen here > to the voice of Maria Callas from a recording of 1952 of Amilcare Ponchielli's opera La Gioconda, performed by the Orchestra della RAI Torino, conducted by Antonino Votto. As you listen, think of the different place (Turin, Italy) and time (several decades ago) that Maria Callas was actually singing her part in this opera.

several, sound sources, which played concurrently music or speech from various places and styles. A contemporary Babel; such are the urban soundscapes we inhabit in today's European cities: saturated by radios and stereos blasting together in the background, on top of the constant drone of traffic noise and other machines, 'embellished' by mobile phones ringing relentlessly and airplanes booming. All these sounds, along with many others, create the ever changing macrocosmic composition (Schafer, 1994/1977) which is being performed every moment, while people are trying to have a conversation, read, even think or rest.

As the sounds of machines kept heavily invading many urban and even rural soundscapes at the beginning of the 20th century, they seemed to have influenced among others, the ears of the artists, thus creating the conditions for a change in the aesthetics of that era. It was in about 1913 when the Italian painter Luigi Russolo and other Futurists[2] expressed the need for new sounds and amplification, which could be achieved by the incorporation of the sounds of the machines and those of nature to the palette of the 'traditional' sounds of the European and American orchestras (Russolo, 1913). Machine sounds, such as the sounds of sirens, pistols, a typewriter and a foghorn found their place in mainstream concert music as early as 1917 through the ballet *Parade* by Eric Satie and in 1924 through George Antheil's *Ballet mechanique*, which included electric bells, airplane propellers and a siren in addition to many percussion instruments, pianos and player-pianos (Hugill, 2007). The strong demand towards sonic variety and amplification in music, seemed to be coupled and possibly reinforced by the continuing and rapid developments in sound-related technological products and applications, which dated back to the beginning of the 20th century and even before. The *Theremin*, a portable electronic instrument which was invented in 1919, was incorporated for example in 1934 by Edgard Varese in his composition *Ecuatorial*, while in 1939 John Cage used variable-speed turntables playing test tones in his composition *Imaginary Landscape No. 1*., along with a muted piano and cymbal (Holmes, 1985). Among the first sound-centered electrically driven inventions, a few that had a great impact on the future of music as composed and experienced are:

- the carbon microphone by Thomas Edison in 1876,
- the phonograph by Charles Cross and Thomas Edison in 1877,
- the loudspeaker by Ernst Werner von Siemens, also in 1877 and
- the magnetic tape recorder by Fritz Fleumer, several decades later, in 1928

(Collins & d' Escriván, 2007)[3]

Pre-recorded sounds entered western music as early as 1924, when Ottorino Respighi included a *phonograph* playing pre-recorded sounds in his orchestral composition *Pini di Roma* (Collins & d' Escriván, 2007). While the use of pre-recorded sounds in western orchestral music may have added variety and interest, the editing of pre-recorded sounds and their use as primary compositional material marked an important change in music history. The French composer Pierre Schaeffer[4] and other composers of the Musique Concrète approach began in late 1940s to use sound recorders to record any sounds they wished from the environment (from nature or from the city), then manipulated at the studio each particular sound by speeding it up, slowing it down,

2 See: 'The Art of Noise' Futurist Manifesto >,
also in this video > and a sample from *Corale*, a composition of Luigi Russolo >.

3 For a more detailed chronology of sound-technology related inventions and developments, you are referred to Collin and d' Escriván, (2007, pp. xiv-xxi)

4 Listen to the Études de bruits (1948) > first broadcasted on 1948.
Here is the first of the five "Études de bruis", the *Étude aux chemins de fer* >

reversing it etc. and used it as a building block for their compositions. With these 'altered' recorded sounds, composers created musical patterns and phrases. The first well know composition of this type by Schaeffer, the *Étude aux chemins de fer*, was created at the French National Radio (Radiodiffusion Francaise) in 1948 using discs and multiple turntables and mixing pre-recorded sounds (Collins & d' Escriván, 2007). The musical patterns that emerged in the composition were not intended to refer to the original sound sources, as the recorded sounds were merely used as interesting basic material to work with. Even though in this early composition of this genre many of the sound sources are recognizable, Schaeffer and other Musique Concrète composers are known for aiming to destroy the link between the sound and its source, directing listening to the sounds only as music material with no extra-musical meanings.

Such was the broadening of the music resources beyond the boundaries set by specific styles and techniques that, by the mid-20th century, music was considered to be any possible sound of the environment which the listener decided to listen to as music. This approach to music composition and listening did not reach great popularity at the time. It seemed to have been brought to the attention of a wider concert public through the performances of an unusual for its time piano composition, the *4' 33''* by John Cage, which was first performed as early as 1952. Cage's interest in expanding music possibilities for the composer and listener is evident in this three movement work, in which a soloist or a group of instrumentalists perform by not playing any notes but just by keeping silently the time of each movement until the end of the piece. In this context of the 'silent performance' the audience is encouraged to listen to and perceive for these 4' and 33'' any 'non-musical' sounds produced in the concert hall or even coming from outside as if they were 'music'[5]. Enabling an aesthetic approach to everyday ambient sounds may empower the listener to merge life with art and be able to import rich moments of aesthetic experiences from music into their everyday life activities, just by choosing to listen, at will, with musical ears and a listening body.

About 20 years later, Luc Ferrari, electroacoustic music composer, introduced the listener to this new aesthetic listening of everyday life through his seminal composition *Presque rien No. 1 'Le Lever du Jour au bord de la mer'* (1967-1970), which consists of recording the awakening of a seaside village of fishermen[6]. Along similar lines, and around the same time, we find R. Murray Schafer's approach to listening to the environment as a musical composition and his introduction of the term soundscape[7]. He also directed the World Soundscape Project, while members of his original team, Hildegard Westerkamp and Barry Truax, developed the genre of soundscape composition, which has been defined as:

> a form of electroacoustic music, developed at Simon Fraser University and elsewhere, characterized by the presence of recognizable environmental sounds and contexts, the purpose being to invoke the listener's associations, memories, and imagination related to the soundscape. It grew naturally out of the pedagogical intent of the World Soundscape Project to foster soundscape awareness (Truax, 1999)

As briefly discussed above, the century between 1870 and 1970 brought to the western world major changes in its sonic environment, novel music-related technology, 'new' sounds of music and 'new' meanings attributed to music as an art form. These changes have been introduced here only briefly as a way to set the scene for the reader to better understand their possible impact on music education. More changes were realized the following years (1970s-2019), but in a sense these

5 Here is a video > from a performance of this work.
6 You can listen to this composition here > or here >
7 Here are two videos with M.Schafer : VIDEO 1 > and VIDEO 2 >

could be understood, for the most part, as developments of the previous ones. The following could be identified as major new trends: the *portability of sound* through the development of personal listening devices, such as the tape players and later on the walkmans, the *democratization of music tools* such as music hardware and software available often free for personal computers and the *spatialisation of sound* through multiple speakers.

From Contemporary music, to Acoustic Ecology, to Music Education

The above mentioned sound-based approaches to listening and composition could potentially have a twofold effect on music education: a) a practically unlimited expansion of the sound-music creative resources available to the young and older composers, and b) an increased attention to 'listening' as a skill to be cultivated and developed in its broader sense so that it could make possible the perception of music in songs and symphonies but also in the sounds of nature and culture. The developments in Avant Garde and Electroacoustic music, however, did not appear to reach the wide general audiences in the USA, Canada and Europe beyond small groups of academics and audiophiles. Consequently, their impact on education, with few exceptions, was not so evident.

Murray Schafer in Canada and almost at the same time John Paynter in England (see the latter's book *Sound and Silence* in 1970), both being composers and music educators, attempted to create essential links between the sound-based approaches of contemporary composers and the focus and practices in music education. In fact, Schafer in the late 1960s moved a step beyond his main interests in music as an art form and in music as education to create a new link between these two fields and a third one, that of ecology. He thus founded the new academic subject of Acoustic Ecology, which according to Cummings (2001) examines:

- the role of sound in the lives of humans,
- the relationships that emerge through sounds in human and other animal species, and
- the ways in which living organisms are affected by their sound environment

It is proposed here that the incorporation of Acoustic Ecology in music education could foster a contemporary, broader approach to music, while at the same time cultivating ecological awareness and consciousness.

The approach of soundscapes as potential compositions could bring in music education a valuable perspective of time experienced, as it unfolds in all levels (micro, mezzo and macro). Most popular or traditional songs tend to last for 3 minutes on average, while rarely a symphony or opera work might last for over two hours. These time durations would place them in the meson level, leaving the micro and macro levels as unexplored territories in the realm of music education. When approaching soundscapes as music, however, the listener could be given opportunities to explore also the micro and macro levels. For example, on one end, students could explore a very short song of a bird as a music entity, or on the other, they could analyse the 'music' of a particular tree while its soundscape is changing through the time-frame of the four seasons.

Technological Developments and Soundscape Education

In our times, technology permeates European students' everyday life. A critical approach and understanding of its operation, function, possibilities, limitations and potential drawbacks, could prepare these students for more informed choices in the future, regarding issues of aesthetics and ethics as related to music creation, performance and dissemination. The use of technology may

provide them with a considerably expanded pool of synthesized or sampled timbres and various tools that could transform composition into a more accessible activity for the non-specialist. Technologically mediated music experiences, however, especially in the digital era, are not directly analogous to primary bodily experiences of producing sounds with acoustic instruments. For example, in an electronic instrument, one may produce a great change in the dynamics of a sound by applying the least physical effort in order to press or slide a keyboard button, while the same change in dynamics would require a considerable muscular effort when playing an acoustic instrument.

According to the ecological approach in child development (see Gibson, 1979; Gibson & Pick, 2000), children are active agents in their environment. Through their explorative actions, they develop the perception of affordances of the various objects around them, while at the same time learning about their own characteristics. A rich bank of experiences with sounding objects, which produce sounds in analogy to the physical efforts exerted by the child, are essential for the sound-based education of this child, but also for the understanding of oneself as an embodied perceiving agent in the environment. Therefore, technologically mediated sound or music experiences –according to the author's opinion– may not replace direct sound experimentations at any level of development, and especially so, in early childhood education. It is the responsibility of the teacher and the parent to ensure that children will be offered 'unplugged' and electrically mediated experiences in life and art, in the appropriate balance, based on their age related needs. Being immersed in sounds during all of our life, soundscapes could become a life-long resource for learning to experience places alone or share and appreciate them with other persons (humans or other species). Let's examine now how our local soundscapes may function as resources for music education.

Local soundscapes as resources for music education

Soundscapes as Music Compositions

An approach, which places the emphasis equally on the music product and on the listener who perceives it, inevitably broadens the definition of music to include not only specifically made cultural sonic products but also any sounds or sound constellations in the environment, which are perceived by the listener as music at a particular moment in time. The latter acoustic experiences, located in the places we live in, under certain listening conditions, tend to reveal perceivable sonic patterns and thus may lead the listener to subjectively identify them as 'music'. Students of different ages may be encouraged to listen to rural or urban environments as music compositions (Schafer, 1986). Such an aesthetically filtered listening approach to the environment, to its anthropophony [8], biophony and geophony (see Krause, 2012), may augment students' understanding and appreciation of the places they live in.

Soundscapes as bridges to others, to the environment and the aesthetic

The exploration of soundscapes we live in as creative resources in music education could additionally provide opportunities for establishing connections between students' listening experiences and a) their everyday interpersonal experiences, b) their understanding of and relationship with the environment (natural and constructed) and c) their aesthetic experiences

8 Krause (2012) proposes the term *Anthrophony* for all sounds caused by humans. However, because the Greek word for 'Human' is 'Anthropos' and for 'voice' 'phonee', we suggest the word *Anthropophony.* ↓

through music and movement. For the explanation of these potential connections we find useful the term *Vitality Forms* introduced by Daniel Stern (2010). According to him, vitality forms are defined as: "the felt experience of force –in movement– with a temporal contour and a sense of aliveness, of going somewhere." (p. 8). While Stern (ibid) does not support that these forms are directly based on nature (meaning the natural outside world), he recognizes a correspondence between them and nature. A musical approach in the analysis and interpretation of the sonic environment and the acoustic events that develop through movement in time could provide opportunities for the students to develop a repertoire of various acoustic energy contours. This repertoire may include a number of graphic descriptions of bursting sounds, sliding sounds, accelerating sounds etc. These acoustic energy contours, the *sonic envelopes,* or the *life of single acoustic events* (as approached by Schafer, 1986), once perceived, could be used as material for creative explorations of their correspondence with *vitality forms* in thoughts, emotions and actions. Students could experiment with the feeling of a burst of anger and with the kind of sonic contour, which would express this suddenly emerging emotional state. Experimenting with various kinds of sonic envelopes, which are generated in our soundscapes, and realizing the correspondences with analogous *vitality forms* in human expression and communication may lead to improved understanding of other humans who we engage with when communicating.

The discovery of similarities in *vitality forms* as expressed by humans and other animals, through the ways they move, react to stressful situations, play etc., may enhance the understanding and appreciation of these animals as persons. Hearing, for example, a dog's cry and realizing that the way this cry begins and develops in time in terms of its energy and pitch contour corresponds with the vitality form of a human's analogous cry, may reveal a sense of relationship and 'common fate' which could potentially enhance the possibilities for a positive identification with this animal and the development of an inner natural need to protect it (see also the model 'BEAVER', in Chapter 4).

From an aesthetic point of view, the exploration of correspondences between sonic energy contours emerging from our soundscapes and vitality forms, could be moved beyond everyday communication to reach the area of the time-movement based arts, such as music, dance, theatre and cinema. In these art forms, the vitality forms are not occurring naturally but are created and crafted by the artist. Students, having realized these correspondences between sonic energy contours and vitality forms in real life, can now practice in recognizing these analogies in music compositions or even applying them when creating their own music. However, the cycle does not end here, as the 'filtered' vitality forms recognized in music as new knowledge may now lead to a refined perception of the real-time soundscapes that the students will encounter.

Soundscapes as agents for life-long intra-personal development

While children aurally explore the environment as active agents, they discover things about the outer material world, but also about their own characteristics and affordances. Considering the close correspondence between the perception of the environment and that of the self (Gibson & Pick, 2000), a music education that fosters a sound approach to the environment may lead children beyond the refinement of their aural skills, contributing in parallel to the development of their self-perception and a deeper understanding of their own identity. However, identity formation does not end in childhood or even in adolescence, as according to Erikson (1959), it is a rather fluid sense, which potentially undergoes modification and reformation through all stages of human life. An aural/aesthetic approach to the places we live in, therefore, is proposed here not merely as a part of a music education that ends in high school, but rather as a life-long music education that begins even before birth and accompanies people throughout their life journeys.

Soundscape listening as a solitary and communal experience

Another aspect of an educational approach to local soundscapes is its possible emphasis on both individual and communal experiences. Listening alone in silence is a condition that potentially fosters a high concentration level that could lead to a detailed and in depth analysis of the auditory scene, in terms of its meanings and its aesthetic characteristics. As aural perception is not, however, universal, but is filtered by personal physiological characteristics (i.e. degree of hearing acuity), psychological parameters (i.e. prior positive or negative associations with specific sounds, mood of the moment, prior knowledge and expectations etc.), and by social/cultural characteristics (i.e. ethnic identity, other group identity etc.), listening together as a group, is also a valuable experience. As students are listening together to a specific soundscape, some of them might perceive and identify elements, which could remain unnoticed by others. By listening together in groups, students are provided with opportunities a) to perceive more or different information in successive related listenings, b) to realize the existence of degrees of physiologically determined hearing acuity (severity of hearing loss) in various people, and its effects on everyday life, c) to understand that *hearing* is not the same concept as *listening*[9] and that the latter is an active process influenced by psychological and social/cultural parameters and d) to correct, refine or augment their understanding of the places they live in through taking into consideration the aural information perceived and shared by all members of their group.

As can be inferred from the above, the soundscapes we live in may in many ways enrich a traditional music education program a) by making available a different mode of experiencing and understanding the places which we inhabit, yet tend to ignore, b) by functioning as bridges between the self and the other, the self and the environment, the everyday experiences and the aesthetic experiences, c) by contributing to the life-long development of intra-personal awareness and identity formation, and d) by offering opportunities for solitary and communal experiences. Without undermining the importance of 'classical' compositions, which were created during the long history of western tonal music, it is argued here, that contemporary music education could benefit from a critical yet inclusive approach to *the soundscapes we live in* as teaching material. As it is shown in the following chapters, it could also benefit from a similar approach towards a variety of music genres and mediums, including electroacoustic music, soundscape compositions as well as towards sound-related scientific fields such as those of acoustic ecology, bioacoustics, acoustemology, and soundscape ecology.

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Chapter Two

Listening to Soundscapes as an Acoustic Ecologist

Ioanna Etmektsoglou

I believe that the way to improve the world's soundscape is quite simple.
We must learn how to listen.
(Schafer, 1992, p. 11)

Listening is placed by Schafer (1992; 2005) and Westerkamp (2001) at the centre of an approach, which aims to improve our soundscapes in terms of beauty and the underlying ecological balance. It is an essential skill, which ought to be given primary importance in music education. Schafer himself invented creative aural exercises for the development of 'clairaudience' through 'ear cleaning' (Schafer, 1994/1977, 2005).

Especially in our times, the existing personal sound devices may divert listening away from the 'real' soundscapes we live in at any moment. According to Bull (2004), "walkman users appear to achieve a subjective sense of public invisibility. They essentially disappear as interacting subjects, withdrawing into their chosen privatized and mobile states." (p. 185). The trend pointed out here by Bull (ibid) has been growing rapidly, more so in the recent years through the use of personal mobile phones. Young and older people are increasingly becoming 'deaf' to their surrounding soundscapes, as their attention is being repeatedly and continuously diverted to other stimuli. The need for re-educating students to listen, is thus an educational, ecological and social imperative. Students[10] could be encouraged to develop their listening skills through engaging in various ways of listening such as:

- *Listening for sound-sources and meanings*
- *Listening for physical characteristics of sounds*
- *Active Listening*
- *Listening as a Tourist*
- *Listening for diagnostic purposes*
- *Listening through a microphone versus Listening only with ears*
- *Inclusive Listening versus Exclusive Listening*
- *Listening with the body*

10 Here is an introductory exercise ('Listen! Listen and…' Card Game) > which aims to encourage students to understand that we might perceive different things depending on the way we listen. Every student takes a card with listening instructions and the group listens silently for 1-3 minutes depending on age. Then they discuss what everyone heard and to what extent this was the same or different from what others heard.

These ways of listening are discussed in the following sections and specific activities are suggested for listeners of various ages and experience. The adult facilitator would be advised to choose or adapt every exercise based on the specific characteristics of their group**.**

Ways of Listening

Listening for sound-sources and meanings (Schafer, 1994/1977)

Listening for the sources of sounds is a very fundamental way of listening, a skill that has been important for the survival of humans and other species. This way of listening used to be essential for the early humans in order to find their way around the forest, protect themselves from predators, communicate with conspecifics and secure their own food. Perhaps listening for the source of sounds is less practiced in contemporary, visually biased cities, but even today, humans still need to listen and not just look in order to ensure their safety while moving around busy streets.

Photo 2.1. A young girl is trying to identify the source of sound inside the jar by shaking and listening carefully. Game conducted by Elina Kalampokini during the Summer Festival 2017 of the Alternative Laboratory in Corfu, Greece, as part of the educational activities of the Erasmus+ Program *The Soundscape we live in.* Also see here (and at Appendix II) a series of games by E. Kalampokini performed during this event.

The identification of sound sources and their localization in the soundscape is an important skill to develop; one which leads to enhanced awareness of one's environment and their connection with it. What might follow the sound-source identification is the interpretation of the meanings of sounds as explained through the following two examples:

Example a. After identifying a car as the source of a sound, one would have to realize, by interpreting its sound characteristics, whether this car is approaching or moving away from them.

Example b. In the context of a home soundscape, after realizing that it is their baby crying in the next room, a parent would try to interpret the possible meaning of the cry; would this be a pain cry, a hunger cry, or another kind of cry?

Schafer (1977/1994) proposed a terminology for the categorization of sound-sources and their meanings, which could be helpful when listening to soundscapes from this perspective.

According to this terminology, one may distinguish in a soundscape various Sound Events (single sounds or succession of sounds from a single source that are perceived as a unified whole i.e. the sound of an airplane landing). Some of these Sound Events might be intended to communicate a certain message, in which case are characterized as Sound Signals (i.e. the sound of our alarm clock that informs us that it is time to wake up), while only very few *Sound Events* might be so unique and characteristic of a particular place that would be classified as Soundmarks, in analogy to the visual Landmarks. Yet, another type of Sound Event is the Keynote Sound (i.e. the constant rambling sound of a highway road which is close to a residential area), usually a continuous sound that forms the background of our perceived soundscape, as we tend to ignore its existence most of the time, while our attention is shifted towards the changing sounds.

It is interesting to note here that the proposed sound event categorization is not absolute and universal. Depending on the listening situations, listeners' personal history and their cultural background, one listener might decide that a certain sound is a Soundmark, while another listener could classify the same sound as a Sound Signal or even just as a Sound Event. For example:

> On a Sunday morning, the deep, loud, sustained, rhythmic, unique sounds of church bells emitted from the main Christian church of a particular town, could be possibly identified as a Soundmark by a foreign visitor, while the same sounds could be interpreted as a Sound Signal by a local person who is interested in Christian rituals, as the timing and number of bell strokes could inform them about the development of liturgy, meaning whether it is i.e. towards the middle or is approaching the end. At the same time, a local who is not interested in the Christian religion and its rituals, but is familiar with the sounds of these church bells, might characterize these sounds as mere Sound Events.

Searching for the meanings that people of a particular place assign to sounds, may provide us with valuable information, which could contribute to a deeper understanding of local history. The analysis of soundscapes based on their Sound Events might begin as a simple activity, yet it could be developed into a tool which facilitates deeper discussions about the possible meanings of sounds and the state of a soundscape and the community (of humans or other species) that co-produce it. For example, a 'silent' urban soundscape could be interpreted as reflecting a human community experiencing a state of well-being and tranquillity, but also it could be understood as reflecting a community experiencing oppression or perhaps economic depression. Searching carefully for the meanings of sounds in the soundscapes we live in, could lead us, as listeners-researchers, to develop a better understanding of the special characteristics and underlying dynamics of communities, individuals and ecosystems, enable us to perform more informed evaluations of the state of their well-being.

Exercise

My circle of sounds: Visit a port during a busy time of the day. Every participant has a piece of paper and a pencil. They draw a large circle on the paper and at the centre of the circle they mark a dot, which represents their own position as a listener. The group listens attentively for 10 minutes, while everyone is marking inside their circle the names or pictures of the sources of sounds heard. The listener places every sound source inside the area of the circle in accordance to the place they hear the sound originating from. A moving sound-source could be marked more than one time, indicating its first and last position and its movement between the two, by using a dotted line. After completing the exercise, participants could discuss their sounds and then share which sounds they liked and which they disliked, and whether they thought that some sounds were too loud, thus possibly masking other softer sounds. If noise pollution would be identified, a discussion about possible solutions and actions could follow.

Comment: For a more advanced exercise, next to every sound-source, participants could mark:

a) a number between 1 and 10 (with 1 being very soft and 10 painfully loud), and
b) a characterization as follows: **SE**= *Sound Event*, **SS**=*Sound Signal*, **SM**=*Soundmark*, **KS**= *Keynote Sound*.

Listening for physical characteristics of sounds (Schaeffer, 1966, 2017[11] & Schafer, 1994/1977, 1986)

R. M. Schafer (1994/1977) introduced three different sound classification systems based on the sounds' a) physical characteristics, b) referential aspects-meanings, and c) aesthetic aspects. When he refers to the world soundscape as a *macrocosmic composition*, he seems to emphasize a musical perspective in the listening of soundscapes. This perspective places the listener at a critical stance from which they judge the Sound Events and their interactions, not based on their meanings but rather based on their physical characteristics as musical elements of a composition. Pierre Schaeffer already in 1966 had introduced the term *Sound Object* to define the smallest sound particle that is perceivable by the human ear. Schaeffer approached this based solely on its physical characteristics. While Schafer is primarily known for his interest in the meanings of sounds and in a type of analysis focused on them, the two composers seem to agree on the usefulness of analysing music or soundscapes based on the sounds' physical characteristics.

1. Listen to the lives of sounds: Every sound has its own life as it appears in the soundscape, remains present for a short or longer time, and then disappears (Schafer, 1986). This profile of energy during a sounds' life-time is called an 'envelope'. You can play many exercises based on the life of sounds. During short concentrated listenings (1-5 minutes), group members are asked to attend to the attacks of sound events and after the listening time is over, to draw and describe to the rest of the group, the attack of two or three of their sounds. Was the attack abrupt and short? Did it start very softly and slowly gained energy (crescendo)? Did it start at a medium loudness and gained energy fast? etc.

Comments: Alternatively, participants could be asked to shift their attention to the body of sound events, or to their release.

2. Listen for balance: A composer usually tries to place the sounds of their composition in ways that they will coexist well with other sounds, without being concurrently too loud to cover weaker sounds or too soft to be covered by other sounds; unless of course this is intentional. Indeed, they could decide that a section of their composition or the whole composition will not be transparent for all instruments, and some of them will have a main role while others would just be in the background. Yet, again, they could decide that all sounds will play together, 'losing' their unique identity, but creating an interesting new texture as a whole. Listen to a live or recorded soundscape as a composer and identify times of balance and transparency or imbalance and masking.

11 For an introduction to P. Schaeffer's approach to listening, see his book: Schaeffer, P. (2017). *Treatise on Musical Objects: An Essay across Disciplines.* C. North & J. Dack (Trans.). Oakland, CA: University of California Press, or the original book, which was written in French in 1966. You can also read the English translation of a related book by Chion, M. (2009). *Guide to Sound Objects.* J. Dack & C. North (English Trans.). Retrieved on 6/7/2019 from: monoscop.org >

Comments: Do you identify some sound-sources that over-dominate the scene, masking other softer sounds to a considerable degree? Or, is the soundscape balanced and transparent enough for you to be able to distinguish a variety of sound-sources in it? If you have identified one or more over-dominating sounds, what do you think it should be done about them?

Active Listening (Gibson, 1966; Clarke, 2005)

According to Clarke (2005), "When humans and other animals perceive the world, they do so actively." (p. 19). While hearing depends on the condition of a person's acoustic organ, listening depends on what this person decides or expects to hear. Listening is an active process and an ability that can be developed through explorations of the environment and through learning (Gibson, 1966; Clarke, 2005).

Exercises:
1. *Staying Still for Sound Hunting.* Listen carefully to a soundscape while being motionless and quiet and try to remember as many different sounds as possible, which you will discuss or write down after the end of the listening activity.

Comments: This exercise, depending on listeners' age and experience, could be as short as 5-10 seconds and as long as ten minutes. Take into consideration the natural tendency of young children to move in space and their difficulty in staying still and silent. *Still Listening* is a skill that may be developed through practice. It is recommended to approach the exercise not as 'punishment' but rather as a condition that will allow everyone to discover more of the tiny or distant sounds of their environment; make it a 'still' sound hunting, rather than a 'be quiet' game. If there is a group member with hearing problems, depending on the degree of hearing loss, consider introducing a hearing augmenting device, such as specialized headphones or a large drum, which the person could touch lightly to sense the sound, on its vibrating surface.

2. *On the Move for Sound Hunting.* Listen carefully to a soundscape while focusing on locating a particular sound. When you choose your sound, move without making any noise until you find and touch the source of that sound. If the source of your sound is outside the physical borders of your listening area, (i.e. a classroom), then move as close to the sound source as possible and point at it. If, as a listener, you make any noise (from shoes, clothes etc.) while moving in space, you would have to return to the starting point and try again.

Comments: The target sound could be a hidden ticking clock, a metronome, a small radio playing speech or music, a small percussion instrument played by another group member behind the listener's back, while all students pretend to play, etc. Stress the importance of the silent movement of the player. If there is a student with hearing loss in the group, ensure that the sound source is a large wooden percussion instrument such as an alto or bass xylophone, the sounds of which would be more likely within the range of their hearing sensitivity. Alternatively, its location could be found through touching different vibrating surfaces around the room.

Soundwalks. Take a silent walk following a leader and focus your attention on listening. After the completion of the soundwalk, discuss what everyone heard (the sound sources). At this point you could use nonsense speech, as well as vocal or other body-generated sounds to mimic the main

sounds heard during the soundwalk[12]. Discuss the meanings that different participants might have assigned to every sound event, their feelings and thoughts in relation to particular sounds, or the soundwalk experience as a whole. Encourage participants to remember if they identified any special sounds of the place (soundmarks), any unwanted sounds and any sound signals. If an imbalance is identified in the soundscape, discuss what the group could do about it. If a special sound is identified, discuss how it could be preserved, shared or highlighted (see Schafer, 1994/1977).

Photos 2.2. & 2.3 From a soundwalk led by Katerina Tzedaki during the Summer Academy 2017 at the Old Fortress in Corfu, Greece

Comments: A prerequisite for a soundwalk is for the group to commit to no-talking, moving in the quietest way possible and silencing any mobile phones. The length of a soundwalk could be a decisive factor for its success depending on the age of the group. Young children are prone to making noise and talking about their experience while walking. For them, a soundwalk could be from 5 to 10 minutes of silence alternated by silence-free walking intervals. The adult leader may model the desired approach of a soundwalker, through their own manner of moving slowly and silently while focusing on different sounds, demonstrating their concentration and curiosity only through the quality of their gaze and their listening postures. The length of soundwalks could gradually be extended, as students become more accustomed to the condition of silent walking and start experiencing the state of inner calmness that could be induced by it.

Listening as a Tourist (Schafer, 1970)

Overfamiliarity with a place may contribute to a less attentive listening stance. In urban environments, listeners learn, through repeated experiences, to recognize almost automatically the most common sounds of the particular place. They often ignore these familiar sounds and walk around focusing primarily on potentially dangerous sounds, such as those related to traffic. Unless a novel or interesting sound attracts their attention, the focus might be turned inwards, listening to

12 You can find a good example of this approach in the children's book *The Listening Walk,* written by Paul Showers (1991/1961). In the story, a girl, during a soundwalk with her father, listens to two different lawn sprinklers and mimics their different sounds through speech as follows: "Some sprinklers make a steady whispering sound. Like this: thhhhhhhhhhhhhhhhhh. Other sprinklers turn around and around. They go like this: whithhh whithhh whithhh whithhh."

their own thoughts. Unlike a local person, "a good tourist inspects the whole environment critically and aesthetically. He never merely 'sight-sees'. He hears, smells, tastes and touches. The perceptive tourist might keep a world sound diary, remembering affectionately the entertainment of pleasant soundscapes visited." (Schafer 1970, p. 28).

Exercises:
1. Walk with tourist ears in the central square of your home place. Chose cards (size of A4 paper, which could be made from recycled cardboard boxes). The number of the cards will be 2/3 of the number of group participants. Draw a big ear on half of these cards using a colour from the flag of your country, and a big ear on the rest of them in a colour that does not appear on the flag. Attach each card on top of a reed cane or other stick of about a meter long. Go for a soundwalk to the central square of your hometown. One third of the group will hold the ear of a tourist from your country (colour of flag), another third will hold the ear of a tourist from a different country (other colour), and the rest of the group will hold no tourist ear, therefore listening as locals. Everyone tries to listen with their assigned imaginary ears and halfway through the soundwalk participants exchange their assigned ears.

Comments: Discussion follows about what they might have noticed a) with their own ears, b) with the ears of tourists from other places in their country, or c) with the ears of tourists from abroad. It would be helpful to prepare the group for this exercise by asking participants to share at will personal sound-stories from their past trips.

2. Walk with tourist ears in your school
The same exercise as above could be tried within the school soundscape, beginning from the school playground and walking through the outdoor and indoor spaces as a tourist.

Listening for diagnostic purposes (Sterne, 2003)

> *One of the most enduring symbols of modern medicine has been a listening technology: the stethoscope. The stethoscope marks an important point in the history of listening […] mediate auscultation refers to the practice of listening to movements inside the body with the aid of an instrument […] Mediate auscultation is the technique of using a stethoscope to diagnose.* (Sterne, 2003, p. 99)

Humans and other animals often use sounds of the environment as diagnostic tools; as a means to help them understand the causes of things, their own place in the environment, or as signals for events that might follow. Doctors have been applying for centuries their listening skills to help diagnose some health problems. They often use a stethoscope to help them hear better. Car mechanics also sometimes use a stethoscope to help them understand where in the car engine there might be the problem and what sort of problem that could be, based on the sounds heard.

Exercises:
1. Musical instrument tuner as sound helper. How do we know when the strings of our guitar, violin, or ukulele are tight, just enough so that they would sound well in tune? We might know, for example, that the highest string in the guitar is tuned in E, but how would we know how much to tighten the string so that it would produce the sound E? The sound will lead us. If we have not stored the exact sound of E in our long-term memory, we will use our sound-help, the tuner. We will keep playing, listening carefully and tightening or loosening the string, until the tuner indicates the note E in a different colour. Then, we shall know that the string has the right tension to produce

this note. In this exercise, find out what the tuning notes of a string instrument are and try to tune it using the sound as your guide and the tuner for assistance.

Comments: This exercise needs attentive listening in a quiet environment. If some members of the group have a string instrument and a tuner available at home, they could practice this alone in their own time. As a group, it might be possible for all to tune an instrument together, while projecting the tuner on a wall screen. For a more advanced exercise, a reference tone could be used from a piano or other instrument, and the group as a whole would have to suggest whether the leader should tighten or relax the string in order to reach the target note, based only on listening.

2. The stethoscope as sound helper. Interview a doctor and a car mechanic to find out what information they receive from the sounds through the stethoscope, which is useful for their profession.

Comments: This exercise might also lead to the discussion of *ultrasounds* as sound helpers in medicine. These sounds are too high for humans to be able to hear them, but their waves can penetrate the human body and can form images of our internal organs like the liver or the stomach. Doctors cannot hear them, but they can see the images they produce, and thus understand if there is a problem in the area of the body examined.

3. Share 'sound-as-information' scenarios. Here are two examples:

a) "It's evening and I am at home, getting ready to go out. The window shutters are all closed, but a window is barely cracked open. Suddenly I can hear heavy rain. I am thinking I must take an umbrella with me!"

b) My cats are meowing with a sound that they normally make when asking for food. Oh yes, it is already 5 p.m. Time to go out and feed them.

In pairs write down your own short scenarios about instances in which the sound gave you some useful information.

Comments: This exercise might become a starting point for discussing the uses a) of airguns in the ocean for underwater exploration (go to resource 1), and b) of SONAR (go to resource 2) for fishing, military purposes and seismic surveys. Watch also this video (go to resource 3) and then discuss the negative and often catastrophic effects of such uses of sound for marine life.

Listening through a microphone versus Listening only with ears (Westerkamp, 2001).

Westerkamp (2001) comments about the unique experience of listening through a microphone:

> Not only are the sounds highlighted, but the entire experience *feels* to the recordist as if he or she is more intensely *inside* the soundscape, because the sound is closer to the ear and usually amplified. […]. [When listening through a microphone] our ears are naked and open, much like those of the newborn […]. In that state of nakedness, the new-born's ear, the untrained ear in a foreign place, or the technological ear –the microphone– are all equally powerful awareness-raising tools. (p. 148)

However, at the same time, the microphone in a way separates listeners from the soundscape. As they lose the direct aural contact with it, they are also less able to sense how close and how distant

the sounds in the environment are and to determine their place in the soundscape (ibid). Considering the positive and negative effects of the practice of listening through a microphone, we suggest the following exercises.

Exercises:

1. Ears and microphones. Go for a soundwalk as a group. Try to have at least two good quality sound recorders, each one with two (split) pairs of headphones. Depending on the length of the soundwalk (at least 30-40 minutes), four group members at a time listen to the soundscape through headphones, and after some predetermined time (i.e. 5-10 minutes), they hand them to another group of four listeners. The rest of the group listens with no headphones. After the end of the soundwalk, every listener makes a list of sounds they remember from the soundwalk. If they can remember it, they mark with the letter 'H' the sounds they heard when wearing the headphones. Then the group discusses about the sounds, their physical characteristics, their meanings, the balances or imbalances of the soundscape, as well as the perceived differences in the experiences of listening with or without headphones.

Comments: This exercise is recommended for children of third grade and older, as younger children might possibly benefit more from direct aural experiences. The latter is closer to the experience of adults who listen through microphones, as young children's listening tends to be less biased by personal and cultural parameters, given their short life in the home culture. The exercise might also be a good starting point for the discussion of the possible dangers for hearing, due to the wrong use of headphones or earbuds. The group could watch this video (go to resource) about the dangers of loud listening to music through earbuds and the advice provided by experts regarding their appropriate use.

2. Ears and 'unplugged' sound collectors. In the spirit of the above exercise, young listeners can experiment going on a shorter soundwalk, or even perform a still listening exercise, during which they would alternate listening through their ears or through simple types of found or made sound collectors, such as paper cones or tubes and other such objects from their home. The listening session will also be followed by discussion about the difference of the two experiences of listening.

Comments: A possible extension of the exercise would be to investigate different kinds of sound collectors, including outer ears of different animal species and the way they function. Microphones could be discussed as a type of electrical sound collector. As with the above exercise, this also might be a good starting point for the discussion of the possible dangers for one's hearing due to wrong uses of headphones or earbuds (see previous exercise for the related video).

Inclusive listening versus Exclusive listening (Oliveros, 2005)

Our attention is a limited resource and therefore when we listen to a soundscape we cannot attend to many different sounds with the same degree of clarity. Inevitably, most sounds tend to remain in the background while we focus on a certain single sound or a sequence of sounds at a time. Composers like Pauline Oliveros (2005) support the importance of exercising the two different types of listening, namely the Inclusive Listening, which allows the listener to broaden their attention with the aim to perceive the soundscape as a whole, and the Exclusive Listening, which allows them to concentrate on a single sound and perceive every possible minute detail of its sonic identity. Moving between these two types of listening is an exercise that fosters the development of both perceptual sensitivity and flexibility.

Exercise
Ten for all, ten for one. For 10 seconds listeners are directed to use Inclusive Listening and direct their attention to the whole soundscape, while for the next 10 seconds they are asked to focus on one sound at a time. If the first sound dies out, they move their attention to another single sound until the count of 10, when they move back to the Inclusive Listening mode. The exercise continues for two-three minutes. Discussion follows about the identity and characteristics of the single sound sources and those of the whole soundscape.

Comments: The time frames of these two modes of listening could become considerably longer for older or more experienced participants, reaching i.e. 5-10 minutes in each mode.

Listening with the body (Gibson, 1966; Glennie, TED, 2007)

The ear is not the only organ for hearing our environment. Our hearing system includes in addition to the two ears, our head and the whole body, which, in coordination with the head, moves through the environment, actively exploring its sonic qualities (Gibson, 1966). Watch this video > of percussionist Evelyn Glennie (8:00 – 15:00), who despite her profound deafness is a world known performer. She explains how she learned to play music by listening with her body. An exercise she used to perform with her teacher was to try to distinguish between different sounds by placing her hands on the wall of the music room to feel the vibrations. Based on the above, here follow two exercises, the first using the hands or feet and the second the teeth for listening:

1. Listen with your hands or feet. You will need a drum or a large size plastic washing tub (turned upside down). You will also need two over-the-head earmuffs, the ones found in shops that sell garden equipment. Students form two pairs, back to back. The two students with the earmuffs, touching lightly the surface of the drum or tub, try to determine when the other two make sounds by hitting lightly or with more power two sticks together.

Comments: When the two pairs play and listen, the rest of the group should not make any interfering sounds. They could however practice body-listening, by closing their eyes and placing silently their hands on their desk, on the floor or on the wall, and trying to feel the sounds when played. The closed eyes are intended to increase concentration on listening.

2. Listen with your teeth. Dolphins and Toothed Whales listen with their jaws! (Krause, 2012). Participants can experiment listening with their teeth (jaws) by closing their ears with earplugs and using a toothbrush or a wooden stick. One end of the stick touches the vibrating body (resonator) of a sound producing object or instrument, while the other end is placed in the listener's mouth, who holds it between their teeth. Participants first listen through the stick and teeth (bones) and then take out the earplugs and listen to the same sounds without the stick. Following the two listenings, the group discusses the differences of their experiences.

Comments: The original idea for this exercise was the following 'radiohead' experiment, which you can find on the Exploratorium site (here >). Topics for further discussion could be a) how sounds travel differently through gas, liquid and solid material, b) why some animal species hear with their bodies, as well as c) what the effects of anthropogenic noise pollution on these animals are.

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Recommended Resources

http://soundexplorations.blogspot.com: *Soundscape Explorations.* This is a directory of Internet videos related to the field of acoustic ecology.
https://soundcloud.com/lamusiquedesoiseaux: *Le paysage sonore dans lequel je vis,* (GMVL, Lyon, France)
http://merlin.allaboutbirds.org: "Free, instant bird ID help for 6,000+ birds for North and South America, Europe, Asia, and Australia"
https://www.exploratorium.edu/explore/sound-listening: Videos, lessons and exercises about sound and listening. "Located in San Francisco, California, the Exploratorium is a public learning laboratory exploring the world through science, art, and human perception".
http://www.dosits.org: "The Discovery of Sound in the Sea website will introduce you to the science and uses of Sound in the Sea. [It] has been developed by the University of Rhode Island's (URI) Graduate School of Oceanography (GSO) in partnership with Marine Acoustics, Inc. (MAI) of Middletown, RI."
http://www.birds.cornell.edu: A website with rich audio-visual and educational material about many species of birds.Their mission is: " to interpret and conserve the earth's biological diversity through research, education, and citizen science focused on birds."
https://vimeo.com/40157629: R. Murray Schafer's keynote speech at the 2011 World Forum for Acoustic Ecology in Corfu, Greece.

Chapter Three

Towards a Pedagogy of Listening in Music Education

Zoe Dionyssiou

The surrounding environment and the culture we live in gives shape and meaning to our relationship with sounds and the soundscape. The aim of today's education must be the cultural change and autonomy of the person, his/her constant holistic development (Dewey, 1966). In other words, the aim of modern education is to create the conditions which will contribute to the transformation of a human being to a person, through the acquisition of knowledge, skills, beliefs and attitudes, thus through the assimilation of achievements of culture and cultural creation (Pavlidis, 2006).

In the first part of the chapter we are going to explore the importance of listening as a process in music teaching and learning. In the second part of the chapter we are going to propose a methodology for creative and critical listening of the soundscape. According to current research findings in the fields of music education and acoustic ecology, as proposed by Schafer (1993/1994), Truax (1999), and Etmektsoglou (2014), the proposed methodology can be based on the following four activity areas: a) sound as movement, b) sound as a medium for sound composition in class, c) sound as connection to the environment, d) sound as connection to culture. These areas aim to direct music educators towards a better understanding, perception, interaction and critical stance towards the sound environment, the ultimate goal of which is to cultivate environmental and cultural consciousness.

Listening as a central activity in music teaching and learning

In the last decades of the 20th century there has been a shift of interest of music education from 'music' to 'sounds'. Acknowledging the sound as the central element of music teaching and learning has its roots in the 'New Sounds in the Classroom' movement, and the pedagogy of Murray Schafer, John Paynter, and George Self (Schafer, 1965; Self, 1967; Paynter & Aston, 1970; Paynter, 2000), as well as in the era Cage established about music creation (Tinkle, 2015). In older times music meant the typically oganised sounds of unquestionable aesthetic quality which only great composers produced. After the 1970s the aforementioned composers-educators suggested and recognized the different aesthetics provided by placing the emphasis on the sound rather than on music. This entailed that students could learn music through sounds coming from themselves, from classroom objects, from tonal and atonal percussion instruments, and sounds from their body. It was possible for everyone to make music in class, as all sounds produced around us even with non-musical instruments are important. It was acknowledged that all people were capable of producing, understanding and notating sounds (in a conventional or graphic score) and had equal opportunities in music creation and expression (Tinkle, 2015; Kanellopoulos, 2012).

Gradually, technology and the rise of music discography brought people in contact with a vast amount of music cultures and styles. The World Music movement gave access to all kinds of

musical traditions, instruments, practices, dances and customs, to people outside the local community. Since the late 1980s great interest has been developed for the teaching of music of other cultures in the context of multicultural and/or intercultural education (Miralis 2006; Dionyssiou, 2017). Interculturality has worked as an antidote to the hegemony of western classical music. Researchers and educators have suggested creative and imaginative ways of introducing various music genres and traditions into education so as to provide links between community and education (Campbell, 2003, 2004; Lundquist & Szego, 1998).

Informal learning as researched and suggested by Lucy Green shifted the interest of music pedagogy to listening, aiming at the reproduction of music, not following the music score, but by ear. Some of the principles of informal learning are that students choose the music they want to learn and do this by ear, in haphazard ways, treating music pieces as a whole. Learning takes place among friends, usually without any guidance from teachers or other expert adults, and performance, composition, improvisation and music listening occur simultaneously in the music experience (Green, 2008).

Patricia Campbell (2004; 2005) has suggested practical ways of listening to music when teaching other cultures, always aiming at appreciating others' and our own culture through complete living musical experience. She proposes deep listening through three channels which guide listening experience with pupils and adults of different ages, and those are: a) attentive listening, b) engaged listening, and c) enactive listening (all presented in the next section of the chapter). A major contribution of cultural diversity provided by multicultural education has been peoples' mutual understanding and respect (Campbell et al., 2005).

All those changes led music education beyond the hegemony of western music that dominated the 20th century. Listening seems to be the key activity in contemporary music education. It can open ears and minds and it can help people acknowledge various music styles, welcome new practices, share emotions, and understand more of the world around them. Listening is not something objective and it does not always correspond to the acoustic stimulus, as the experience from listening to the same sounds may differ from person to person. However, listening includes a cognitive process, which refers to the way we understand, categorise and appreciate the sounds we hear (Kokkidou, 2015).

Listening is a process by which we consciously impose our hearing. 'To listen' means to decide to connect with the surrounding world of sounds and music, to assimilate what I want or what I think should be remembered. The psyche of every person affects hearing and listening, and vice versa, the way we hear also affects the psyche (Madaule, 1998). Listening does not only happen when someone hears an acoustic stimulus, but also while they think about it or imagine a sound. Listening also happens when someone performs music or improvises, as listening is a prerequisite for musical creation.

Methodology for listening to the acoustic environment

The model that follows tries to introduce students into hearing, listening, perceiving, understanding, appreciating, evaluating and participating creatively and critically in the soundscapes, which they live in. It consists of four steps or four types of activities. They can be applied in any order and in any combination for as long as the educator thinks is necessary. Some ideas and practical activities are presented for each of the four types for the music class of all ages. The Venn diagram below illustrates the four proposed categories whose focal point is the sound and allows for various combinations and connections with each other.

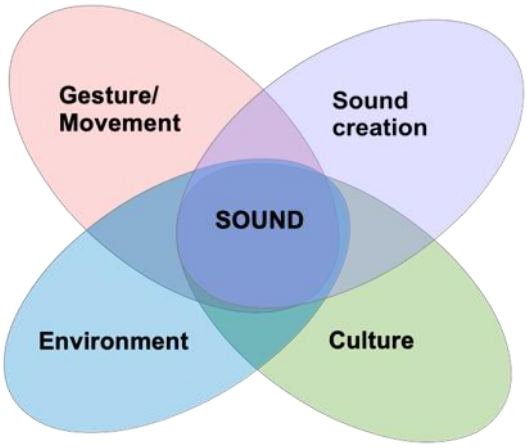

Figure 3.1 Venn diagram of the methodology for listening to the soundscape

a) Sound as movement

In general, in most schools in the western world the body is involved very little in the educational process, because the focus is on learning and is directed mainly to the brain. Merleau-Ponty (1962/2012) argued that perceiving and understanding the world presupposes and is directly dependent on the perception of the body and the self. Knowledge is not a mental representation of information, but a combination of the perception of the body and its psychomotor functions in relation to the world. There is no deep understanding and knowledge if there is no holistic experience of any subject (ibid). When singing and movement take place simultaneously can lead infants and toddlers to high levels of interpersonal synchrony, and this in turn leads to children's better socialization, prosocial development and well-being (Trehub & Cirelli, 2018). According to the theory of embodied cognition, movement is of great importance in human cognitive experiences. When a cognitive process is carried out, the body, through learning transfer, functions as a field for understanding knowledge. Thus, in the embodied experience the integration of the physical or biological body with the phenomenal and experiential body occurs (Bresler, 2004, p. 7).

In this vein, body's motor response to sound exploration offers an extended experience, embodied listening, which is useful and essential to people of all ages but necessary to children. Teaching music today without engaging our whole body in perceiving and understanding sounds is out of the question. Therefore, for a better understanding of the soundscape, it is necessary to create conditions for the children to experience the sounds with their whole body. It is important to start with the sounds produced through the use of the body, then with the sounds produced by our voice, and then with sounds produced by musical instruments or other sound producing objects. When experience is expanded through movement representation and sound exploration of the sound, this leads to a better perception and understanding of the sound.

This first category, the sound as movement, is also compatible with multimodality theory, according to which people use multiple channels of communication (eye contact, body movement, position in space, way and content of speech, codes of conduct, clothing, attitudes, etc.) (Kress & VanLeween, 1996, 2001). Both multimodality theory and phenomenological perception through the embodied experience, analysed by Merleau-Ponty (1962/2012), contribute to the need for the development of a multimodal, multi-sensory and embodied music education. Research in music pedagogy today relies heavily on the recognition that movement is a key element in the perception, understanding, and experience of music practice, which has its roots in the Dalcroze's

Eurhythmics, and introduces the students to the appreciation of music through movement (Dalcroze, 1921/2000). In music teaching and learning it has been argued that movement strengthens listening skills (Trehub & Cirelli, 2018).

The following activities are intended to provide an opportunity for creating a pedagogical context that is rich in sounds and movements in class, which will lead students to explore, create, concentrate, appreciate and respect each other. Before starting any musical activity, it is important for the teacher to create a safe context for the students to express themselves. It is proposed that discussion and evaluation follows after each activity or a series of activities, as this helps the students to concentrate, develop team spirit and have an aesthetic experience, which are always essential goals in music education.

Sample activities
Walk in many different ways and stop: Students are encouraged to walk into improvised phrases, or repeating the word 'walk' in different ways of speaking in volume, duration, tone and pitch to indicate the type of movement that suits the sound, changing the tempo, expression, stresses, etc. This way the team explores possible movements of the body in space and becomes familiar with the changes in movement as a response to speech. Through this activity students practice body coordination, body expression, socialization and bonding.
Beat the rhythm, keep the tempo steady: In a circle. The teacher gives a sound accompanied by movement and the students repeat it taking turns. It is important to keep the tempo steady when repeating each sound. Every time the teacher says "change", the direction of the circle changes, but the tempo must remain steady. Variation: We call "ta" clapping in crochets, "ta-a" in minims, "ti-ti" in quavers and "tiri-tiri" in semi-quavers. The teacher gives different rhythmic patterns following the circle, e.g. "ti-ti", "ta", "tiri-tiri", etc. Through this activity students practice concentration, body coordination, rhythm and cooperation among them.
Make a sound accompanied by movement: In a circle. Students present a sound accompanied by a movement. The challenge is to produce as many original sounds and movements as possible. After all students have presented their sound-movement pattern, they comment on what grasped their attention. The activity can be repeated at faster pace. Through the activity students practice creativity, originality, body coordination, cooperation among them.
Throw-grab the sound and the movement: In a circle. A student produces a sound that is accompanied by a movement and 'throws' it to another student, keeping eye contact and body movement. The student who 'catches the sound' has to respond with any sound and movement they think is appropriate. Then the second student proposes their own sound accompanied by a movement to another classmate. Through the activity students learn to be direct, communicative, cooperative and understanding to each other.
Continue my sound and movement: In a circle. The teacher or a student produces a sound accompanied by movement. The person next or a random person changes the sound-movement pattern in such a way that there is continuity in the sonic composition of the group. The activity trains students to attentive listening, empathy, body coordination and cooperation among them.
Move to my sound: Split the class into two groups. One group makes sounds (using their voice, body, and/or musical instruments) and the other group moves to the sounds of the first group. It is useful for the moving group to listen carefully and respond to all sounds. An improvisation may occur where each member of the second group responds to different sounds of the first group, or a sound composition. The movement team is asked to respond as faithfully as possible to the sound group. When the activity is completed, the roles of the two groups are reversed.

Give sound to my movement: This is the reverse of the above activity. Split the class into two groups: The first group moves as the second group makes sounds to accompany the movement. The challenge is to depict both the movement and the team spirit of the movement improvisation as faithfully as possible. When the activity is completed, the roles of the two teams are reversed.

b) Sound as a means of sound creation in the classroom

This category refers to students' creative work in the classroom, and to the creative and experiential role that each work is required to have in modern music education (improvisation, composition, recording, listening, performance, evaluation, etc.) (Kokkidou, 2015). Each of the above activities has a different role in music education from that in music performance, music production, or music composition. In class the teacher can explore some of the many possibilities offered by these actions for sound creation, with the basic aim of expanding students' horizons, listening with "open ears", getting acquainted with collecting sounds, recording, using music notation (conventional or graphic or improvised), playing with and changing the sounds, and creating sound compositions with their own rules and frameworks (Kanellopoulos, 1999, 2012). The aim of this unit is for children to define their own conventions through creative processes, which they engage with, experientially and holistically. Thus they are introduced to the concepts of theory and morphology of the sounds, laying the foundations for a broader approach to the sound phenomenon. These creative activities constitute fundamental practice in the music teaching and learning, through which students develop a multifaceted, creative, enactive and critical stance in music.

Sample activities
Make a soundwalk to a sound composition from graphic score: The class does a soundwalk around the school, following the relevant rules (the group follows a guide in silence etc.) and a student does the recording. When students return from the soundwalk, they draw the route on a chart or map of the area, marking the streets, squares, places they went past, and associate the track they followed with the recording. Once the listening is complete following the route on the map, the class is divided into 2-4 groups. Each group makes a graphic score following the sounds of the track so they can reproduce them. When all groups have finished, they compare their graphic scores and re-compose the soundscape according to their score. Variation: Compose a soundwalk. The students draw the route they will follow and try to predict the soundscapes they will encounter. It is an open composition with unpredictable elements. We improvise with sound based on images (paintings, photos, sculptures, videos) or stories: The class is divided into small groups. Each group gets an image or a story and inspired by these, they improvise. They use sounds produced by the body, voice, musical instruments, sonic sources.
We improvise with sound based on scenarios: Some scenario ideas are: a) Swallows are in their nests but feel threatened and get upset as people are heard cutting the grass using a lawnmower. b) We are fish swimming in the sea, when suddenly an upsetting noise can be heard approaching (a fishing boat, a whale, a yacht, etc.). The students continue the story as they wish. c) The Caretta-Caretta turtle comes out of the sea to create its nest. What sounds do you imagine she makes? How is she making her nest?
Creating a graphic score: We process sounds from various sound objects and try to portray the sounds in symbols by analysing their characteristics (pitch, volume, duration, texture) and what it can mean in arts (color, tension, layout in paper, movement, etc.). Then in small groups the participants paint the sounds of the other group to depict what they can hear.

Create a soundtrack composition in a graphic score: Participants listen to and record the sounds of a place at different times in the day (e.g. at a beach from very early in the morning until late at night.) Then they listen to the sound recordings and put them in time sequence.
Depicting a sound event on a graphic score: In groups. Each group depicts a sound event on a graphic score and presents it to other groups. The other groups try to find out what music event the score depicts. Students then reproduce the composition.
Group composition with sound and movement: Divide the class into groups of 5-7 people. A topic is given based on an image, a phrase or a sentence. The first group reproduces the topic in sound and movement, while the other groups contribute to the sound theme in any way they think they can. It is important for students to practice in taking decisions as a team, quickly and directly. At the end of the activities evaluation and criticism of the sounds and movements performed follow.
Creating a soundstory: A participant says a sentence and makes a distinctive sound that is related to something from the content of the sentence. Then the next person continues the story, also adding the sentence of the first person. The story goes on improvising until all participants have a go and complete an original story.

c) Sound as connection with the environment

The soundscape of each region often includes typical sounds related to the earth, vegetation, the inhabitants of the place (humans and animals) and many other elements. These sounds transmit or reflect information about its elements such as the earth, the water, its rocks, the weather (geophony) about the sounds of the inhabitants of the place, such as animals, birds, insects (biophony) and sounds created by humans (anthro[po]phony)[13] (Krause, 2012). This categorisation helps to perceive sound in relation to sound bodies and the wider environment. These dimensions of the sound refer to the multitude of relationships developed in acoustic ecology between the natural, cultural, and industrial environment (Paine et al., 2015).

In education, activities can familiarize students with listening and recording sounds in the urban and natural environment, and raise their awareness on acoustic ecology issues. Organising and taking part in actions on local soundscapes helps people increase their knowledge and raise their interest in the environment and the relationship of humans with it (with nature, animals, humans, noise pollution, environmental pollution, sustainability, etc.) (Schafer, 2011). Educating students on listening to the sound environment aims to develop environmental consciousness, explore the history and features of a place through its soundscape, etc. Such actions follow below:

Sample Activities
Find the image that fits to the soundscape you are listening to: Look at images from different landscapes and try to imagine and create the soundscape of each image. Variation: each group creates the sound of an image and the other groups try to guess which image corresponds to the soundscapes created. A discussion follows on the characteristics of the sound.
Find a solution to specific problems/scenarios through a musical improvisation: The class is in a circle. We set the scenario, the participants make a discussion and present possible solutions to the problem through a musical improvisation. Possible scenarios: a) How does a bird feel trying to

13 We chose to use the term ‘anthropophony’ which has been suggested by Etmektsoglou (see Chapter 1), because we think it is more accurate in Greek than the term ‘anthrophony’ suggested by Krause (2012).

create its nest on a busy road? b) A swallow is trying to reach the nest to feed her juveniles, but she cannot hear their tweets due to unpredictable noise. c) A sea turtle Caretta-Caretta goes out to the seashore at night to make her nest and lay her eggs. However, the fire lit by visitors who do not respect departure hours dazzles the turtle and the noise they make is confusing.
Problem solving scenarios through dialogue: Various scenarios of environmental and noise pollution are suggested (e.g., am annoyed by the neighbour's cockerel, technology and attention distraction, symbol and decoding of the symbol). The participants discuss developing their arguments.

d) Sound as a link to culture

Dealing with the soundscapes of a region involves the exploration of sound as a cultural product, as the sound is culturally defined (Panopoulos, 2005). In this direction Steven Feld did sound recordings and processed soundscapes aiming to understand the sound as culture. Among his recordings is the recording of the Kalouli tribe in Papua New Guinea (Music of the Kaluli) and Herakleia of Serres (Bright Balkan Morning). Feld called acoustemology the sound as a way of knowing and being in the world. "A way of hearing the world comes from interacting with it, but it also has to do with appreciating it, imagining it as one's very own" (Feld, 2001). Acoustic ecology actions can lead people to a better understanding of the soundscape and hence their culture. The development of cultural consciousness respecting our own and other cultures is one of the principles of intercultural education today (Campbell et al., 2005).

In education, it is useful for students to understand and appreciate the sound as a cultural process, as an expression of the relationships in a community. Activities related to the identification of local idioms and dialects, the performance of traditional songs using local idioms and dialects, understanding the customs, songs and games of an area, listening to music from other cultures, etc., lead students to an open and interactive music education where the perception of sound as culture has a key role. Some activities follow.

Sample activities
Local idioms: Students listen to different local idioms from recordings and try to find out which region each recording comes from, to produce and to understand words, phrases, phonemes, etc.
Sound and communication with distraction: Two people discuss a topic and the rest of the participants produce interfering noise (mobile phones, Viber, Skype, Messenger, distracting sounds). Discussion about issues of communication, respect, humour, harassment, etc. follows and how these determine our contact. We refer to body posture, visual communication, senses, place in space, environment.
Traditional songs and singing games - introduction to ethnographic research: Students carry out ethnographic research by contacting relatives and people from their home environment (older or same age) and record songs or singing games they remember from their childhood or those that are important to them, as well as different ways of playing. They then listen to the recordings and reproduce it using their voice and/or using musical instruments. They can also look up on the internet, research traditional instruments or local musical traditions and perform in class.

Traditional songs and music of other cultures: Students are introduced to activities based on the three ways of listening proposed by Patricia Campbell (2004): a) Attentive listening, b) Engaged listening, c) Enactive listening, when listening to music and songs from other cultures.
a) In **attentive listening**, the teacher guides the students to identify specific characteristics of the sound (texture, volume, pitch, duration) and/or the music (rhythm, melody, form, harmony). The teacher can carry out activities such as: follow the pitch of the tune making a gesture, follow the tune moving the hand as if it were painting in the air, or follow a specific instrument or voice, when listening to a track, tap the rhythm, draw the melodies as lines in a graphic score, distinguish the instruments, when they start playing, when they pause, keep the pitch of some instruments or the voice at a certain moment.
b) During **engaged listening**, the teacher carries out activities that help to keep students' interest active in various ways, such as using the voice, the body or instruments. The activities involve instructions such as: sing the tune by ear as you listen, play the beat on a percussion instrument (maracas), keep the strong beat on a percussion instrument (sticks, tambourine, drum), play a rhythm ostinato, play melodic trills where you think they fit in the melody, change the melody in a way that you think it fits, keep the beat of melodic phrases tapping your body, move according to the structural characteristics of the music (rhythm, melody, form, harmony), play percussion instruments in specific parts of the track (e.g. chorus), create choreographies in small groups, conduct the track as you listen, sing the basic melody a third higher or lower, play the basic harmonic accompaniment on a guitar or a piano by ear, dance in pairs without having planned the movement, clap at a certain beat of the track (for example on the 2nd and 4th beat of the track) etc.
c) During **enactive listening**, the teacher can perform listening activities to prepare the students for a new performance of a track. At this stage listening prepares the performance that follows. Students can accompany with voice or musical instruments during listening to prepare for the performance by ear that will follow.

Conclusion

These were some ideas for developing a methodology for listening to the soundscape and can be applied to children of all ages and school levels in education. It is suggested that these four categories are applied either in the order presented or in any other order and combination. In particular, the 'sound as movement' is expected to lead students to higher levels of sound appreciation, while the 'sound as a means of sound creation' leads them to a playful, creative and artistic attitude in relation to sound. It is useful to involve teachers of different specialties in each school through short or long projects. Also, the involvement of people from the local community in school projects is helpful in bringing the two together. The emphasis of the methodology was to inspire music teachers and other specialists and/or general educators to help their students develop a creative and critical relationship with the soundscape, which is a prerequisite for cultivating their relationship with the environment and culture.

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Chapter Four

‘BEAVER’: An Educational Framework for Approaching an Animal through Acoustic Ecology

Ioanna Etmektsoglou

Most of us, city people, may understand the voices of our pets, but to a large extent we have become ‘deaf’ to the sounding, living world beyond our home. Chances are that some of us cannot even distinguish the voice of a blackbird from that of a robin! Our *biophilia,* “our innate tendency to focus on life and lifelike processes” (Wilson, 1984, p. 1), has been considerably undermined. Along with it, it seems that the part of our self-identity, which Neisser (1993) calls the *ecological self,* is being increasingly shrunk. But what might be the implications of our psychological deafness for the natural world? As Schafer (2003) comments:

> *The failure of the twentieth century to protect the natural habitats of birds and animals is largely due to the fact that we do no longer hear nature or can put names to its voices. If you can’t name the birds, if you don’t know how to recognize the leaves of the trees by the sounds they make, or hear a cataract down the river, or recognize when a winter wind is bringing in a storm, nature is anaesthetized, and its survival will depend on forces other than human. (p. 38)*

Borrowing the name of an animal as an acronym, the proposed model *BEAVER* attempts to stimulate interest for a particular animal. It provides a framework for exploration and research of this animal’s sound-related characteristics and behaviours, as compared to those of humans, and of its function in its home environment and the soundscape. It aims to foster respect and empathy for this animal and lead to increased perceptual specificity (see Gibson & Pick, 2000) in the examination of its unique voice; a voice which could become a resource and an archetype for sonic imitations in soundscape improvisations or compositions. The *BEAVER* encourages teachers and students to focus their research on six main subject areas in relation to the particular animal:

Being – Not a Thing!
Excellence
Adaptation
Voice-Unique Characteristics
Environmental Balance (Ecosystem and Soundscape)
Relation to Humans

Table 4.1. *The ‘BEAVER’ Model*

You can find examples of worksheets from applications of the ‘BEAVER’ to the study of: the Cat here (go to resource), the Common Swift (Apus apus), the Hummingbirds and the Eurasian Otter (Lutra-lutra). Videos from two groups of university students from the Department of Music of

Ionian University, who perform songs which they composed as part of their study of the Kolibri (Hummingbird) [video] [music score] and the Eurasian Otter [video] [E.O. music score], as approached through the model 'BEAVER', are also attached.

An introduction to the six main subject areas of the *BEAVER* framework follows:

Being – Not a Thing!

The first step of this exploration is to find evidence which exemplifies that the animal is a person and not a thing. Krause (2012) shares a heart-breaking story of a male Beaver who returned to his nest after hunting, to find out, to his great surprise, that a hunter had killed his partner and offspring while he was away. Listening to a recording of this Beaver's vocalizations following his great loss, one could clearly identify them as a *lament!*[14] There is no doubt to the listener that this Beaver was experiencing strong 'emotions', which were expressed through his 'crying' voice. Francione (2009) states that humans ought to approach animals as 'persons', because unlike inanimate things, they are sentient. They are capable of subjective awareness and have an interest in continuing to live. Real or created stories, research evidence, but perhaps most importantly personal memories which highlight an animal's emotional life, are believed to encourage children to conceive the animal's personhood. This evidence might focus on the manifestation of affective responses in a) interactions i.e. between a mother cat and her kittens, among members of a group of cats, during play, in socializing with other cats (conspecifics) or with dogs (individuals of other species), and b) in reactions to painful events, to adverse environmental conditions, boredom etc. While attending to such issues, students would especially examine the particular uses of sound by the animal in the communication or expression of emotional states.

Excellence

An anthropocentric approach to animals tends to place humans on the top of a pyramid of excellence and the rest of animals at lower levels. Searching for excellence in different animal species could be a way of 'disturbing' the fixed idea of man's superiority in the natural world. The excellence could be discovered at various facets of an animal's being in terms of their perceptual, cognitive, social, emotional, physical and other possible characteristics, which have been shaped at phylogenetic and ontogenetic levels as part of their development and survival in the particular habitat. Given the sound emphasis of the *BEAVER* approach, the search for excellence focuses primarily on any characteristics that might be related directly or indirectly to sound, such as:

- *physical characteristics of the animal's hearing instrument*
- *auditory perceptual abilities*
- *sound producing mechanisms*
- *characteristics of songs or calls*
- *meanings and uses of sounds,* as well as
- *ways it might have developed for modifying its sounds (i.e. augmenting their volume by using resonators from its environment).*

Excellence might be related to analogous characteristics or abilities of other animal species, including humans. The aim is not to just identify *animal experts* but rather to discover, through research and experience, that excellence is distributed among different animal species and not possessed 'solely' by humans.

14 You can also watch this part of Krause's presentation in this video >.

Adaptation

As animals we constantly adapt to the environment in order to survive and thrive. Our perceptual systems are finely tuned to the characteristics of our ecological niche (Farina, 2013), the 'home' area for our own particular species. Discovering and understanding how individuals from different species use their especially adapted sensory systems and their actions in ways that maximize their survival in their ecosystem, might have a great educational value. It can contribute to the awareness of a high correspondence a) between sensory systems and the environment, b) between sensory production and sensory reception mechanisms, c) between signal characteristics and the particular habitat, and d) between an ecosystem's balance – 'health' status and its species' welfare.

Adaptation is a very useful mechanism, but not limitless. Affordance, a concept introduced by James Gibson (1979), might be a tool for understanding the possibilities and the 'limits' of adaptation of a given animal, as well as the role of the environment as a correspondingly adaptive agent, which facilitates the needs of the animal. According to Gibson & Pick (2000): "An 'affordance' refers to the fit between an animal's capabilities and the environmental supports and opportunities (both good and bad) that make possible a given activity." (p. 15). As affordances depend on differences in species, age, and habitat characteristics, an educational objective could be to provide opportunities for the exploration of a) possible sound-related adaptations of a particular animal (young, mature, or older), b) the corresponding adaptations of its environment and c) their good or bad fit, which might allow or deny the realization of this animal's vital affordances and its potential survival.

Echolocation[15] is a good example of adaptation, which has been developed by animals such as dolphins, toothed whales, and bats, so that they can move around and survive in dark habitats using this specialized way of 'seeing' the environment through the echoes of their own sounds, as they hit on obstacles (prey, conspecifics, rocks, trees etc.) and return back to them[16]. However, this biological SONAR may become ineffective if there is too much noise in the environment which masks its sound. In learning about echolocation, students may find out about the detrimental and sometimes lethal effects of anthropogenic sounds in dark habitats like the ocean, where noise often causes whales to become stranded and often die, because they cannot rely on echolocation in a noisy environment.

Voice-Unique Characteristics

At a phylogenetic level, every animal species has developed its own characteristic 'voice' as a result of its unique physiology, its survival needs and the ongoing adaptations to its habitat (Krause, 2012; Wilson, 2000/1975). This acoustic signature, including a unique timbre, as well as other special musical and communicative characteristics, ensures that the animal could be recognized aurally by conspecifics and even individuals from some other species. The word 'voice' is applied here in a broad sense to include all possible sound-based types of communication, such as sounds that might be produced through specialized mechanisms located inside the animal's body (i.e. larynx, syrinx), or through particular body movements (i.e. rapid wing sounds, stridulation, hitting an outside object with an animal's body part etc.) (Cornell Lab of Ornithology, 2011). Based on the intended messages communicated, animal sounds might be categorized as: territorial calls, mating calls – songs, alarm calls, contact calls etc. (Cornell Lab of Ornithology, 2011; Attenborough, 1998).

An animal might call in search of a mate. Often the quality of the call determines whether or not the male will be chosen by a female animal and for this reason, *mating songs* tend to be the

15 You can watch this video > by SciToons (Brown University) in which bat echolocation is explained.

16 The mechanism and function of echolocation is explained in the Greek song "Nyhterida" (Bat) (Etmektsoglou, 2016) *which you can listen here* > . It was composed as part of the children's story *Kratisou Pano mou* (by Don Echotes).

most complex type of calls. A call or song could also be an aural sign of *territorial* borders, as an animal could use it to establish and communicate its territory to individuals from the same or other species. Some animals use certain *alarm calls* to let members of their group know that an enemy is approaching, and different ones to announce to the enemy that they should retreat. Some animal species have developed a variety of *alarm calls* that specify to the listener for example whether the enemy is approaching from the ground or from the air (Attenborough, 1998). Another general type of calls are the *contact calls*, which are uttered among members of a family or larger groups, when they want to stay in touch, and be aware of the location of the other (i.e. mother – offspring), especially when environmental conditions make it difficult to see (i.e. night time, nesting in dark places, being in deep oceanic waters or in thick forests) (Wilson, 2000/1975). Students are encouraged to become familiar with the sound repertory of the animal examined, in terms of the meanings and the physical and musical characteristics of its calls so that they could eventually become able to recognize and mimic them.

Environmental Balance (Ecosystem and Soundscape)

Biological diversity or biodiversity refers to the variety of living nature in ecosystems. According to Darwin's theory, this biological variety increases the possibilities for life to continue on earth, as some of the different living species, adapt successfully to the changing environment and manage to survive (Milton, 2002). Becoming aware of the various animals and plants living around the students' home and their home town might offer a good foundation for understanding biodiversity, its significance, and the necessity for its protection, as an act of "safeguarding nature's long-term independence." (ibid, p. 116). Closely tied to biodiversity is the issue of balance. A logical question to ask would be, to what extent a habitat with an X number or different animal and plant species appears to be balanced or seems rather imbalanced, with some animals or plants overpowering others in various ways such as through number, space, aggressive behaviours, sound etc.

From the point of view of an acoustic ecologist, biodiversity in an ecosystem could be additionally approached as a cause for a rich sounding soundscape; a soundscape that is characterized by sound diversity. Every different individual of every species could be perceived as a different musical instrument in the animal – plant orchestra. Despite our emphasis here on animal sounds, let us not forget the plants as important members of nature's orchestra (López, 2001). Given a full 'orchestra', to what extent does it sound well balanced? If it doesn't, what sound sources are responsible for the imbalance? How does the animal we study contribute to the balance or imbalance, or to what extent is it affected by it?

Relation to Humans

Perceiving something that is 'like' our own self in non-human animals might lead to psychological identification. Milton (2002) uses an example by Naess to illustrate the decisive role of this identification in the development of empathy towards non-human animals. In the example, Naess describes the emergence of empathic feelings in him while watching a flea *who* had fallen accidentally in some acid chemicals and was slowly dying. He explains that the reason he was so affected by watching the flea's death struggle was that he had identified with this small animal; that is, he saw a part of himself in the flea. Educating for the perception of more or less obvious similarities between human and non-human animals could facilitate the depth and breadth of possible identifications with the natural world. As part of the education of perception, not only similarities but also differences might be discovered. If these differences are examined in the context of the individual animal's life and in relation to the ecosystem, they might contribute to a deeper understanding and appreciation of the particular animal. Among these differences, students might discover certain abilities or characteristics that exceed similar properties in humans; thus they could gradually appreciate the uniqueness and intelligence of non-human animals and develop greater admiration for them. Students could ask questions such as: can animals perceive emotions

by listening to other's vocalizations, as humans do? The answer to this question is yes, at least for the dog (Andics, Gácsi, Faragó, Kis, & Miklósi, 2014), but perhaps for many other animals, too.

Conclusion

Becoming acquainted with an animal species through the *BEAVER* framework (see attached Worksheet*)*, provides opportunities for embodied, perceptual, aesthetic, scientific, emotional, moral, relational and cultural learning, regarding the particular animal and its home ecosystem. As students explore this animal's life and special characteristics, while placing an emphasis on sound-related processes, abilities and phenomena, they also learn about themselves. In addition to their ecological implications, the knowledge and skills acquired through *BEAVER*, concerning particular sonic parameters and energy contours or gestures, could find their way into students' *Group Elemental Soundscape Improvisations* (Etmektsoglou, 2018), an approach, which will be presented in the following chapter.

ACKNOWLEDGEMENTS

The *BEAVER* educational model was developed as part of my research for the Project: *"Le Paysage Sonores Dans Lequel Nous Vivons"* (2016-1-FR01-K204-024001 Erasmus+ Program K2 "Strategic Partnership"). A prior expanded version of this chapter entitled: "Cats don't just miaou! Exploring animal sounds in soundscape improvisation: A tool for developing environmental awareness, empathy and aesthetic sensitivity", was published in S. Breitsameter and C. Karakiz (Eds.). (2018). Proceedings of *The Global Composition 2018: Conference on sound, ecology, and media culture.* Media Campus, Dieburg. Darmstadt University of Applied Sciences. pp. 56-69.

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Recommended Resources

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Cornell Lab of Ornithology. (2014). *Bird Song Hero Video Quiz: Be a Bird Song Hero.* https://academy.allaboutbirds.org/bird-song-hero-video-quiz/: Bird song recordings and spectrograms. Good exercise combining audio with visual stimuli.

Krause, B. (Published October 8, 2009). *Do Animals Grieve for the dead?* [Video file] FORA.tv. Retrieved from this location>. "Dr Bernie Krause, creator of Wild Sanctuary, argues that animals may posses a degree of emotional depth by playing a sorrowful call from a male beaver after its entire family was killed by humans."

Krause, B. (July 2013). *Bernie Krause: The voice of the natural world.* [Video file]. Retrieved from this location>. "Bernie Krause has been recording wild soundscapes –the wind in the trees, the chirping of birds, the subtle sounds of insect larvae– for 45 years. In that time, he has seen many environments radically altered by humans, sometimes even by practices thought to be environmentally safe. A surprising look at what we can learn through nature's symphonies, from the grunting of a sea anemone to the sad calls of a beaver in mourning."

Chapter Five

Soundscape Awareness Through Creative Group Explorations

Ioanna Etmektsoglou

A Creative Learning Cycle: Soundscape Analysis, Improvisation and Performance

Ecosystems, at least when they are healthy, are usually places inhabited by many different species of fauna and flora, which create a polyphony of sounds. Soundscape is the 'voice' of the ecosystem. It may provide important information about forms, patterns, phenomena and laws of nature; about relationships, emotions, communication, social practices and dynamics; about motives, balances and imbalances among persons of the same or different species. All we have to do in order to access this information is to listen carefully, like skilful musicians and researchers. Soundscape research through specialised recording approaches was found to be an effective tool for the assessment of animal diversity in nature ecosystems (Depraetere, Pavoine, Jiguet, Gasc, Duvail, & Sueur, 2012), providing thus important information about their health and sustainability. Attentive listening seems to be the key to understanding 'wild' and rural soundscapes, but also could foster our understanding of urban soundscapes (Atkinson, 2011). Beyond its contribution to understanding, attentive listening may become the motivational force for students to willingly modify their behaviours at home and in shared spaces, based on their newly acquired aesthetic and ethical criteria. Therefore, soundscapes could be a valuable educational tool in the context of acoustic ecology, environmental education and music. In addition to exercising different ways of listening to soundscapes, as described in Chapter 2, students could be engaged in creative, immersive collaborative activities as a means of increasing their awareness of others in the ecosystems and developing their aural perceptual and aesthetic skills. The three 'musical' types of activities proposed in this chapter are:

- Soundscape Analysis – Evaluation – Action
- Soundscape Improvisation
- Soundscape Performance

In the section that follows, each one of these three types of activities, a) Soundscape Analysis – Evaluation - Action, b) Soundscape Improvisation, and c) Soundscape Performance, will be presented and explained. The teacher-facilitator would have to adjust the material proposed here, depending on the age and other characteristics of their group. However, it is believed that with appropriate adjustments, these types of activities could be accessed by various groups. After the discussion of Soundscape Performance, will follow the discussion of a specialized approach of Soundscape Improvisation, referred to as: *Group Elemental Soundscape Improvisation.*

Before moving to the discussion of the three identified types of music engagement, it should be noted that they are interconnected by the processes of attentive listening and evaluation. Evaluation appears as a part of the first mode, that of Analysis, but in fact, along with "its tool",

attentive listening, they continue to function through the other two types of engagement. Evaluating the original soundscape and then the group artistic product as it develops might provide critical information; this could encourage the emergence of cycles of Analysis, Improvisation and Performance as they appear in order, or in different configurations. For example, the evaluation of a soundscape performance might define the end of the creative-scientific process; yet it might also lead to the re-analysis of the original soundscape or to another improvisation, which this time might or might not lead to performance.

Having discussed the cyclical nature of the three musical modes of soundscape exploration, I will now focus on the mode of Soundscape Analysis.

Soundscape Analysis – Evaluation – Action

Soundscape Analysis begins with listening to the soundscape with the aim of identifying the sources of sound events and the actions or circumstances that create the particular single sounds or sound sequences which are perceived as sound events. The aim is for the participants to identify as many sound sources as possible, directing their listening to the high and low, to the soft and loud, to the distant and the close by. Additionally, they would be encouraged to be as precise as they can regarding the identity of each source. For example, instead of marking a sound as originating from a vehicle, they would try to distinguish whether this vehicle was a car, a truck, a bus, a motorcycle etc. Finally, as sounds may provide information about actions, it would add specificity to the analysis of soundscape if students would identify these actions. For example, in the case of a cat being identified as the sound source, they would be asked to specify whether the cat was meowing, purring or hissing, or in the case of an airplane sound, whether the airplane was landing or taking off. It is possible that in some instances the group participants will not be able to infer the name of the sound source and the implied action by listening only. In that case, they might need to research the subject by asking knowledgeable people or searching the related bibliography, recordings or videos.

To help them become more aware about relationships and balances in the soundscape, group members are asked to place the already identified sound sources in one of the three categories suggested by Krause (2012), *biophony, anthro[po]phony*[17]*, and geophony.* An adjustment to this categorization is proposed by the writer. Based on this, anthropophony includes three sub-catergories, the primary, secondary and tertiary anthropophony. The primary anthropophony refers to all sounds that humans produce with their body or with very simple tools such as sticks or canes. The secondary anthropophony refers to sounds produced by humans manually but through more advanced tools and acoustic musical instruments, while the tertiary anthropophony refers to the humanly induced sounds which are produced by electricity or other non-manual sources of energy. Krause's (ibid) category of biophony is subdivided into two sub-categories, the anthropo-biophony (or primary anthropophony)— a sub-category shared with anthropophony—and the non-human biophony. The category geophony remains as proposed by Krause (ibid). What might follow is the identification of certain sound events based on their culturally constructed meanings into soundmarks and sound signals[18], (see Schafer, 1994/1977), and the sharing of personal meanings that group participants might have associated with particular sounds of the soundscape. In this section, the group might not have first-hand access to culturally constructed meanings and

17 See footnote 8, page 6

18 There are also non-humanly produced sound signals in soundscapes such as various birdsongs. The understanding of their possible meanings could foster environmental awareness in human listeners. Here > is a worksheet (Decipher the call: from sound to design to sound) with questions that might facilitate the analysis of a birdsong based on its meaning (as a sound signal) and based on its physical characteristics (as music).

might need to research the particular subject bibliographically or through interviews of soundscape 'insiders'.

Having identified the sound sources and discussed their meanings, students could continue the soundscape analysis by listening now to it as a music composition (see Schafer, 1994/1977), first focusing on the physical characteristics of every sound event, then on the musical characteristics of the soundscape and finally evaluating it as an aesthetic product (see Schafer, 1994/1977). Regarding the analysis of the physical characteristics of the sound events in the soundscape, the group's attention may be turned towards spatialisation, with students trying to decide where to place every sound source in the environment. The distribution of different sounds in the sound spectrum (the part of the spectrum that every sound occupies, along with its harmonics) may also be addressed. Here, a possible question would be for example: are too many sounds centred around the lower part of the audible range, while leaving the middle and higher parts quite free of acoustic energy? This part of analysis based on the physical characteristics of sounds will be completed with the examination of sounds' distribution in time, meaning whether all sound events enter the soundscape concurrently or not, if some of them take on a soloist role at certain times etc. Then follows the examination of sound intensity distribution, meaning assessing each sound's intensity level, or in musical terms, the development of its dynamic range (quiet-loud).

Delving deeper into soundscape analysis[19], students might identify one or two short sound events and proceed to their micro analysis focusing on each sound's duration, its overall loudness, its timbre (frequency spectrum and kind of attack), its pitch (if they can perceive a tone) and its degree of noise, but also focussing on its developing energy envelope, or its birth, unfolding life and death, using Schafer's (1994/1997, 1986) terminology. Finally they may notice changes in its general timbre or even micro changes in loudness and timbre, which might give it a pulsating or rough quality as opposed to a steady and clearer one.

The musical evaluation of the soundscape would include: the examination of sound diversity, or 'orchestration' of the soundscape, focusing on how different the sound events of the 'composition' are; the identification of similarities and differences among sound events and among soundscape sections if such sections are perceivable as the soundscape develops in time; the identification of emerging musical patterns (i.e. rhythmic, melodic, textual), and the examination of perceived aural transparency in the soundscape which allows a large variety of sounds to be heard clearly, including the most soft ones, or in the contrary, the lack of transparency and the high degree of masking. Soundscapes as 'music' may also be evaluated by the degree of density in terms of the multitude of sound events heard at the same time, but also in terms of the number of different sound events appearing in close succession one after another, with or without intervals with diminished sound activity. Finally, the listeners may evaluate the evolution of the soundscape regarding changes in density, transparency and in developing patterns if they exist, as it unfolds in time. The examination of soundscape's evolution might or might not reveal the existence of a musical form, such as a two or three part composition etc.

The approach of the soundscape as a musical composition in this phase could include an aesthetic evaluation. According to Schafer (1994/1977), this kind of evaluation is subjective and to a large extent depends on individual and cultural parameters. Nevertheless, it would be of high educational value for the group of listeners to find similarities and differences between themselves and other members of the group, regarding what particular sound events they like or dislike and

19 In 'Masticha' project, created by Marios Skamnelos, MA student and music educator, young children are encouraged to perform a micro analysis of the sounds of musical instruments focusing primarily on the characteristics of every (MIDI) instrument's sound timbre and trying to find everyday objects that might produce such timbres (see here > the project description and here > the video).

what kinds of soundscapes they value highly. In addition to the beauty or ugliness attributed to the soundscape, the degree of its uniqueness could be an important criterion for its evaluation.

Now, the group could move from listening and evaluating the soundscape as music to listening and evaluating the ecosystem that creates it. Students can focus again on issues of sound diversity, balance between the sound events, masking and sound pollution, but this time asking themselves about what these sound qualities might mean for the wellbeing of the ecosystem. A large sound diversity could be connected for example with a large biodiversity. A soundscape with serious imbalances between its sound events could be described as a LoFi soundscape (see Schafer 1994/1977; Truax, 1999/1978) and would be possibly characterized by sound pollution, which could affect to a smaller or greater degree its living inhabitants of various species[20].
In the latter type of soundscape, students would examine the phenomenon of masking, and could attempt also to evaluate the degree of shrinking of the acoustic horizon, which limits the ability to listen only within the boundaries of a very small imaginary sphere around the listener.

Photo 5.1. Posters about sound pollution in the ocean and its effects on Cetaceans hung up on strings. Facilitator: Elina Kalampokini. The event took place during the Summer Festival 2018 of the Alternative Corfu Laboratory as part of the Erasmus+ program: "The soundscape we live in", Corfu, Greece.

The ecological evaluation might reveal problems of sound pollution and the need for actions towards improvements in the soundscape[21]. Following Acoustic Ecology's orientation towards active engagement for the improvement of soundscapes (Schafer, 1994/1977), at this point, students may focus on strategies for such improvements, which might include campaigns for community awareness, educational activities, communication with private companies and public services etc. An example of an educational activity could be to introduce to the public a sound pollution problem during a local festival through posters, talks, videos, soundwalks and sound games. Here is an example of communicating to the public the serious threats faced by Cetaceans due to sound pollution in the ocean, through a program entitled *Games In the Depths of Sound* that took place during a local festival in Corfu Greece. Sometimes the analysis and evaluation of certain soundscapes might reveal problems that would require the communication with technicians (i.e. sound engineers) or customer service departments, which produce and sell noisy machines, such as a specific motorcycle, an air conditioning unit etc.[22]. Such actions may have a dual effect: the first would be towards the improvement of the soundscape and the second towards the education

20 We often do not realize phenomena of masking as we are not aware of how the soundscape would sound without the over-dominating sound events. Finding or creating the conditions in which the masking sounds are not present even for short intervals, may reveal to perception the softer, masked sounds, increasing thus awareness of the sound pollution problem. A short silent listening exercise in a class of secondary school students, during school activities at a relatively quiet time, is described by Aggeliki Savvani, music educator (Appendix III).

21 A Sound Pollution Worksheet with guided steps on how to approach a specific problem can be found in Appendix I.

22 In Appendix I you can find an example of email communication between a customer and an electric appliances company, regarding a 'noisy' refrigerator >.

and increased awareness of technicians, customer service staff and other company employees who are involved in the communication regarding the noisy product. Even though a great number of soundscapes in our towns and villages tend to have sound pollution problems, sometimes students might be fortunate to find themselves in the position of having discovered a very interesting soundscape! If that happens, the group could plan strategies for its preservation. An outline of the actions suggested for the Soundscape Analysis – Evaluation – Action phase, follows in Table 5.1:

Soundscape Analysis – Evaluation – Action		
Identification of sound-sources & their sound generating actions		Names of sound sources and their actions i.e. airplane landing, dog barking, cat hissing. Possible need for research about sound-sources (i.e. physics, physiology).
Classification of sound-sources		Anthropophony (primary, secondary, tertiary), Biophony (primary anthropophony, non-anthropo-biophony), Geophony. (see Krause, 2012, adjusted by Etmektsoglou).
Meanings of sounds		Soundmarks, Sound signals, cultural meanings, personal meanings (see Schafer, 1994/1977; Truax, 1999/1978). Possible need for research about meanings of sound in the particular culture or species (i.e. bioacoustics, acoustemology, soundscape studies etc.)
Sound as composition	Physical Characteristics of Sounds	Distribution: Spatial, Spectral, Temporal, Intensity (dB). Micro Analysis (sound event): Duration, loudness, timbre (frequency spectrum), pitch (if any), degree of periodicity, degree of noise, changes in loudness (attack, body, decay), changes in timbre, micro-changes in loudness and timbre.
	Musical Characteristics of Sounds	Sound diversity (orchestration). Similarities - differences. Emerging Patterns. Transparency. Density. Evolution (changes of density, transparency, patterns if any). Form.
	Aesthetic Evaluation of Soundscape	Identification of Pleasant and Unpleasant Sounds (individual evaluation). Overall evaluation of soundscape for beauty & uniqueness (individuals & group).
Ecological Evaluation		Sound diversity, Masking, Sound Pollution. Balances (HiFi – LoFi). Acoustic Horizon.
Proposed Actions		Actions for Improvement or Preservation (organization of public events, letters to companies, to local and national agencies, soundwalks, etc.).

Table 5.1. *Soundscape Analysis – Evaluation – Action Guideline*

Soundscape Improvisation

Having completed the Analysis – Evaluation – Action phase of the creative learning cycle focusing on a particular soundscape, students hopefully would have formed an adequate understanding, which they can base their improvisation on, as an attempt to recreate this soundscape imaginatively. The word *improvisation* is employed here with its broad meaning which could also encompass a less 'prepared' composition. The reason for blurring here the boundaries between improvisation and composition is that the fluidity and variability of soundscapes coupled with the group process and the lack of an exact system for notating soundscapes usually make their creative reproductions neither pure improvisations nor pure compositions in a traditional sense, but rather a hybrid creation. In the following section we will examine an approach to planning and implementing soundscape improvisations, which is outlined in Table 5.2:

Soundscape Improvisation	
General Approach	Mimetic vs. Mimetic-Imaginary Soundscape Autonomous, or in combination with photos, movie, movement etc.
Material Used	Choice of pre-recorded excerpts Choice or creation of additional sound-sources Sound-variety vs. homogeneity of sounds
Temporal considerations	Length, parts, development of form
Spatial considerations	Space characteristics Listener's Perspective: moving or stationary Spatialisation of specific sounds for performance (i.e. moving bird)
Emotional tone	Specific & Stable emotions vs. Change of emotions
Message	Explicit or Implied
Listening as a compositional tool	Variety Balance in form, sound timbres, dynamics Transparency versus Masking Economy: No longer than necessary

Table 5.2. *Soundscape Improvisation Guideline*

Beginning with a general approach to the Improvisation, the group might consider how close to the original soundscape their artistic product will be. Will they represent it very closely or would it intermingle its mimetic renditions with imaginary elements to highlight some of its important characteristics or intended meanings? Another decision at this stage is whether the improvisation would be an autonomous process/product or it would be coupled with specific photos, a movie, a dramatization of a story, a dance-movement performance etc. Regarding the material used for the improvisation, in addition to using the body and the immediate environment as sound sources, the group might decide to choose or create additional sound sources or make use of pre-recorded excerpts from the real soundscape (unedited or slightly edited). Having collected the sound material, they could decide if those would provide the desired sound-variety or a more homogeneous musical texture. Temporal considerations may follow so that the group can decide

how long the improvisation would be, whether it will have sections and what those might be, and what its basic musical form would be[23].

Spatial considerations would be another theme of the preparatory discussions. What sort of space would the improvisation attempt to represent? i.e. the inside of a busy urban coffee shop or a playground at a local park? What would the listeners' perspective be? i.e. would they be sitting at a place or walking? Would the audience be sitting at the centre of the room and the musicians all around? etc. In the attempt to make the soundscape more realistic, the group might decide to place certain sound sources at specific locations or make them move. A group decision about the emotional tone of the soundscape might be helpful in order for the musicians to communicate collectively the intended message more efficiently. What would be the main emotion and would it remain the same during the improvisation or would it change to one or more different ones? What about the message of the improvisation? Would it be presented explicitly or would it be more subtle and thus would be implied? As the group experiments with the implementation of the above decisions regarding the character of their soundscape improvisation, attentive and critical listening accompanies its creative explorations, focusing on variety, on balance in form, on sound events and sound intensities, on transparency or its absence. Finally, critical listening is exercised when deciding about the length of the improvisation so that it is not longer than necessary, based on aesthetic and communicative criteria.

Soundscape Performance

Several issues arise when considering the preparation of a soundscape improvisation performance, which might have essential educational implications. Major issues to address are the characteristics of the performance space and those of the available sound distribution and amplification equipment, if the latter is being used. Space characteristics that would be useful to consider are the degree of reverberation and echo, the inside and outside noises, including the noise from heating or air-conditioning systems, lights, etc. Familiarization with the equipment, whether it is musical instruments or amplifiers, speakers etc., could be approached as an integral part of the preparation and exploration, well before the performance. The time dedicated to the exploration of available space and equipment, would allow for efficient and creative choices regarding sound spatialisation, meaning the placement of speakers or unplugged sound-sources in particular points in space and the arrangement of seating positions in relation to the sound sources.

Last but not least, the ethical considerations regarding soundscape performance follow. I believe that the following question is of utmost importance for all sound makers:

How, where and how loud will the music be performed as to ensure that all active or passive listeners will not be put in any health danger?

As social beings, students would have to learn to exercise their creative freedom to the extent that their actions do not impinge on others' health. Subjective evaluations, research about hearing sensitivity of various species as well as decibel measurements could provide valuable feedback to the group concerning how loud is "too loud" for humans and other species.

23 Here > you can listen to the composition by two high school students, who used self-recorded sounds and organized their music into sections by making use of two different spaces —the inside and outside of a house—articulating the change of space by the sound of a door. The composition was supervised by the postgraduate student and music educator Kassiani Ritou, as part of an assignment for a graduate course module on Acoustic Ecology > (Deprt. of Music, Ionian Univ. 2017).

Soundscape Performance	
Space-Equipment Considerations	Space characteristics (reverb, echo, inside/outside noises, heating or air conditioning, lights, etc.). Equipment (use and familiarization in advance during rehearsals). Spatialisation (placement of speakers or unplugged sound-sources).
Ethical Considerations	QUESTION: *How, where and how loud will the music be performed as to ensure that all active or passive listeners will not be put in any health danger ?*

Table 5.3. *Soundscape Performance Guideline*

The performance of the soundscape improvisation could mark the end of the creative cycle, which might have started several weeks or months earlier, by listening and analysing the original soundscape and proceeding through various experimental improvisations. At the same time, the performance could also mark the deepening of awareness about the particular soundscape and the ecosystem that creates it. It might even lead the improvisers to revisit the original place, approaching it with increased aural sensitivity and empathy. On the creative side, the knowledge and skills gained through these musical explorations[24], might be transferred to other creative projects, especially those in time-related arts such as music, dance, theatre, and cinema.

Improvisation was examined in the above pages as part of the creative cycle towards soundscape awareness, and was located between the phases of Analysis and Performance. During this middle phase, students among other maters would have to decide whether they would use prerecorded sounds and whether or not they would use amplification and spatialisation through loudspeakers. Regardless of their choice concerning the use of electricity in their improvisations and performances, there could be great potential for learning about the soundscape, the medium (i.e. body percussion, acoustic instruments, electrically powered instruments) and about themselves. Given the over-abundance of electrically mediated sounds in everyday life, the following section will propose a creative engagement with a soundscape through a type of 'unplugged' improvisation; an improvisation that will re-focus the students' attention for sound making to a rather ignored primary musical instrument: the human body[25].

The 'Unplugged' Experiment: Group Elemental Soundscape Improvisation (GESI)

A single improviser would be practically impossible to express the complexity of an ecosystem. A group soundscape improvisation allows every participant to personify through sound and movement a single animal character of the particular ecosystem. This allows more time for concentrated preparatory research by individuals so that they would perceive and learn to mimic the repertory of different sounds made by the animal they personify and understand the meanings of these sounds when emitted in the specific habitat. Sometimes several students might even collectively personify a single animal, the sounds of a plant or the sound of an element such as the rain falling on the ground. For the group soundscape improvisation, students have to find their

24 Maria Halkiadaki, postgraduate student and educator, describes an interesting application of soundscape improvisation as an enrichment tool in reading and story telling aimed for people with disabilities. Her assignment > refers to a seminar on Acoustic Ecology, which she carried out with members of the 'Reading for Others Network' in Herakleion, Crete, Greece.

25 Here you can listen to > an example of such a body-based improvisation, performed by a group of kindergarten students who used their voices to recreate the soundscape of a farmers' market in Larissa, Greece (the "market project", carried out by Dimitra Kotsopoulou, postgraduate student in Music Education and a Kindergarten teacher).

personal niche in terms of sound and movement possibilities. They have to keep listening attentively to their own part in relation to the whole, while coordinating and communicating non-verbally with others in the group in order to sonically represent the complete story. On an extra-musical level, by actively negotiating through the aesthetic, the ecological, the cultural, the individual and the social, students may develop a deeper sense of the self and the other (Gibson, 1979; Gibson & Pick, 2000).

In addition to being group driven, the soundscape improvisation proposed here is referred to as *elemental.* The term elemental is chosen to describe its close connection with nature through first-hand experiences expressed musically with our primary instrument, the body. Carl Orff, since 1920s and 1930s (Landis & Carder, 1972) had used the term *elemental* in relation to his music education approach, but the way it is applied here, allows for sound expression and mimicry to be embodied in sound gestures of nature and not basically on rhythmic and melodic patterns of a particular human music culture. One could argue that *Group Elemental Soundscape Improvisation,* goes to the extreme, by being all 'unplugged'. It should become clear that cultural sounds (language, songs, instrumental music, soundmarks) as well as machine sounds could be incorporated in such a soundscape improvisation, under the condition that they would be rendered sonically through the human body with the addition of simple found objects, if and when they form a meaningful component of an ecologically focused story. Despite this, GESI is still 'unplugged' in its realization. This experimental exclusion of electricity in the GESI makes it function as a temporary antidote for the over-domination of electrically modulated sounds; as an 'aural fasting' that aims to *amplify* the affordances of students' bodies as musical instruments in the natural world.

Telling the Story

An Ecological Focus. A GESI in the context of Acoustic Ecology is not just an aesthetic experience which might even produce an aesthetic product (i.e. performance, score, or recording). One of its basic aims resonates well with an aim of soundscape composers and recordists as described by Westerkamp: "to analyse both social and musical meanings and actively speak back to that which we find unacceptable." (Westerkamp, 2001, p. 147). While it might be easy for a group of improvisers to be carried away while producing interesting and aesthetically pleasing sounds, it should be clear that, at all levels of the creative process, work should be driven by ecological thinking (see Westerkamp, 2001). The soundscape improvisation might be planned as a sound story with or without human language and it could even incorporate 'invented' human languages. If the story includes animal heroes, it might be useful to give them names, making thus the identification with them 'as persons' easier for the audience. As a story, it would surely have a title. Let the title be imaginative in its meaning and in how it sounds. The music starts with the title... but also don't forget your ecological thinking, as this starts even earlier!

Local versus Global. The question might arise on the kind of theme that could be used for a soundscape improvisation. Should it be of global or local interest? To a large extent, globalization seems to have contributed to the anaesthetization of humans. In societies where the natural world is approached as a resource for humans, globalization facilitates extractionist practices. If we cannot, for example, as a local society deal appropriately with our toxic waste, we pay and send it away to a remote place. We thus avoid the experience of its negative effects on us, on our family, or on our town, and are not concerned about its negative effects on the people of that remote place. As Leanne Simpson supports: "the alternative [to extractivism] is deep reciprocity. It's respect, it's relationship, it's responsibility, and it's local" (in Klein, 2013, p. 5). Global sensitivity might be seen as a stage of development which could be potentially reached through a deep cultivation of local understanding and empathy, as one moves through life, becoming better able to shift their

attention between the immediate and the distant, the known and the unknown, the concrete and the abstract.

Keeping the primacy of the immediate, the known and the concrete, as an experiential educational focus, local themes of ecological interest could be reviewed from the group as possible themes for soundscape improvisation. For more mature groups, cross-cultural themes could be potentially explored through soundscape improvisations, given that the experience of the 'other place' is based on research and a 'real' visit to that place. Information from sources such as books, videos, recordings, sound installations, art performances, internet sources, pictures, etc., might inform the research, but not be used as a substitute for the 'real' visit to the foreign place. If such a visit is however rather impossible due to adverse circumstances, a human mediator with first hand experience of the foreign place could function as a main resource by sharing their experiences through interviews, suggestions, and by providing critical feedback through the phases of preparation, planning, practicing and performing the GESI. First hand experience of the real soundscape, or at least experience informed through a human mediator, might provide the improvising group with opportunities to acquire a deeper understanding of how humans or other species use sounds in a particular place and culture in order to decipher their environment. Students thus would become researchers of what Feld (1996) refers to as the acoustemology of the particular animal species in that place.

Setting up the Soundscape Scene

Temporal & Place characteristics. One of the central aims of the suggested approach to soundscape improvisation is to create a sense of 'time' and 'place' as a dynamic context for the unfolding sound events. Working towards this end, the group could try to imagine and describe a *place* and *time* where they would choose to *transport* themselves and the audience through their sound improvisation. This particular place and time could be discussed in the group before starting the improvisation. Participants could also decide whether their improvisation would remain more or less in the same scene in terms of time and/or space or move to a different one. In the process of setting up the scene, the group might consider questions such as the following:

- *What time of the year will it be? (season or even month)*
- *What time of the day will it be? (dawn, morning, noon, afternoon, sunset, night)*
- *In which part of the world will it be located?*
- *What kind of habitat will it be? (urban: small, medium, large city, rural, by a lake, in the deep ocean etc.)*
- *Would there be some keynote sounds? Which?* (Schafer, 1994/1977)
- *Would there be any soundmarks? Which?* (Schafer, 1994/1977)
- *Would the listener be stationary or moving?*
- *Would the hero(s) be stationary or moving?*

The Parts and the Whole

Great versus Limited Sound Diversity. Deciding what sound sources would be used and what kinds of sounds would be produced by every one of these could be a solitary and communal work. Every student would explore sound sources (the body and found objects) and ways of making sounds that seem to mimic the animal sounds or the nature processes they have chosen to imitate. The initial exploration, however, would be followed by group critique. At this stage, participants could present their sounds, compare them with the sounds of others and decide whether they are different

enough or very similar with other sounds to the extent that they could possibly cause unintended masking. If, for example, two sounds are perceived as very similar and difficult to differentiate by listening, the students could explore alternative ways of producing them and/or different choices of sound producing instruments, or even different ways of naturally filtering or amplifying one or both sounds.

Foreground versus Background Sounds. In a soundscape, at a given moment, there might exist a number of different sound events (Schafer, 1994/1977). The listener could possibly hear all these events as a whole, but would not be able to listen to every single sound event at the same time, given that sound perception is naturally selective. The animal's attention is turned towards specific stimuli at any given moment, while ignoring other. When the listener interacts with the environment as an active agent, their attention is shifted towards sound events that carry important information for survival, orientation or other intentional acts (Gibson, 1979). This kind of sound events that attract the listener's attention are perceived as foreground sounds, while the rest of them, which remain almost unnoticed, form his/her perceptual background. However, as aural perception is an active and fluid process affected by personal and cultural parameters, what Schafer (1994/1977) refers to as foreground and background sound events in a soundscape, are neither permanent nor universal categories. Sound events might be moved towards or away from a listener's centre of perception at any time[26]. Also while some listeners might perceive a sound event as being in the foreground, others, might perceive it as being in the background. Given the above variability, the basic sound sources and the main sound events might be decided in advance by the members of the group, but flexibility would be allowed for the introduction of new sounds in response to the affordances and 'needs' of the developing improvisation in performance. The group should strive for a delicate balance between allowing space for individual expression, while also creating a dynamic, collective sense of background and foreground in the unfolding improvisation. A constant, active listening to the evolving improvised soundscape is essential for co-creating a sound 'story' with coherence and flow.

Animal sounds in the soundscape. Animal sounds have been a major source of inspiration for human-made music, throughout history, in various parts of the world, including Europe. Modern ways of living have led to the minimization of meaningful relationships between human and non human animals in natural habitats, and seem to have resulted in a reduced presence of animal sounds in human music. At the same time, the development of recording technology has enabled humans to 'capture' and 'store' animal voices. From the first quarter of the 20th century composers started making use of animals' recorded sounds in their music either in intact or edited forms. Biomusic thus emerged as the sampling of natural sounds of animals or plants through recordings for use in compositions. As mentioned in Chapter 1, the composer Respighi is cited as the first to include in his orchestral composition *The Pines of Rome* (1924) an unedited part of a nightingale's song, which was played from a gramophone, in the third movement of the work. More creative early uses of recorded animal sounds have been attributed to the French Musique Concrète composer Pierre Schaeffer, who in the 1950s started sampling animal sounds for his sound collages, while later on several pop musicians and, especially the Beatles, used recorded animal sounds in their songs (Brumm, 2012).

26 The sounds of the leaf foliage of trees caused by the wind is a type of sound that usually remains at the background of human perception especially in contemporary cities. Evaggelia Tsaousidou, postgraduate student and music educator, proposes an Acoustic Ecology project > for secondary education students, which focuses on exclusive listening to the foliage sounds of various trees. Listeners bring these sounds to the foreground, become able to differentiate them and identify the particular tree that produces them, cultivating thus auditory perception and ecological awareness.

While the recorded animal sounds seemed to have sparked the interest and creativity of some composers and still do, things seem to be different for the average human listener. The almost automatic availability of recorded animal sounds seems to have further reduced their motivation to listen carefully and reproduce them with the most accuracy. Recorded animal sounds, presented usually out of context, are often approached as disembodied and meaningless sound effects. The proposed *BEAVER* model, as an emotionally based sound-approach to animals as persons in their specific habitats, could potentially increase the motivation of students to learn about animal voices; to understand their meanings, appreciate their uniqueness and variety, mimic them with the body or with simple instruments and incorporate them in their music, including their soundscape improvisations. In such a context, recordings of animal sounds could function as a supplementary learning tool in the process of developing an accurate mnemonic aural image of an animal's sounds through repeated focused listening.

Sound Resources

The Human Body and Found Objects as Musical Instruments. The human body as a musical instrument has many possibilities, which have been explored and developed in various societies over the years. Some of these possibilities have entered western music education especially with the Carl Orff approach (Landis & Carder, 1972) and more recently with the BAPNE approach (Moral-Bofill, Romero-Naranjo, Albiar-Aliaga, & Cid-Lamas, 2015), increasing the means for musical and extra-musical learning. The sound repertoire introduced by these approaches derives its material basically from rhythmic & melodic patterns and from the forms of classical music. However, the human body could also be used as an instrument to mimic or accompany other types of sound events that occur in a soundscape, beyond human music. The sound resources proposed for this type of soundscape improvisations include all sounds that humans can make with their body (body percussion), with the mouth (with lips, tongue, teeth and cheeks, i.e. clicks, whistles, hisses etc.), with the voice (singing, humming, speech-like sounds, speaking, etc.), with the nose (breathing), as well as sounds produced with objects, other than manufactured musical instruments, which can be found in the ecosystem which is being explored. These "found instruments" could be played in their original condition27 or with minimal alterations that that could be carried out during the process of preparing for the improvisation.

Use of Space

Space and Matter as Sound Modifiers. Space could be approached here as a) the distance and b) the environmental conditions and the material (natural or human-made) that exist between and around the sound producing instrument and the listener. For example, students could ask themselves about the representation of distance in their improvisations, taking into consideration the fact that under the same conditions, lower frequency sounds can travel longer distances than higher frequency sounds. If for instance they would wish to create the impression that several sounds are coming from a great distance, they would emphasise lower sounds and if they included high sounds, they would try to filter-out their higher harmonics by using improvised filters such as curtains behind which to play, cupped hands in front of the mouth etc. Other issues addressed in relation to space as sound modifier could include the tendency of cup shaped (concave) spaces to amplify sounds, the reflective effects of large water surfaces, the reflective or absorbing effects

27 As part of exploring found objects for improvisation, a group of about twenty university students, attending the 2017 Summer Academy at the Department of Music of the Ionian University, produced an improvisation using only metal lids of glass jars. You can listen to this Metal Lid Improvisation here > (Appendix IV).

of different kinds of vegetation etc. The effects of an environmental condition such as a light or heavier breeze blowing in a soundscape would also need to be addressed by the improvisers, not only for its sound producing effects but also for its effects on other sounds and on the soundscape as a whole.

Space as the Acoustic Niche for the GESI. Space here is not meant as a physical place for the realization of the improvisation, but rather metaphorically, as the available silence in the 'real' unfolding soundscape in terms of its overall level of sound energy (how loud it sounds as a whole), but also in terms of the availability of silence –continued or interrupted– in specific frequency bands of the spectrum[28]. Students would be encouraged to investigate and creatively decide when and where their soundscape improvisation will take place and how it will interact with the existing 'real' soundscape. Would they just ignore the existing soundscape and realize their improvisation, with a 'deaf ear' beyond their own sound making, contributing thus to what Schafer (1986) names Schizophonia? Would their improvised soundscape develop as a sensitively adjusted monologue against the background of the 'real' soundscape? Would it unfold in live dialogue with the 'real soundscape'? Or finally, would the group decide to perform their improvisation *in a Box*, meaning a closed protected space, such as a concert hall, a place where the 'live' soundscape of the background is being culturally silenced?

Ways of Listening

A general *active listening* (Westerkamp, 2001; Schafer, 1994/1977) stance is encouraged throughout all stages of preparation and realization of a soundscape improvisation. A flexible movement between what Pauline Oliveros (2005) refers to as 'exclusive' and 'inclusive listening' could assist students in realizing the uniqueness of their 'voice' but also its function within the whole. Listening could also move flexibly between a musical focus, encouraging the perception of the improvisation as a world macrocosmic composition, and a sound-source based focus directing perception and thinking to the meanings of each sound in relation to its source (Schafer, 1994/1977, 1986). Listening with one's body (see Glennie, TED, 2007) is especially encouraged in a soundscape improvisation, which mimics real soundscapes. These soundscapes often include several sound-sources that move around in space. In imitating the sound and movement, for example, of a cat who chases a bird, the cat impersonator may understand better the cat's experience and even hear differently the whole soundscape as they move in space, and finally land on a different 'seat' of the animal-plant orchestra.

In addition to experiencing their soundscape improvisation from the 'inside', it might be educationally useful for students to have the opportunity to also experience it from the 'outside' as *audience*. At times, a few students could step out and become the audience, adopting the role of the *critic* and providing feedback to the rest of the group after hearing a version of the improvisation. By alternating roles between performers and critics, students develop their aural perceptual skills, but also social skills as they practice at giving and receiving constructive criticism.

28 Krause (1993; 2012) introduced the Acoustic Niche Hypothesis (you can find here a related publication), based on his observation that every animal species in a habitat occupies with its voice (sounds) a specific area of the acoustic spectrum, contributing thus to an 'animal orchestra', in which there is acoustic space for every instrument, since some animals produce very low, some low, some medium and so on, and some extremely high pitched sounds.

Conclusion

This chapter attempted to share some educational tools, which I have developed and still keep developing with the aim to encourage students' active involvement with the environment and with non-human animals, through research, sound-exploration and elemental soundscape improvisation in groups. The proposed tools are intended to foster aesthetic, focussed, expanded, ecological and empathic listening, as a means for the re-aesthetization of nature and of our relationship with it.

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Recommended Resources

Academy-All About Birds, online location > : Bird songs and spectrograms. Discrimination between similar but different calls. Good exercise combining audio with visual stimuli.

Part II

SOUNDSCAPE AWARENESS AND PRACTICAL APPLICATIONS

Chapter Six

Creative use of musical traditions within the framework of soundscape awareness in music education: Examples from Greek folk music

Zoe Dionyssiou

Traditional songs are musical material that can be used in music education in many creative ways with an emphasis on sound awareness. Some traditional songs from various areas of Greece will be presented here as examples of how they can be used within a methodology for listening to the soundscape. Some of the selected songs refer to folk customs, such as the custom of the swing, the custom of rain invoking, and work songs. The Music Education Group of the Ionian University *Aneva Milo - Kateva Rodi* has piloted these songs in performances over the past eight years[29]. The experience we have gained from the group's performances has proved that folk songs can bring the listeners closer to memories, sounds and traditions of the past. They can also be used as a tool for intergenerational collaboration, interdisciplinary and intercultural partnerships, as well as a tool for developing students' creativity and critical thinking.

A. Folk custom songs

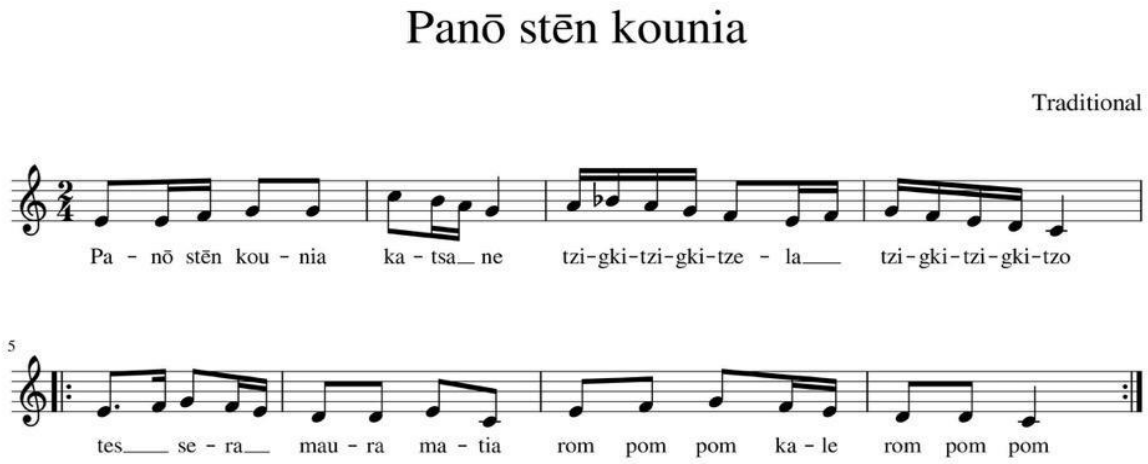
Traditional songs refer to or accompany children's or adults' folk customs such as: the custom of the swing, the custom of rain invoking, matriarchy, carnival songs, songs for St. George's day, for St. Lazarus' day, Easter songs, May songs, Fire walking songs, work songs, etc. (Michael-Dhedhe, 1987). They are often called 'magic songs', because they accompany customs through which people invoke some supernatural, mysterious or magical energy to help them at a particular time (change of weather, catharsis, redemption, rebirth, consolation, etc.). Two customary songs follow below: the custom of the swing and the custom of rain evoking.

a) The custom of the swing

It is a custom that dates back to Greek antiquity. A celebration that took place on the "New Monday", the Monday of the Easter Week (or the whole first week after Easter), during which young women and men set up swings in the countryside and celebrated with a feast. The

29 The Music Education Group of the Ionian University *Aneva Milo - Kateva Rodi* was founded in March in 2012 by Zoe Dionyssiou and students from the Sector of Music Education and Psychology at the Department of Music Studies. The aim of the group is to promote oral speech and folk music tradition through folk songs, fairytales, singing games and customs. The material presented at the performances comes from literature, oral testimonies and ethnomusicological and folk research. The group carries out performances and workshops for both children and adults and so far more than 60 performances have been put on.

celebration of Easter coincided with the coming of spring, and the custom of holding services in the nearby chapels. The custom symbolizes the new vegetation, the regeneration of nature, and people's mating (Michael-Dhedhe, 1987).



Panō stēn kounia

Panō stēn kounia katsane,
zigkitzigkitzela, tzigkitzigkitzo
tessera maura matia,
rom pom pom, kale rom pom pom
Tessera phrydia san spathia,
tzigkitzigkitzela, tzigkitzigkitzo
kai dyo kormia rēgata,
rom pom pom, kale rom pom pom
Sidero einai to skoini,
tzigkitzigkitzela, tzigkitzigkitzo
kardenio to sanidi,
rom pom pom, kale rom pom pom
Tetoia koritsia poupoulo,
tzigkitzigkitzela, tzigkitzigkitzo
einai kathario asēmi,
rom pom pom, kale rom pom pom

Over the swing

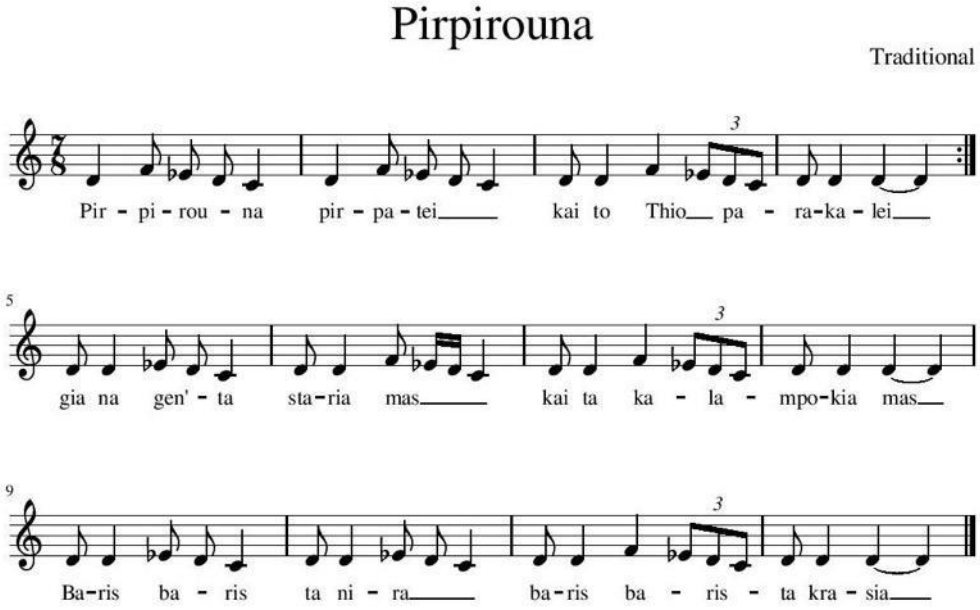
Over the swing they are sitting,
tzigkitzigkitzela, tzigkitzigkitzo
four black eyes,
rom pom pom, kale rom pom pom
Four eyebrows like swords,
tzigkitzigkitzela, tzigkitzigkitzo
and two delicate bodies,
rom pom pom, kale rom pom pom
The rope is like iron,
zigkitzigkitzela, tzigkitzigkitzo
the wooden seat is like nut-shell,
rom pom pom, kale rom pom pom
Such girls, light as feathers,
tzigkitzigkitzela, tzigkitzigkitzo
they are worth more than pure silver,
rom pom pom, kale rom pom pom

A. Sound as movement: This traditional song becomes an occasion for creating sounds and movements that the swing can do. Explore the movement of the swing and the changes in sound when rocking takes place. Explore the changes in the sound during various types of movement (soft or intense rocking, rotary motion, jogging, etc.), experimentations and recordings of various sound events. Emphasis on the words 'tsiki-tsiki-tsela", "tsiki-tsiki-tso" and "rom-pom-pom" which are a rhythmic-poetic 'addition' to the main lyrics of the song. Explore movements to accompany these sound words. Perform the song with movements to accompany each phrase of the song, e.g. the sense of rocking and the sense of playfulness in the rhythmical words 'additions' in the song.

B. Sound as a means for sound creation: Perform the song with musical instruments, use Orff orchestration techniques (ostinato, bordun, descant, improvisation) and write new song lyrics.
C. Sound as connection to the environment: Create soundscapes that are found in nature during spring (migratory birds arriving in the Mediterranean, swallows, frogs, etc.).
D. Sound as a link to culture: Explore environmental issues and the changes in the relationship between humans and nature in the past and today, the change of soundscapes in squares, playgrounds and generally where children used to play in the past and play today.

b) Song for invoking rain: the custom of Pirpirouna

The custom of Pirpirouna (or Perperouna or Piperitsa) used to take place in many places around North Greece during periods of drought. A group of girls or young ladies used to dress a girl in branches, placing them around her body and on her head so that she looked like a bush. They called her Pirpirouna. The girls, together with Pirpirouna, visited the houses around the village singing the song below, while the housewives poured a bit of water on the Pirpirouna girl. According to the tradition, it would start raining shorty after the custom took place.



Pirpirouna	**Pirpirouna**
Pirpirouna pirpatei	Pirpirouna is walking
kai to Thio parakalei	and she is praying to God
gia na vrexei mia vrochē	for a rain to come
mia vrochē mia siganē	a soft rain
gia na gen' ta staria mas	so our crops
kai ta kalampokia mas.	and corn will grow,
Baris baris ta nira,	So much water
baris baris ta krasia	so much wine

A. Sound as movement: Explore the sounds of rain and the movements it can cause to the environment: students represent nature in a period of drought and are invited to explore different

kinds of movements that rain may cause to the environment (humidity, drizzle, mild rain, heavy rain, heavy rain with wind, rain with thunder, summer sudden rain, etc.). A student makes the sounds that the various types of rain cause by using his/her body, voice and sound-producing objects. Students must understand the sound stimulus and move accordingly.
B. Sound as a means for sound creation: Perform the song with musical instruments, Orff orchestration techniques (ostinato, bordun, descant, improvisation), write new lines for the existing melody. Dramatise and perform the custom musically. Explore ways of producing the sounds for the different types of rain using sound producing objects, musical instruments, bottles, human body, voice, etc. Perform and record them. Create a graphic score that depicts each improvisation. Create group improvisations associated with soundscapes of rain based on different scenarios (e.g. mild rain that gradually becomes stronger with thunder, mild rain, strong rain with wind, rain followed by a rainbow etc.).
C. Sound as connection to the environment: Improvise and create soundscapes that depict drought images that are gradually converted into soundscapes of rain. Improvise soundscapes inspired by images depicting drought landscapes in different places of the world. Explore the phenomenon of drought, causes and ideas for possible solutions in our region or country. Inform peers and/or citizens about the consequences of drought in our area. Record soundscapes depicting drought and humid regions, so that students can understand the different soundscape from listening only. Create and record soundscapes based on water (drops, fountains, rains, storms, sounds in the water, etc.), so that students can recognize the soundscapes.
D. Sound as a link to culture: Research songs related to rain invocation during periods of drought in other cultures. Listen to soundscapes and improvise producing similar compositions in class.

B. Work songs

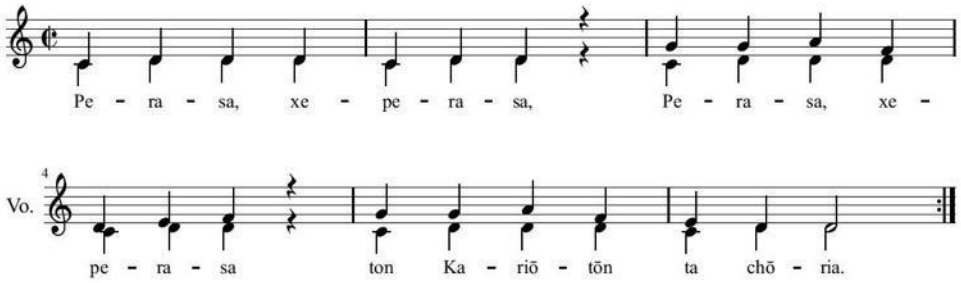
The work songs were sung during work in order to help the group achieve better coordination, as well as psychological and social cohesion. Work songs in the Greek tradition have been recorded with references to various activities (land cultivation, fishing, picking olives, processing the olive oil, etc.). Some well-known work songs are: H trata mas i kourelou, Kaliora na houn oi elies (Kato Garouna of Corfu), Oi Kariotes, Gio Mario (Tsesme, Asia Minor), Harman Geri (the threshing floor, Caesarea of Cappadocia), Che ithela na xero (Griko dialect, Salento of South Italy), etc. Most work songs usually follow a strong beat that helps people to synchronize and interact with each other, which is necessary for good coordination in the group.

c) Hoi Kariotes (Mazaraki, 1970)

Photo 6.1. The Music Education Group of the Ionian University *Aneva Milo - Kateva Rodi* performs the work song 'Hoi Kariotes'.
Here is a video > of a performance of this song by *Aneva Milo - Kateva Rodi.*

Hoi Kariōtes

Traditional



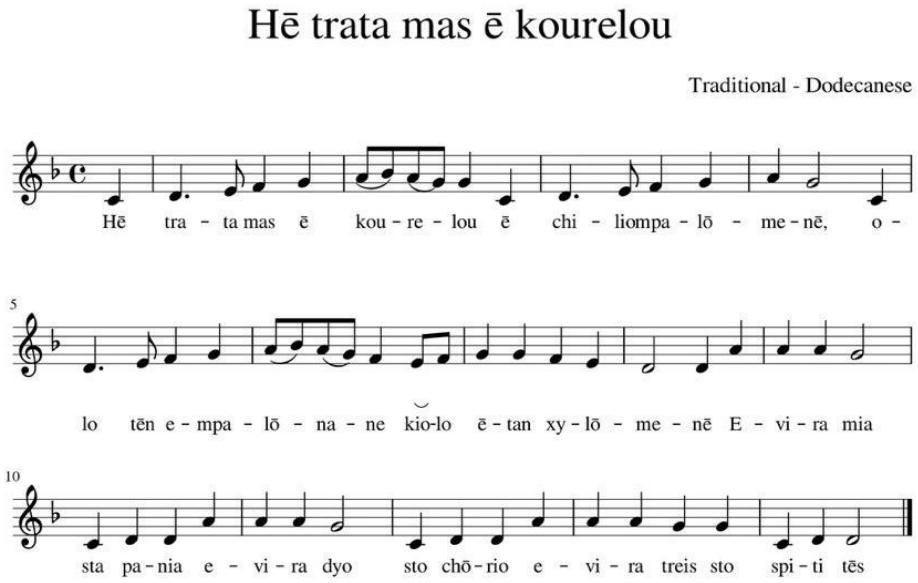
Hoi Kariōtes
Perasa, xeperasa (2)
tōn Kariōtōn ta chōria
Ki eida pōs ta spernane (2)
hoi Kariōtes ta koukia
Etsi da ta spernane (2)
hoi Kariōtes to koukia
Ki eida pōs ta potizan (2)
hoi Kariōtes ta koukia
Etsi da ta potizan (2)
hoi Kariōtes ta koukia
Ki eida pōs megalōnan
hoi Kariōtes ta koukia
Etsi da megalōnan (2)
hoi Kariōtes ta koukia (2)
Ki eida pōs ta vgazane (2)
hoi Kariōtes ta koukia
Etsi da ta vgazane (2)
hoi Kariōtes ta koukia
Ki eida pōs ta trōgane (2)
hoi Kariōtes ta koukia
Etsi da ta trōgane (2)
hoi Kariōtes ta koukia

Hoi Kariōtes
I passed by and passed again (2),
the villages of Karia
and I saw how people from Karia (2)
sow the broad beans
This way they sow them (2)
people of Karia sow the broad beans
And I saw how people from Karia (2)
water the broad beans
This way they water them (2)
people of Karia water the broad beans
And I saw how people from Karia (2)
grow the broad beans
This way they grow them (2)
people of Karia grow the broad beans
And I saw how people from Karia (2)
reap the broad beans
This way they reap them (2)
people of Karia reap the broad beans
And I saw how people from Karia (2)
eat the broad beans.
This way they eat them (2)
people of Karia eat the broad beans

A. Sound as movement: This traditional work song can be associated with sounds and movements in relation to agricultural work. Perform the song with mimetic movements that depict every phrase (sowing, scraping, watering, raising, harvesting, eating, etc.). Sit on the floor in a circle. Practice rhythmic synchronization by using various objects (stones, beans, wood, maracas, etc.) that students have to pass to their next classmate in the pre-decided direction (all using their right hand only or left hand only). In each phrase of the song the class can change the direction of the circle when

passing the objects. Students perform the song while walking rhythmically in a circle and stress the strong beat hitting a large stick on the ground. On every strong beat they take the stick from the person in front of them and allow the person behind them to take theirs. This process has to be done in time.
B. Sound as a means for sound creation: Perform the song with musical instruments, using Orff orchestration techniques (ostinato, bordun, descant, improvisation). In groups write new lyrics for the existing melody on another activity, depending on students' interests.
C. Sound as connection to the environment: Create soundscapes of nature during working in agricultural, or other work-related tasks (fishing, sheep guarding, picking up olives, etc.). Explore soundscapes in different environments related to these, using pictures or text about jobs of the past and today. Create music improvisations based on different scenarios, e.g. students represent the fishermen who gather the nets by singing each song at different tempos.
D. Sound as a link to culture: Explore environmental issues, changes in the relationship between humans and nature in the past and today through work. Research and listen to work songs from other cultures (e.g. blues work-songs) and attempt to dramatize the song with movements related to corresponding jobs.

d) He trata mas e kourelou



Hē trata mas ē kourelou	**Our trawl the patchwork**
Hē trata mas ē kourelou	Our trawl the patchwork
ē chiliompalōmenē	which is a thousand times patched
olo tēn empalōnane	they would always patch it
kiolo ētan xylōmenē.	but it always remained unwoven.
Evira mia, sta pania	Heave ho once, to the sails
evira dyo, sto chōrio	heave ho twice, to the village
evira treis, sto spiti tēs.	heave ho three times, to its home.
An to xere ē mana mou	If my mother knew
pōs douleva stēn trata,	that I worked in the trawl
tha mou stelne ta roucha mou	she would send me my clothes

kai tēn palia mou vraka.	and my old breeches.
Evira mia, sta pania	Heave ho once, to the sails
evira dyo, sto chōrio	heave ho twice, to the village
evira treis, sto spiti tis	heave ho three times, to its home.

A. Sound as movement: This traditional work-song gives rise to the creation of sounds and movements associated with various jobs in the sea. Perform the song making steps or any other pre-set movement on the strong beat. Students practice in rhythmic synchronization using various objects (stones, beans, wood, maracas, etc.), which they pass to their next classmate in a pre-decided order. In each phrase students can change the direction of the circle when passing the objects. Perform the song with dance and rhythmic movements: during the verse students dance in a circular arrangement, during the chorus students are divided into two groups and pull a rope in rotation.
B. Sound as a means for sound creation: Perform the song with musical instruments, using Orff orchestration techniques (ostinato, bordun, descant, improvisation). In groups write new lyrics for the existing melody referring to fishing traditions. Students research fishing work in their country. If they can have access to fishing boats in their area, they record fishermen during their work and make a composition using extracts from these soundscapes.
C. Sound as connection to the environment: Improvise and compose soundscapes related to fishing activities (throw nets, gather nets, collect fish, etc.). Explore the sounds related to fishing work in various environments based on pictures or descriptions of the profession in the past and today. Create improvisations based on different scenarios, e.g. students represent the fishermen who pull the nets by singing each song at different tempos.
D. Sound as a link to culture: Explore the environmental issues and changes in the relationship between humans and nature in the past and nowadays, from the point of view of *work*. Trace and listen to songs related to fishing activities in other cultures. Discuss the negative effects of fishing endagered species or fishing using unsustainable methods.

Conclusion

Through the examples of the above songs we tried to look at how they can inspire activities for movement, exploration of sounds, creation, connection to the environment and culture. Traditional songs and games can be a reason for the study of intangible local musical traditions, which in turn can bring us closer to the environment and to people.

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Chapter Seven

An Educational Approach to recordings from 'The Soundscape we live in'

Ioanna Etmektsoglou

Introduction

This chapter is based on recordings of soundscapes from a variety of environments, made by participants in the Erasmus+ Program "The Soundscape we live in". The reader can find many more recordings for listening and analysis on the website of this Program. The soundscapes cover a wide range of contexts, including different qualities, living beings and/or machines. The selection of recordings for analysis in this chapter was not based on strict criteria. Familiarity drove the writer's choice to initially approach a number of recordings from Greece and then some material from Italy, France and Portugal followed. However, despite the author's wish, time limitations did not allow for an equal representation of all four participating countries. The limited examination of the recordings and accompanying comments and pictures, nevertheless, revealed the existence of a wealth of material with important educational implications, still to be explored in the future. The recordist's comments, informing the listener about the context of the particular recording and their own perspective and intentions, appear —in edited form— as an introduction to the listening experience, along with accompanying pictures and other detailed information, which are available online at the Program's web site; the title of each recording in this chapter is an active link to this material. Specific educational activities, suggested by the author of this chapter, frame each recording, aiming to foster critical listening and thinking as well as to encourage creative practices.

Recording no 40: 'Siora Tsotso' ▷

Place of recording: Recording Studio, Department of Music Studies, Ionian University, Corfu
Name of recordist: *Andreas Mniestris / amnies@gmail.com*
Date of recording: 20/06/2017, 11.00 am

Recordist's notes:
A typically uneventful recording in a (non professional, in terms of acoustic 'correctness') studio. Some EQ correction was made in a postproduction phase in order to remedy the particular coloration of the recording room. Ethnological interest: linguistic aspects, local cultures, life's sounds, public events, the recording's surroundings. Due to globalization, there is rapid deterioration in the function of oral tradition and the fundamental level of the utterance of language. The purpose of this recording is to give a snapshot of Corfiot Greek, i.e. the way the Greek language was spoken in the villages of Corfu, which has two basic characteristics: the intense tonal inflection in accent and the plethora of modified Italian words as 'dialect'. The

educational purpose and possible uses of this recording could be a demonstration of 'musicality' (in terms of rich tonal content) within everyday speaking practice, therefore cultivating methods and modalities of listening to a language to Greek native speakers as well as a demonstration of how a local Greek dialect sounds like to non Greek speakers. In particular, the partners of this project whose native languages are latin-based could use it to compare with their own languages/local accents/dialects.

Tags: sounds of Corfu; cultural heritage; female voice; local dialect of Corfu; Greece
(Special thanks to Zoe Dionyssiou for contacting Siora Tsotso for this recording)

Writer's Suggestions:
Ask Greek students to listen to the text several times and produce a list of unknown words. Based on the context, could they guess the meanings of these words?

Talk about changes in languages and what might cause these changes i.e. globalization, travelling, less contact with nature (organisms and natural phenomena), cultural changes (i.e. changes in clothes), influences by neighbouring countries or by war occupiers, etc.

Students from other countries can listen to the recording and try to identify any words that might sound similar to words in their own language.

All students can try to record or learn excerpts in a different dialect or from people in their community who might still speak older versions of their own dialect. What changes do they observe and how might they explain them?

Below is an expression in Modern Greek describing the moment before sunset and the corresponding description by Siora Tsotso in the old Corfiot dialect. What differences do you observe in the two descriptions? How would you explain these differences?

"μια στιγμή πριν τη δύση" compared to*: "ένα ειδίασμα, τότσο πριχού το κάθισμα του ήλιου."*
"mia stigmi prin ti dysi" compared to: "ena eidiasma, totso prichou to kathisma tou iliou."
("a moment before sunset" compared to "a glance, just so little before the sitting of the sun")

Recording no 43: 'Summer Symphony for Storm and Cicadas' ▷

Place of recording: Piazza Trento e Trieste 3/3, Bologna, Italy
Name of recordist: Agnese Banti / *agnese.banti@gmail.com*
Date of recording: 26/06/2017

Recordist's notes:
The temperature in Bologna during those days was around 40° degrees. A heavy downpour started suddenly whilst the cicadas were singing. The recording took place on the balcony. There was the poetry of summer storms as the cicadas were changing their rhythm of singing whilst the water was increasing in intensity

Tags: storm; rain; city; cicadas; symphony; Bologna; Italy

Writer's Suggestions:
Masking towards the end of the recording: rain sounds mask the cicadas' sounds. Arrhythmias are heard in the cicadas' choir but the cicadas keep being active despite the rain! (Discuss the possible effect of high temperatures: 40°C).

Discuss what masking is. What sonic characteristics of the rain make it possible for it to mask the sounds of the cicadas at certain points?

Think of other possible masking sounds in wild habitats, rural and urban places. Is there a prominent masking sound in the area where you live? If so, name it and describe it. Refer to:
a) its sonic characteristics
b) its meaning in your culture
c) its effects on other sounds
d) its effects on you
e) its effects on other organisms in the area
Do you think that it should be changed, or not? Why?
In your decision, consider how much and for how long the particular sound masks other sounds, to what degree it affects negatively organisms of the ecosystem and how it is valued in your society.

Photo 7.1. A game by Elina Kalampokini: Two people are trying to read their parts of a story aloud, while masking sounds are introduced through the computer. A third person (listener) tries to understand the plot of the story. This activity was part of the Summer Festival 2018 of the Alternative Laboratory in Corfu, Greece, as part of the educational activities of the Erasmus+ Program *The Soundscape we live in.* Its description, along with other games, is attached here > (Appendix II).

Recording no 44: 'Audio picture of Xm24' ▹

Place of recording: Piazza Trento e Trieste 3/3, Bologna, Italy
Name of recordist: Agnese Banti / *agnese.banti@gmail.com*
Date of recording: 30/06/2017

Recordist's notes:
'Xm24' is a historical place in Bologna, which is completely self-organized. From a social and cultural point of view, and for a long time, it has been crucial for many people. The authorities of the city decided to force its closure and ordered its evacuation by the 30th of June. On June 30th a day with markets, food, drinks, live music, and juggling shows was organised by different communities and a very large number of people, especially the younger generation, came to celebrate 'Xm24' and stand with its people. The recording took place standing at the edge of the place among people talking, eating, passing, meeting etc. The audio is a testimony of an important demonstration of the city to stand with the realities of 'Xm24' in Bologna: a lot of sounds from a lot of people of different color.

Tags: Xm24; life; people; testimony; solidarity; event; photography; Bologna; Italy

Writer's Suggestions:
Discuss the major role of the voice in the community. What sounds besides the voice can you distinguish in this recording?

Compare your impression of heavy rain sounds in other recordings with the massive vocal sound tapestry that you hear in this recording. How differently do we hear the voice of a crowd from the sounds of heavy rain, even if we cannot understand the language?

Activity: Use a song about the rain from your country. If you cannot find one, create one in your class. Divide the class into two groups. The first group imitates the sounds of the rain using body percussion including beat boxing, while the second group recites the poem, each one from this group starting at a slightly different time, with a staccato articulation in their voice. What do you notice when listening to the sounds of the two groups? How do they sound, similar or different? Now try to change something in the second group: recite the poem as above, but leave out all vowels from the words and perform only the consonants (not so easy!). Combine the two groups, the one with the body percussion and the other with the vowels' poem for the rain, and compare the results. Are the sounds of the two groups as a whole more or less similar than before? Why?

Recording no 45: 'Lake's speech on a windy day' ▷

Place of recording: Lago di Bilancino, Barberino di Mugello, Tuscany, Italy
Name of recordist: Agnese Banti / *agnese.banti@gmail.com*
Date of recording: 01/07/2017

Recordist's notes:
This lake is one of the largest artificial lakes in Europe. The waves come and go on the shore in loops. The recording took place on a windy day with the stereo microphone placed on the ground with a protective cover to eliminate the sound of the wind. The recordist aimed to give the experience of listening from close to the ground.

Tags: wind; speech; water; Mugello; Tuscany; Italy

Writer's Suggestions:
What do we mean when we say the 'voice' of a lake?

Visit a lake (small, medium, large, it doesn't matter) in your area. Listen to it and try to think in what ways it sounds different from the recording of the lake 'di Bilancino'.

Then, record your lake and try to compare the two recorded lake soundscapes:
What is the characteristic voice of the lake di Bilancino? Deep sounds from stones? Higher sounds from bubble cavitation? Fast or slow tempo? What is the tempo roughly (beats per minute)? That recording was done on a windy day. How different would the lake soundscape be if the recording had occurred on a calm day?
What is the characteristic voice of your lake?
How different are the voices of the two lakes and why do you think this might be?

Recording no 46: 'Chats of hidden birds in bushes' ▷

Place of recording: Lago di Bilancino, Barberino di Mugello, Tuscany, Italy
Name of recordist: Agnese Banti/ *agnese.banti@gmail.com*
Date of recording: 01/07/2017

Recordist's notes:
During a cycle ride by the waterside, birds were talking. The recording took place near a bush where the birds were hiding, probably in their nest. The birds could not be seen but only heard. A conversation among the birds in the bushes was happening although not understood by people.

Tags: birds; chatty; bushes; lake; Mugello; Tuscany; Italy

Writer's Suggestions:
What kind of birds can you recognise in this recording? (If you don't know, try to find out from a bird specialist). When do you hear a dog in the recording? How far do you think the dog is from the recorder?

Subjects to be discussed: Keynote sound: the sound of the lake, Foreground: bird calling. Repetition/variation in bird calling.

Recording no 47: 'Glimpse of a Summer Woods' ▷

Place of recording: Piedimonte forest, Appenino Tosco-emiliano, Italy
Name of recordist: Agnese Banti/ *agnese.banti@gmail.com*
Date of recording: 03/07/2017

Recordist's notes:
In this forest, there are cicadas, birds, insects and in the middle of it a little river -called Aghezzola. There are plenty of different sounds. I wanted to grasp this purity of sounds from a pure, natural place. Compared to human sounds, it sounds like silence, but there is buzzing and moving through the two stereo channels at the end of the recording. It is possible to see a parallelism between that and the helicopter passing at the beginning of the recording.

Tags: summer; woods; bugs; buzz; cicadas; birds; river Appennino; Italy

Writer's Suggestions:
How dominant are a) the cicada sounds and b) the sounds of water?

The sound of a bug buzzing close to the mic is heard clearly *(Discuss the different frequency range (acoustic niche) and the closeness to the listener/mic).*

How much does distance affect the volume of a sound? A little or a lot? Why do you think so? (Sound is a spherical wave and propagates outwardly from its source in all directions of an imaginary sphere. In doing so, it very quickly loses a large amount of its energy. The increasing radius of the 'sphere' as the sound propagates outward from its source results in the ever decreasing intensity of the sound. Therefore, if the bug had flown past a couple of meters away from the microphone, we might not have heard it in the recording.

Older students might be introduced to the *Inverse Square Law:* read about it here >.

Discuss the possible positive and negatives effects of this law of physics: a) on human or other animal communication, b) on the design or planning of buildings such as schools and hospitals.

Stridulation is a mechanism for sound production through rubbing together special body parts (you may find out more here >). Name different animals, which use stridulation for sound production. Name musical instruments that use stridulation for sound production.

Why is the resin necessary for the production of sound by the violin bow? (Try to find out about the stick & slip mechanism in sound production.)

Compose a song that includes sounds made through stridulation (experiment with everyday objects such as different kinds of combs, the plastic spiral of notebooks etc.).

Recording no 53: 'Surrounded by the Tschäggättä bells at the Wiler Carnival'. ▷

Place of recording: Wiler village, Lötschental Valley, Palazzuolo sul Senio, Italy
Name of recordist: Emiliano Battistini / *emibat2@gmail.com*
Date of recording: 25/02/2017, 17:27

Recordist's notes:
Placed on the German side of the Valais Wallis Canton in Switzerland. The Lötschental Valley has a number of strong folkloric traditions, with the carnival being the most important. In the past, especially in wintertime, it was very difficult to reach the Valley and this is one of the reasons why until today, these traditions have been preserved almost untouched. The famous Tschäggättä are the main figures of the carnival in the Lötschental villages: men dressed in sheepskin, wearing frightening carved wooden masks with a walking stick in hand and a big cow bell on their belt, represent the winter evils. In the past, young single men dressed in this outfit would chase and scare young women throwing snow down their chest. Today, under the Tschäggättä masks, there are boys and girls, young and old, who parade through the village in front of tourists' and travellers' cameras. But, as the parade approaches the end, the situation changes and the Tschäggättä run after the tourists and the locals, provoking a big game where the continuous and high bells' sounds dominate. During the whole carnival period, the sounds of the Tschäggättä

bells can be heard from a long distance and are distinctive of the soundscape of the Lötschental villages, such as the Wiler. The recording of the Tschäggättä bells took place when the carnival parade was approaching the end and the masked villagers were running after the public in all directions. Sounds are heard from different sources creating an interesting soundscape. Also, as they vary in shape and size, the Tschäggättä bells produce different sounds and different timbres.

Tags: folklore; Lötschental; carnival; Tschäggättä bells; Italy

Writer's Suggestions:
What are the relationships between bell sounds, human voices and other sounds as heard in the recording? (Discuss these in terms of similarities and differences in timbres, loudness, melodic and spectral characteristics, rhythms or any patterns of periodicity, meanings and significance for the locals and the tourists etc.).

Is there a carnival event in your area? Describe its soundscape. (Human voices, other sounds? Non-amplified versus amplified sounds? Balance between different kinds of sounds? Masking?)

Recording no 54: 'Melting snow in Evolèn' ▷

Place of recording: Evolèn village, val d' Hérens, Switzerland
Name of recordist: Emiliano Battistini / *emibat2@gmail.com*
Date of recording: 26/02/2017, 17:04

Recordist's notes:
In the main street of the Evolèn village, which is situated on the French side of the Valais Wallis Canton, the carnival takes place amidst sounds of traditional masks and bells. However, in the calm and silent back streets, snow melts on the roofs of the traditional wooden houses and drips to the ground filling the surroundings with the sound it produces. The sound is distinctive of snow consistency and of snow turning into water. From the quality of this sound we can realize that it is about melting snow or dense water, in a state of development. The meaning of the sound is also dense. When snow is turning into water, it is the time of the year when seasons are changing and winter is turning into spring. The arrival of spring is of great importance to mountainous villages, such as Evolèn. When snow melts, it is possible to cultivate the fields again, to keep the cows in the pastures and reach places that were inaccessible during the winter. The sound of melting is now the sound of change and hope and signifies intimacy and reflection. While the whole village is celebrating the carnival with music and bells, the sound of snow melting greets those who leave the place to go home for a while and come back later. The recording is a good example of the sound of a substance turning from solid to liquid. The sound resonates in silence and its volume is amplified while bells can be heard at the background of the sonic horizon. The silence in this back street in the historic centre of the village is framed between the sonic figure of the melting snow in the foreground and the sonic figure of bells in the background. Precious silence stands between them.

Tags: melting snow; Evolèn carnival; Switzerland

Writer's Suggestions:
At which point in the recording do you notice the sounds of the carnival for the first time?

What sounds do you perceive as 'foreground' in the recording, and what sounds as background?

Try to notice the sounds of the carnival; What happens to the sounds of the melting snow? Are they at the foreground or at the background?

What is an important environmental sound that is associated with the feeling of 'hope' in your community?
What is a soft sound that is especially valued in your community? When and where does it happen?
What is a loud sound that is especially valued in your community? When and where does it happen?

Recording no 55: 'Airplane, boat and waves at Serchio's mouth' ▷

Place of recording: Marina di Vecchiano, Pisa, Italy
Name of recordist: Emiliano Battistini / *emibat2@gmail.com*
Date of recording: 10/04/2017, 16:54

Recordist's notes:
The recording took place on a sunny April afternoon on the north side of the mouth of the Serchio river on the Tirrean Sea, inside the Migliarino San Rossore Massaciucoli, Natural Park at Marina di Vecchiano, province of Pisa in Italy. On this side of the river there is a little dock where motorboats and rowing boats are berthed. There are also a few retired fishermen. The place is peaceful while birds and insects can be heard singing. Suddenly, the peace is broken as a small motorboat approaches and waves crash against the riverbank making a distinctive sound. Almost at the same time, a propeller airplane flies past. Later, the soundscape returns to its previous peaceful state. The recording is an example of the way a natural, rural soundscape is temporarily affected by human-produced sounds to return again to its initial state. It is interesting to explore the development of the sound of the waves: it starts low and slowly, then increases, reaching a peak to finally decrease little by little. The sounds by the motorboat and the airplane both have a drone quality but different timbre, intensity and speed, creating different horizontal lines on the sound spectrum. Also, the two acoustic events, the sound of the motor of the boat and the crashing sound of the waves, are separated by an interval of silence. Silence is crucial in the whole event.

Tags: airplane; boat; waves; Serchio river; Tirrean Sea; Italy

Writer's Suggestions:
When in the recording can you hear the sounds of water for the first time?

When in the recording can you hear the sound of the airplane for the first time? Hum the sound of the motor of the boat and then the first sound of the airplane. What melodic interval do they create? (Augmented 4th possibly? If so, listen to the song *Maria* from the 'West Side Story' by Gershwin and find this interval).

Is there any time when you cannot distinguish the sound of the airplane from that of the boat? If so, when?
When do you think the waves have the most energy? How would you describe the sound characteristics of the waves in their climax?
When do you stop hearing the waves?

Is there a sound that you hear after the silencing of the two motor sounds and the waves that were caused by the boat? Perhaps a sound that you had not heard even at the beginning of the recording? Describe this sound.

Recording no 56: 'The shore of Marina di Vecchiano beach (Pisa, IT)' ▷

Place of recording: Marina di Vecchiano, Pisa, Italy
Name of recordist: Emiliano Battistini / *emibat2@gmail.com*
Date of recording: 10/04/2017, 18:41

Recordist's notes:
The recorder was placed at a distance of one meter from the shore, on the Marina di Vecchiano free beach, Tirrean Sea, province of Pisa, Italy. It is late afternoon in a day with wonderful sunshine at Migliarino San Rossore Massaciuccoli Natural Park. On the north side of the mouth of the Serchio river, a free sandy beach runs all along the Tirrean Sea. On the beach there are some branches and washed out from the sea, that are carved in various shapes. Between the sand of the shore and the Mediterranean scrubs and the maritime pine, a large part of the beach is covered by shrubs, rushes and logs. The wind is moderate but strong enough to animate the sea: medium size waves spill onto the beach or break some meters before reaching the shore, producing marvelous sounds.
I had a specific interest in recording the Tirrean Sea sound on the Marina di Vecchiano sandy beach. I come from a city, Rimini, that has quite a similar beach, more or less at the same geographic height, but located on the Adriatic Sea: I wanted to see if the sound of the Tirrean Sea was similar or different to the sound of "my" sea. Thanks to the listening that took place at the beach of Marina di Vecchiano I can say that the two Seas have a different sound: being more open and in direct contact with the rest of the Mediterranean Sea, the Tirrean Sea has a different character and force when interacting with the beach, producing quite a different sound. Moreover, as Bernie Krause says in his book 'The Great Animal Orchestra', the sound of the sea changes because of the different shapes of the beach and coast. During the incessant and dynamic re-shuffle of the sea, even if its sound seems to always be the same on the macro level, on the micro level it is never the same.

Tags: Tirrean Sea waves; Mediterranean sandy shore; Marina di Vecchiano beach; Pisa

Writer's Suggestions:
Based on the sounds you hear from the recording, what kind of beach do you think it is? Is it rocky, with small pebbles, or sandy? Is it a beach of a small sea or is it a beach open to an ocean? What were the weather conditions during the recording? Was there any wind? Any rain? Other?
Did you hear any other sounds besides the waves breaking in this recording?

In a group of 5-8 people, try to imitate the sounds of this particular beach. You can use different sizes of plastic washing tubs with various kinds of small objects inside such as lentils, rice, small pebbles, sand, etc. Choose the containers and the small objects carefully, experimenting with their sounds in correspondence with the recorded sounds of the particular beach. Pay special attention to the dynamics, the tempo and rhythms of the spilling and/or crashing waves.

Search in this booklet > to find out what are shrubs and rushes. Look at the provided pictures and try to imagine what kinds of sounds these plants would make on a sandy beach like the Marina di Vecchiano, on a windy day.

Recording no 57: 'Midday at the Vaglia Railway Station (Tuscan Apennines)' ▷

Place of recording: Vaglia railway station, Florence, Tuscany, Italy
Name of recordist: Emiliano Battistini / *emibat2@gmail.com*
Date of recording: 11/04/2017, 12:29

Recordist's notes:
Platform 1 at the Vaglia Railway Station, province of Florence, Tuscany, Italy. It is a few minutes past mid-day, and I am on the principal platform of the little railway station of Vaglia, a little village of the Tuscan Apennines waiting for the train to return to Florence. This railway station is known for its beauty: a small train links Florence (Tuscan region) and Faenza (Emilian-Romagna region) crossing the wonderful landscapes of the Tuscan Emilian Apennines. The Vaglia railway station is small and it is like an old-time architectural organization: some families live in the principal building of the railway station, probably including the station-master's family. At this hour there is nobody and the silence of the place makes it possible to listen to the sounds that come from one of the windows of the building on the platform: the clearing of the table and the volume of the television allows us to surmise that some people have just had their meals few minutes ago. However, the real protagonist of the place is a continuous and 'multi-coloured' birdsong that comes from the woods over the rails in front of the train station. From the different parts of this choir, it is possible to understand that different species are present and all of them are singing to greet springtime that has just arrived.
This recording is interesting due to the combination of two different sonic planes that marry themselves in the silence of the small and peaceful railway station of Vaglia: on the one hand, the continuous, 'multi-coloured' and present birdsong; on the other hand, the feeble and discontinuous sounds that come from the inside of the building of the railway station. The latter puts us in the role of sonic 'spy', eavesdropping on the everyday life of a family during their midday meal (i.e. their dishes and television, etc.).

Tags: railway Station; Vaglia Apennins, Italy; birds; television; everyday life

Writer's Suggestions:
When in the recording do you hear the call of a Streptopelia Decaocto (decaoctoura in Greek)? Do you think that the bird is close or far?

Ask someone who knows, or watch the instructions on how to whistle using your hands, and then try to imitate the call of the Streptopelia Decaocto. You might have to try quite a lot, in order to learn how to do it, but don't give up easily!

What is the name of this bird in your native language? The bird name 'decaoto' is an example of onomatopoeia because it sounds like this bird's call. In Greek 'decaoto' means eighteen (deca = ten and octo = eight.) Can you remember some examples of words in your native language that are created from onomatopoeia?

What non-bird sounds can you hear in the recording? When? Can you hear these sounds in the foreground or in the background?

Recording no 62: 'Portrait of a Marine Reserve' ▷

Place of recording: Riserva di Capogallo Palermo, Sicilia
Name of recordist: Giovanni Magaglio / *magaj8@gmail.com*
Date of recording: 26/03/2017, 16:30

Recordist's notes:
In the reserve we find nature pervaded by the sound of the sea. The road is made of stone chippings. The sea, the main sound element, at the beginning of the recording is far to the left, and to the right there is a mountain with trees. Soon the sound of the sea will be closer.
The main sound event is the constant sound of the sea (keynote sound) that pervades the whole acoustic spectrum. (Initially in the distance, then closer). The sound of the sea has a low dynamic at the beginning, then, has a higher dynamic at the end of the recording. You can perceive the sound in its characteristics (water, drops, foam). In the recording we can hear the stone chippings, the sound of a boat that is slowly disappearing and the chirping of birds. One in particular is the Guguştiucul turtledove (Streptopelia decaocto Frivaldszky). Towards the end of the recording the sound of the sea is very close and you also hear the sound of the water inside the rocks (with accentuated low frequencies).

Tags: nature; sea; birds

Writer's Suggestions:
Make a graphic score and mark where in the recording you hear: a) sounds of human speech, b) sounds of human walking, c) sounds of birds (how many different kinds of birds)? Also mark in the score when you can hear the sound of the sea as a background and when as a foreground.

From the sounds of the recording, would you infer that this is a sandy beach or a rocky beach?

From the sounds of the recording, would you infer that the recordist is approaching the ocean or moving away from it? What sound characteristics make you think one way or another?

Recording no 72: 'Portrait of a Serin (Canary)' ▷

Place of recording: La sella del Diavolo, Sant' Elia, Cagliari, Italy
Name of recordist: Simone Faraci
Date of recording: 27/04/2017, 06:30

Recordist's notes:
A European Serinus recording in a low Mediterranean maquis. Other birds such as seagulls and perhaps a nightingale can also be heard. This recording may serve as a portrait of a canary.

Tags: serinus; portraits; bird (canary); Italy

Writer's Suggestions:
How does the canary produce its calls? What is the anatomy and function of its voice producing mechanism? You can read (here >) about an explanation of the Syrinx and the independent sound production of its two sides, which makes it possible for the canary to form its rapid trills.

How do canaries and other songbirds learn their songs? Can they sing them as soon as they hatch?

Related information: they make sounds even before being hatched, but it takes them some time to learn to sing like their parents. Songbirds at the beginning of their life utter a variety of short sounds and their song is not recognizable as a song of their species. In that respect, they are similar to human babies who babble. The birds' babbling stage is called 'sub song'. Later on, birds start stringing some sounds together, imitating small parts of their parents' complete song. Now they are quite like human babies who start imitating single words. This stage in birdsong development is called 'plastic song'. Finally songbirds learn their full adult song called 'crystallized song'! They can sing all the parts of their parents' song and in the right order. This latter stage would correspond to the stage of human language development, when toddlers are able to say whole sentences! You can listen to some examples of 'plastic' and 'crystallized' songs of different birds (here >).

Recording no 74: 'Sella del Diavolo Soundscape' ▷

Place of recording: Sella del Diavolo, Cala Mosca, Cagliari, Italy
Name of recordist: Simone Faraci
Date of recording: 27/04/2017, 08:20

Recordist's notes:
I made this recording on a headland in the Macchia shrubland, facing the bay in a south-westerly direction. Several species of birds can be heard as warblers and seagulls. The panoramic recording is useful as a background.

Tags: natural soundscape; birds; warblers; seagulls

Writer's Suggestions:
In the beginning the birds are heard more in the background. Towards the end is there an alarm call from a bird? If so, from which bird?

What is the *keynote* sound in this soundscape? *(the ocean)*

Recording no 75: 'Facing the Woods in Monte Arcosu' ▷

Place of recording: WWF Oasis of Monte Arcosu, Cagliari, Italy
Name of recordist: Simone Faraci
Date of recording: 28/04/2017, 06:30

Recordist's notes:
The recording took place in a large meadow in front of a forest, with the microphone facing the woods. This is a panoramic recording useful as a background.

Tags: natural soundscape; woods; birds; panoramic recording

Writer's Suggestions:
Can you recognize any of the birds that are heard in this recording? Can you hear one or more Chaffinches, and if so, when? Listen to the song of the Chaffinch here: https://www.british-birdsongs.uk/chaffinch/.

Recording no 76: 'Song of a Coal Tit' ▷

Place of recording: WWF Oasis of Monte Arcosu, Sardinia, Italy
Name of recordist: Simone Faraci
Date of recording: 28/04/2017, 06:50

Recordist's notes:
Recorded at a short distance from the tree from where the bird was singing. This tit's song consists of the repetition of two short phrases; at first fast and high-pitched and then slower and with a lower pitch. The aim was to record the song of the Coal Tit.

Tags: bird song; sound portrait; coal tit; birds

Writer's Suggestions:
Analyse the song of the Coal Tit as heard in the recording, (how does it begin, how does it develop, how does it end?). If it were music, would it have one, two or more different sections? Imitate it with your voice and then try to imitate it with a musical instrument.

Recording no 77: 'Blackbirds in Danger' ▷

Place of recording: WWF Oasis of Monte Arcosu, Sardinia
Name of recordist: Simone Faraci
Date of recording: 28/04/2017, 7:10

Recordist's notes:
Approaching a tree, a couple of blackbirds noticed human presence. At the beginning of the recording, one can hear these signals of the male blackbird, followed by a very high-pitched call by the female. Perhaps the first call denotes annoyance and the second alarm, danger. After a few seconds the male makes a complex and loud call just before flying away. It is possible that he wanted to turn human attention away from his nest. His signal could be heard in the distance for a while. The recording is a good example of showing how human presence or human activity, such as field-recording, can create interactions with the environment. At the same time it shows a typical behaviour of blackbirds.

Tags: blackbirds; blackbirds' calls; birds; bird calls; birds behaviour; alarm call

Writer's Suggestions:
Listen to a song of a male blackbird (here >). How is this song different from the alarm calls heard in the recording?

At what point or points (minutes, seconds) in this recording can you hear alarm calls from the blackbird?

What are the sound characteristics of the two types of alarm call: a) one type of alarm call to threaten the intruder b) another to warn the family about the possibility of approaching danger. Discuss why you think the bird has chosen these different sound characteristics.

Compose music for the following Alarm call song:

Koukitarra, SsSs: Alarm Call Song (I. Etmektsoglou)

Kou ki ta rra Kou ta frri ta Kou pou tay
Go away, right away

Kou ki ta rra Kou ta frri ta Kou pou tang
Don't you dare, we are a gang

Ss Ss Ss Ss
Silence babies, not a sound

Ss Ss Ss Ss
Danger spotted from the ground

Recording no 78: 'Marmora's Warbler song (part 1)' ▷

Place of recording: WWF Oasis of Monte Arcosu, Sardinia
Name of recordist: Simone Faraci
Date of recording: 28/04/2017, 14:12

Recordist's notes:
The recording is centred on a tree by a little stream. A Marmora's Warbler is singing on the tree. The sound of the flowing water. A portrait of the Marmora's warbler.

Tags: marmora's warbler song; bird song; water

Writer's Suggestions:
Read more details about Marmora's Warbler here > (Locustella luscinioides). In what kind of environment does the Marmora's Warbler live? Based on your listening of this recording, do you think that it lives: close to the sea? Close to a lake? Or close to a river? Does its habitat sound like an open space or more like a closed environment? How do you think the Marmora's Warbler's song is influenced by its environment? The Greek name of the bird is: *Kalamotrilistis* (Kalami = reeds & trilistis = one who produces trills). What is the name of the Marmora's Warbler in your country? Does its name give any information about its habitat and about the sounds this bird produces?

Recording no 79: 'Marmora's warbler song (part 2)' ▷

Place of recording: WWF Oasis of Monte Arcosu, Sardinia
Name of recordist: Simone Faraci
Date of recording: 28/04/2017, 14:17

Recordist's notes:
The recording is centred on a tree by a little stream. A Marmora's Warbler is singing on the tree. The sound of the flowing water can be heard along with other birds on the background and the passage of insects. A portrait of the Marmora's warbler.

Tags: Marmora's warbler song; bird song; water; insects

Writer's Suggestions:
Listen to the song and calls of other Marmora's Warblers here: https://dibird.com/species/marmoras-warbler/. Try to describe the main sound characteristics of the song and call of the Marmora's Warbler to someone who has not heard this bird before.

Recording no 81: 'Sant' Efisio procession: popular songs' ▷

Place of recording: *Via Domenico Alberto Azuni, Cagliari*
Name of recordist: Simone Faraci
Date of recording: 01/05/2017, 11:30

Recordist's notes:
Recorded during the Sant' Efisio procession from a balcony above the street. Different songs can be heard along with launeddas players and buzz from the crowd. Recording of the sound of the feast, especially the popular songs.

Tags: anthropophony; traditional feast in Cagliari; popular songs; religious procession

Writer's Suggestions:
What do you observe about the balance between the singing sounds and the other sounds of the crowd? What strategies do the singers use to make their song heard above the sounds of the crowd?

What kinds of instrumental sounds can you hear? How do they interact with the songs?

Compare people's singing in the buzz to the singing of the warblers against the sound of the flowing river. Do you notice any similarities or differences?

How do the sounds heard by the static listener change as the procession moves? What is the effect of distance in the transmission of sound?

Is there a traditional procession in your area? What similarities or differences would you hear in the respective soundscape? Why do you think they might exist?

Recording no 83: 'Sant' Efisio Procession: Launeddas and songs' ▷

Place of recording: Via Domenico Alberto Azuni, Cagliari
Name of recordist: Simone Faraci
Date of recording: 01/05/2017, 13:00

Recordist's notes:
Recorded during the Sant' Efisio procession from a balcony above the street. Different songs can be heard along with launeddas players and the horses' clogs as they walk past. Recording of the sound of the feast especially the popular songs and the launeddas players.

Tags: anthropophony; traditional feast in Cagliari; popular songs; launeddas; traditional instruments; religious procession; horses

Writer's Suggestions:
When can you hear church bells in the recording? What makes it possible for them to be heard, despite the loud sound of the crowd?

Listen to these: launeddas player in Sant'Efisio's Eve 2008 (Sardinia), resource 1 >
Luigi Lai, launeddas recital, resource 2 >
Is there a wind instrument in your country that makes similar sounds?
Does it have two or more river-cane tubes that are played by the same person simultaneously? Is it played in a similar way? Differently? How?
Why do you think such an instrument was developed instead of having two or more people playing together with single tube instruments?

Recording no 84: 'Acoustic portrait of a quiet Mountain' ▷

Place of recording: Caralte di Cadore, Veneto, Belluno City, Italy
Name of recordist: Federico Lassarini / *lazzarini/.treviso@gmail.com*
Date of recording: 07/06/2017, 09:30 AM

Recordist's notes:
The recording was performed using a stereo shotgun microphone in Mid/Side mode (lobar polar diagram for mid and bidirectional for side) and a pair of Omnidirectional DPA capsules (LEFT-RIGHT channels) – 15cm distant (each) from the M/S' Shotgun. The recording was carried out along a canal of drainage water discharged into a forest of larch, fir and mountain cedar; the surrounding environment indicates the presence of an active stream (to the left by the listener, about 15 meters away). There are many varieties of birds present (buzzards, cuckoos and woodpeckers) - the sky is transversed by the sound of an airplane. The frequency extension of the collected material is between 45 Hz and 12 KHz with evident gain between 2 KHz and 8 KHz (birdsong). The recording was carried out in order to make the listener aware of a unique and delicate mountain habitat. So many species of birds have disappeared from these mountains today.

Tags: birds; mountain; Cadore; Italy

Writer's Suggestions:
At which times in the recording do you hear a woodpecker? A Common Chaffinch? (Fringella coelebs).See this resource >

Using the knuckle of your bent middle finger knocking on a wooden surface, try to imitate the sound of the woodpecker call. Try to imitate its timbre and rhythm.

What do you perceive as the *keynote* sound of this recording? *(running water ?)*

Recording no 85: 'The Sound of Light - Night Insect Flight' ▷

Place of recording: Caralte di Cadore, Veneto, Belluno City, Italy
Name of recordist: Federico Lazzarini / *lazzarini.treviso@gmail.com*
Date of recording: 03/03/2016, 23:45 AM

Recordist's notes:
The recording was carried out using a stereo shotgun microphone in Mid/Side mode (lobar polar diagram + bidirectional). The recording was carried out in a dark and isolated location by placing the microphone next to a small light source - irresistible attraction for night bugs. The distortion is due to the close flight of a large moth. The frequency extension of the collected material is between 200 Hz and 20 KHz -of course the useful bandwidth is very limited (2.5KHz to 20 KHz). The recording was carried out to make the listener aware of a unique and delicate mountain habitat. Many species of insects are at risk of extinction from atmospheric pollution and global overheating today.

Tags: Moth; insects; flight; nocturnal; mountains; Cadore; Italy

Writer's Suggestions:
How would you describe the Moth sound in this recording? Can you hear any other sounds? Can you hear any insects moving across space? When in the recording?
Read these: (resource 1 > , resource 2 >) and other related sources and discuss:
a) what are the possible causes for the declining numbers of moths and other insects? b) which causes are attributable to human actions? c) how might the threat of extinction of many species of moths and other insects affect the ecosystems? d) what can we do to contribute to their survival?

Recording no 86: 'Abandoned Lagoon House in Venice' ▷

Place of recording: Cavallino Treporti, Veneto, Venice, Italy
Name of recordist: Federico Lazzarini / *lazzarini.treviso@gmail.com*
Date of recording: 05/08/2015, 04:33 AM

Recordist's notes:
The recording took place in a typical uninhabited lagoon home close to a fishing valley, a farm and vegetable gardens. There is a drainage water-channel, mosquitoes, crickets, roosters, hens, quails, ducks and pigeons. The road in the distance where this place is accessed through, is

revealed by the sound of some passing cars and by an indistinct noise. The frequency range of the collected material is between 95 Hz and 16 KHz - with apparent gain between 600 Hz and 5 KHz (bird songs). The recording was carried out in order to make the listener aware of a unique, delicate lagoon habitat exposed to the continuing risk of territorial disintegration and extinction of flora and fauna.

Tags: lagoon home; Venice; roosters; hens

Writer's Suggestions:
Identify as many sound sources as possible under the following categories:
Anthropophony, Biophony, Geophony (see Krause, 2012 and include sub-categories of Anthropophony and Biophony as proposed by Etmektsoglou):

- Anthropophony [primary]: sounds made with the human body and/or basic material found in the environment,
- Anthropophony [secondary]: sounds produced by man-made artifacts acoustically (i.e. all sorts of machines, acoustic musical instruments etc.)
- Anthropophony [tertiary]: sounds produced by man-made artifacts based on electroacoustic amplification

Make a sound map of the recording.

If every sound-source was an instrument of an orchestra, where would you place it in a musical score? (Instruments with low pitches are placed towards the bottom of the page and instruments with high pitches towards the top). Mark every instrument's possible 'acoustic niche' on the score (see Krause, 1993).
Can you hear many different sound-sources? If so, why?

How many kinds of chicken-sounds can you distinguish in the recording? Imitate them vocally, make a picture of each one and try to find out what each one means. See this: (go to resource) and other sources.

Is this soundscape characterized by masking or transparency of sounds?
Is this soundscape characterized by variety or lack of variety of sounds? What might contribute to this?

Recording no 87: 'Acoustic Portrait of a Lagoon House in Venice' ▷

Place of recording: Cavallino Treporti, Veneto, City of Venice, Italy
Name of recordist: Federico Lazzarini / *lazzarini.treviso@gmail.com*
Date of recording: 07/08/2015, 02:00-06:00 AM

Recordist's notes:
The recording took place in a typical uninhabited lagoon home close to a fishing valley, a farm and vegetable gardens. The long recording time has allowed for the capture of multiple acoustic atmospheres –night birds, lagoon breeze, rain on plastic soles, a thunderstorm, doors and windows shaken by the wind. The main protagonists of the recording are chicks, roosters, chickens, quails and pigeons. The frequency range of the material is between 40Hz and 18KHz, with apparent gain between 600 Hz and 6 KHz (bird's song). The recording was carried out in order to make the

listener aware of a unique, delicate lagoon habitat exposed to the continuing risk of territorial disintegration and extinction of flora and fauna.

Tags: lagoon; Venice

Writer's Suggestions:
When can you hear sounds of anthropophony and when sounds of geophony in this recording? What is the source and the sonic characteristics of each of these sounds?

Can you hear a change in the keynote sound? If so, where in the recording? What information does this change give you?

Can people understand the sounds of chickens? If so, why could this be useful? (You can watch this here >).

Recording no 88: 'Light Cages - Acoustic portrait' ▷

Place of recording: Cavallino Treporti, Veneto, City of Venice, Italy
Name of recordist: Federico Lazzarini / *lazzarini.treviso@gmail.com*
Date of recording: 07/08/2016, 13:00 AM

Recordist's notes:
The recording was carried out within a complex network of cages containing birds of all kinds: prevailing is the common canary bird. The only human presence, represented by the bell's sound, unleashes the birds' singing. The frequency range of the material is between 650 Hz and 20 KHz. The aim of the recording is to make the listener aware of a unique, delicate lagoon habitat exposed to the continuing risk of territorial disintegration and extinction of flora and fauna.

Tags: canary; caged birds; lagoon habitat; endangered habitat; Italy

Writer's Suggestions:
How does the Canary produce fast trills in its song and how useful can these be for a male Canary? (You may see here >).

Watch this video > about playing trills on the recorder. If any members of your group play musical instruments, ask them to demonstrate how they play trills and listen to the distinctive sound. Experiment musically with trills on musical instruments.

Discuss the customary practice of keeping birds in cages. What do you think about this practice in our society today?

Recording no 108: 'Recording of Sea Water, between Blocks of Cement' ▷

Place of recording: Lighthouse of Figueira da Foz Av. 25de Abril, Portugal
Name of recordist: Luís Antero / *fonoantero@gmail.com*
Date of recording: 10/09/2017, 15:00

Recordist's notes:
In a soundwalk from the wall to the Lighthouse of Figueira da Foz, where dozens of fishermen spend their free time at the end of the week, I placed the recorder in the middle of two large concrete stones that are along the wall. I noticed that the sound of the water, when in contact with these large blocks, produced a unique sound with very interesting acoustic dynamics. In addition to the sound of the water in contact with the rock, we can still hear, if we listen attentively, the sound of the engine of some fishing and recreational boats that were circulating on the opposite side from where the recording was taking place. We can record the sound of the sea water in various ways and from various locations. In this recording, I was interested in the acoustic dynamics of the water in contact with the large concrete blocks that were along the wall of the Lighthouse of Figueira da Foz and the engines of some fishing and recreational boats that were circulating on the opposite side from where the recorder was placed. The inclusion of the latter sounds in this landscape not only does it reinforce the dynamics, but also, symbolically, the connection of people from the city to the sea.

Tags: field recording; soundscape; water recording; sea

Writer's Suggestions:
Listen to the recording before reading any information about it. Try to describe the space, the sound of the water and the kind of material the water hits onto.

Mark the times in the recording when you can hear sounds other than waves. What are these sounds? What is the effect of the sounds of waves on them? Discuss the phenomenon of masking.

Are the sounds of these waves in the foreground or the background of the soundscape as you listen?

Experiment with ocean drums or large plastic washing tubs with small stones, sand, lentils, rice or other small objects in them, which you move around so that you can recreate the soundscape of the recording. How fast or slow do the waves crash? Which of the objects you experimented with is more similar to the real sound of waves-crashing, as heard in this recording?

Recording no 127: 'Omonia Metro Station Hall' ▷

Place of recording: Omonia square, Athens, Greece
Name of recordist: Stellios Giannoulakis
Date of recording: 10/01/2018, 11:30

Recordist's notes:
Athens, the underground station of Omonia. Many people are walking to and from platforms. I'm standing next to the barriers, where two lottery vendors are located. Another street vendor sells bird-whistles and endlessly makes whistling sounds. I cross the barriers and stand in front of the ticket machines where people are talking all together. I then go onto the escalator and head out towards the square. A very rich sound scene, both from a sonic and cultural point of view. It is a snapshot of daily life in Athens, in the late morning hours in one of the busiest metro stations of the city centre. Taking ordinary daily events out of their natural context and focusing on certain details creates interesting mental imagery, an almost surreal soundscape. The material has not been edited; the Athenian soundscape is very interesting. Near the platforms, and more specifically

over them, there is a bass drone that changes whilst moving towards the exit and is finally replaced by the noise of the city. The sounds change as we go up the escalator. When outside, the sound of a passing motorbike becomes quite evident. In this short soundwalk there are at least four major sub-plots occurring; the soundscape in a big city is a fractal made of individual stories.

Tags: urban soundscape; vendors; ticket machines; metro station; Omonia square; Athens; Greece

Writer's Suggestions:
Do you notice any differences between the closed (inside the metro station) and open (outside the metro station) acoustic space? If so, what makes you distinguish the former from the latter?

Would you expect to hear the sounds of birds inside the metro station? Was it a surprise for you? What did you think when you first heard the bird sounds? Did you realize that the sounds were generated by a bird-whistle or did you think that there was a real bird?
Why do you think that the vendor decided to sell his bird whistles inside the metro station?

How many different sounds can you hear in the recording? Put them in the categories of anthropophony, biophony and geophony.

Recording no 128: 'Votanikos Street Bikes' ▷

Place of recording: Votanikos, Athens, Greece
Name of recordist: Stelios Giannoulakis
Date of recording: 8/01/2018, 10:00

Recordist's notes:
Sounds were occurring whilst slowly walking around some side streets of Votanikos and standing in various places for a while. Two air-conditioning units, motorbikes and a motorbike garage. A snapshot of daily life in Athens; morning hours in a neighbourhood close to the city centre. Multi-layered sonic activity and dramatic changes of focus.

Tags: urban soundscape; Votanikos; side streets; motorbikes; Athens

Writer's Suggestions:
Describe the sound of a motorbike driving past you. Analyse the sound event of the passing motorbike in the recording (from 0'32'' to 0'43''). Produce a graphic score and try to reproduce this sound of a motorbike passing next to the listener, using vocal sounds.

Describe what you heard from 2'22'' to 2'57''. Which sound sources do you identify? What is the most prevalent musical element in this section?

Recording no 129: 'Bus Ride to Monastiraki' ▷

Place of recording: Bus route to Monastiraki Square, Athens, Greece
Name of recordist: Stelios Giannoulakis

Date of recording: 8/01/2018, 10:30

Recordist's notes:
On the 025 bus to Monastiraki Square, there is a sonic scene dominated by the fluctuating drone of the engine. One can hear the car rattling as it starts and stops or is driven over road bumps; announcements of stations and some small talk in the background are also heard. Hypnotic soundscape, laced with hard rapid changes, both in the foreground and background. The elongated glissando drones from the engine create the perfect background for the rattling metal and glass sounds.

Tags: urban soundscape; bus ride; Athens; Greece

Writer's Suggestions:
Identify four kinds of different sounds and describe each one of them.
Possible answer: 1. the recorded, amplified voice that announces the stops clearly, 2. the masked drone of the engine which sounds like wind and makes ascending and descending glissandi, 3. very high, thin sounds perhaps from the breaks and 4. medium-high, arrhythmical percussive sounds, like shaking metal objects.

Work in a group of 4-8 people, choose objects or musical instruments and try to collectively reproduce the bus ride.

Recording no 130: 'At Victoria Station' ▷

Place of recording: At the platform of Victoria metro station, Athens, Greece
Name of recordist: Stelios Giannoulakis
Date of recording: 8/01/2018, 9:30

Recordist's notes:
Standing on the platform, a train arrives, stays for a while, then departs. As more people come to the station I take the escalator to the street. A very dramatic recording with the metro trains coming and going. Amplified by the tunnels, the sound is very rich; one can hear the wind moved by the train at least 30 seconds before it turns up. The ambiance of the station before and after the sound of the wind and the sound of the train; gradually filled by bass and saturated by the sound of the breaks and the sharp percussive sound of the doors. Finally, the sound of the escalator leads to the street above, where everything sounds very different.

Tags: urban soundscape; metro train; underground station; Athens; Greece

Writer's Suggestions:
Listen to the first 20 seconds of the recording and answer the following question: Is the listener standing on the platform of a bus station outdoors or on a platform of a metro station indoors? What sound information influenced your answer?

During what time intervals (in minutes and seconds) in the recording do the sounds of the metro mask the human voices?

When in the recording can you hear a change of space from indoors to outdoors?

How does this particular urban soundscape differ from a similar soundscape in the town where you live?

Recording No 131: 'Patision Street Traffic' ▷

Place of recording: A street in Athens, Greece
Name of recordist: Stelios Giannoulakis
Date of recording: 8/01/2018, 13:30

Recordist's notes:
Standing at the intersection of Patision and Stournari Str. in Athens, on the central traffic island, then walking along Patision Str. A noisy recording full of cars, buses and motorbikes, in one of the busiest spots in Athens. Quite brutal sonic changes in a canvas filled with noise. Beautiful and relentless, not for the 'faint hearted', something that everybody at the centre of Athens hears everyday - perhaps not so attentively...

Tags: traffic; vehicles; urban soundscape; Athens; Greece

Writer's Suggestions:
Listen carefully and mark four distinct times on the recording that you can hear a car or motorcycle horn (0'06'', 1'27'', 2'09'', 2'41'').

What is the sound heard at 3'06''? How does it differ from similar sounds in this recording? (sounds like a horn but it is not abrupt, staccato, short, but rather long and more melodic, moving back and forth in a half step, like a short segment of an ambulance horn).

Can you hear a street vendor in this recording? If you don't know the Greek language, what makes you think that it is a street vendor?
(at about 2'00'', repetition of a short speech passage, rhythmic pattern, melodic inflection, loudness).

Describe the relationship between the human voice and traffic sounds in this recording. Which predominates and masks the other? Find a point in the recording that you cannot hear the masked sounds at all. Discuss the size of a listener's acoustic horizon in such a busy street of downtown Athens.

Identify the sound sources in this recording and classify them under the following categories by Krause (2012): Anthro[po]phony-Biophony-Geophony

Locate a busy street in your city/town and measure the sound pressure level, using a decibel meter. If you do not have one, you could download one for free on a mobile phone.

Recording No 132: 'Monastiraki Walk' ▷

Place of recording: Monastiraki, Athens, Greece

Name of recordist: Stelios Giannoulakis
Date of recording: 8/01/2018, 14:00

Recordist's notes:
This is an urban soundscape. Walking around the Monastiraki flea market and square during busy hours. The pedestrianized area is dense. Various shops, lots of people, someone sawing a wooden board. Various bits of random talking all around, bikes, trolleys, music. Many layers of sound in this very complex sound scene, as we move from event to event. A snapshot of an urban soundscape, through the ears of someone walking around the busy area in Athens.

Tags: urban soundscape; Monastiraki Square; pedestrian area; Athens; Greece

Writer's Suggestions:
When in the recording can you hear for the first time the sound of a hand saw cutting wood ? Go back to the recording and try to listen to the first instance that this particular sound becomes audible (around 0'30''). Listen to the sound event of the hand saw, from the beginning to its end, several times. Make a drawing of it to show how it enters the soundscape, how it develops and how it disappears. Select a segment of the recording where the saw is not heard and use it as background, against which you will reproduce the saw sound event as foreground, using mouth/body percussion or with a help of a percussion instrument (professional or hand made).

When in the recording can you hear music as background or foreground?

Compare the acoustic horizon in this recording to the *'Patision_Street_Traffic'* recording. In which recording is the acoustic horizon more or less broad, expanded? Discuss the possible reasons for this difference and the possible effects of a smaller acoustic horizon on the activities and health of humans and other animals.

How many different languages can you distinguish? Can you identify them?

Recording No 133: 'Cars and Pigeons' ▷

Place of recording: Lycabetus Hill, Athens, Greece
Name of recordist: Stelios Giannoulakis
Date of recording: 17/01/2018, 13:00

Recordist's notes:
Walking on the pavement of a street in Athens. Cars drive past on this narrow street coming down from Lycabetus hill in Athens. Pigeons pick seeds off the pavement and as they are disturbed fly up but come back again after a few seconds. Very interesting spatial information, as the cars drive past and the birds fly around. A synthesis of biological and mechanical sounds in a city scene.

Tags: urban soundscape; pigeons; cars; Athens; Greece

Writer's Suggestions:
When is the first moment in the recording that you hear a bird chirping sound? (around 0'23'') When do you first hear sounds of birds' wings? (0'32'') When do these sounds disappear? (1'04'')

Make a drawing of the sound event of birds' flying. How does it enter the soundscape? Gradually or rather abruptly? How does it develop in time? Why does it disappear?
Using your drawing of pigeon's flying sounds from this recording as a reminder, attempt to imitate this sound gesture, experimenting with a variety of musical instruments.

Discuss the issue of sound pollution in cities due to traffic, and its possible effects on birds and other animals. (see this >). Does traffic noise affect humans as well, directly or indirectly?

Recording No 134: 'Urban soundscape from above' ▷

Place of recording: a balcony in Victoria, Athens, Greece
Name of recordist: Stelios Giannoulakis
Date of recording: 15/04/2017, 17:00

Recordist's notes:
The balcony is on the 6th floor of a block of flats located between two very busy streets, Patision and Tritis Septemvriou. The sound of Athens is captured in the recording from above. There is a mingling of all the sounds that happen in an area of approximately four blocks, captured by a mic with high sensitivity, placed vertically. There is a thick pool of indiscernible sounds and it is interesting to hear as sounds appear and disappear in the mix, some sounds being more prominent than others. Hypnotic and drone driven, almost 'addictive'. Also, the sources seem to be located much closer than they really are, so we get a strange sense of proximity to the heart of this noisy scene, something that is of course an illusion: what we hear are two major streets from the top of a building.

Tags: urban soundscape; traffic; balcony; cars; Athens; Greece

Writer's Suggestions:
Locate the time that you first clearly distinguish a bird chirping in the recording. (1'04'').

Compare the recording of a busy street in Athens from ground level (i.e. Recording No 131: *Patision Street Traffic*) to the present recording from the sixth floor of a building in a similar area. What differences do you notice? Focus on the comparison of the two soundscapes as a whole but also on the comparison of particular sounds such as the sounds of motorcycles, of cars, buses, the voices of people and bird sounds.

Discuss the effects of other buildings, the effects of distance, the characteristic of low frequency sounds travelling farther than the high frequency sounds (especially apparent in the loss of 'crispness' of the sound of motorcycles when we hear them from far away).

How is it possible that we can still hear the chirping of some birds at some points in the recording, despite the heavy sound of traffic? Discuss the niche hypothesis and the distribution of sounds on the spectrum, as well as why many birds choose high places, such as tall trees, from where to sing for better communication with their conspecifics.

About half a century back, many apartment buildings in downtown Athens had balconies and people used to spend time there relaxing, especially during the evening hours of the summer. The balcony used to be like a summer 'living room' for people living in the city. Based on your

listening of the present recording, discuss how traffic noise has changed the everyday living conditions of city people. Do you have a similar problem in the place where you live? If so, describe it. If you don't, still describe the sonic conditions for people living in the centre of your village, town or city.

Recording No 135: 'Athens 6th Floor' ▷

Place of recording: a balcony in Victoria, Athens, Greece
Name of recordist: Stelios Giannoulakis
Date of recording: 15/04/2017, 18:00

Recordist's notes:
The balcony is on the 6th floor of a block of flats, which is located between two very busy streets, Patision and Tritis Septemvriou. The sound of Athens is captured in the recording from above. There is traffic from two major streets and the rest of the city noise is integrated into a dense drone - texture, as it is captured with a mic with high sensitivity from far on the vertical axis. This time the dominating sound is of a very loud motorbike with an obnoxious driver drawing a large sonic gesture, way above the threshold of the city noise. In this recording traffic is heavier and louder than in the first Athens_6th floor recording, about an hour earlier.

Tags: Urban Soundscape; traffic; motorbike; balcony; cars; Athens; Greece

Writer's Suggestions:
When in the recording do you distinguish the single motorcycle sound? (1'40'', 1'52'')
Try to reproduce it vocally. Is it very prominent in the soundscape or not? Why do you think so?

Recording No 137: 'Goumenissa Session, Lisavo' ▷

Place of recording: Goumenissa, Greece
Name of recordist: Vassilis Roupas / *vroupas@gmail.com*
Date of recording: n.d.

Recordist's notes:
This is the second part of a session. The recording took place in a kitchen/living room (single room) without a lot of furniture. There was a couch and a plastic table on which I placed the microphones). Since the room was essentially empty, the reverberation and diffusion of the sound made the recording more enjoyable. The players are three musicians from the local ensemble called 'The Brass of Goumenissa': Grigoris Digas (trumpet), Alexandros Digas (clarinet) and Traianos Digas (percussion 'daouli'). The piece is entitled 'Lisavo' (which is a girl's name) and is part of the Slavomacedonian tradition.

Tags: brass instruments; Goumenissa Greece; trumpet; clarinet; daouli; reverberation

Writer's Suggestions:
When in the recording can you hear the trumpet and the clarinet as one instrument and when as two instruments, independent of each other?

While listening to the recording, do you suppose that the band played in a relatively small room with quite a lot of reverberation, in an open space, or in a large concert hall? Why do you think so?

Recording No 139: 'Kythera: Waves on Pebbles' ▷

Place of recording: Kythera, Greece
Name of recordist: Vassilis Roupas / *vroupas@gmail.com*
Date of recording: n.d.

Recordist's notes:
The beach is called 'limni' (lake) because it is usually calm and its water is brackish due to a small river, which flows into it. The recording took place late in the afternoon, so there were not many people bathing at that time. This is actually a 'secret' beach since it is not visible from the road and in order to reach it one has to pass through the riverbed. The recording was made in a squatting position with the recorder handheld. I was interested in recording the pebbles, not the waves. That is, the sound they make as the wave breaks on them and moves them as it pulls back. It is a cascading effect. One can even hear the sound of the foam if one listens carefully! So this is an example of a sound with levels. On the first level one hears the wave, on the second level one hears the pebbles, and on the third level one hears the foam. Another point of interest is that, although the recording is static, in the end it is transformed into a dynamic one as I stand up and move away from the wave. With the recorder pointing down, we hear the steps on the pebbles as the sound of the sea fades away. Interesting to examine: How many sounds are in a sound? How a static recording is transformed into dynamic?

Tags: nature sounds; waves on pebbles; foam; static recording; dynamic recording

Writer's Suggestions:
While listening to the recording, do you infer that this is a sandy beach, a beach with large stones, with small pebbles, or with medium to large pebbles? Is it a day with almost no wind, with medium, or strong wind?

Recording No 140: 'Athens Session: Green Parrot' ▷

Place of recording: The balcony at my house, Halandri suburb, Athens, Greece
Name of recordist: Vassilis Roupas / *vroupas@gmail.com*
Date of recording: 24/9/2017, 18:35

Recordist's notes:
Recording green parrots is not an easy task, since they prefer to sit on tall trees and do not stay at the same place for long. They usually fly in groups, shouting, but they are too fast to be recorded. This particular parrot used to stop and sit on a power line outside my balcony every afternoon, at the time when the birds are gathering together. I noted the time and the next afternoon, I placed the recorder and started recording 10 minutes before it arrived. The distance was approximately 10 meters (my apartment is on the second floor, so the microphones were almost in a straight line

from the bird), which means that the background was also recorded (cars and pedestrians passing by and talking). I had to do some processing in the computer in order to lower the background noise and make the parrot's voice stand-out better.
Halandri, an Athens suburb with many trees and a small river, which crosses it as it descends from mount Penteli, has rich flora and fauna. In recent years, exotic birds like green parrots and hoopoes have appeared, offering great pleasure to the citizens who were not accustomed to seeing them in front of their eyes. Green parrots are noisy and have enriched the soundscape with their acute sounds. A few years ago, apart from the ubiquitous collared doves, one could mainly hear sounds from magpies and blackbirds. Today, however, the green parrots are dominant. This maybe due to climate change (sudden temperature changes, extreme weather conditions, etc.) which favours the survival of such species. The green parrot has become a soundmark of the 'soundscape I live in' and my intention was to include its sound in this collection. What do we hear in this recording? We hear a green parrot in the afternoon, during sunset, making a stop on a power line (as it does every day at this hour) and calling in order to be heard by the other parrots in the area. At approximately 2'05'' of the recording the bird receives an answer from another parrot further away and after a while flies to meet him//her.

Tags: Natural sound; bird calls; green parrot

Writer's Suggestions:
Discuss possible changes in the soundscape in correspondence with changes in the ecosystems. A new bird in the area is perceived as a new protagonist by the recordist. Discuss balances, imbalances, dominant sounds and dying sounds in a suburban soundscape of Athens.

Recording No 141: 'Axioupolis Session: Spinus' ▷

Place of recording: Axioupolis, Kilkis (Northern Greece), at the edge of the town, at the foot of Paiko mountain, beside the road.
Name of recordist: Vassilis Roupas / *vroupas@gmail.com*
Date of recording: 23/8/2017, 19:00

Recordist's notes:
This is an improvised recording, in the sense that as I was walking I heard the bird, I took the recorder out of my bag and recorded it. Since it was not planned, the recording contained many unwanted sounds, like the zipper of my bag, the sound of the recorder's button, the camera's clicks, which I removed afterwards in my computer. In an improvised field recording, the sound engineer should always be alert because at any time he might hear something interesting and should be able to quickly activate his/hers equipment. I always have the necessary gear in my bag for such cases: a recorder with a windshield and a photographic camera to document the recording. Recording should begin no more than 10 seconds after the initial identification of the sound, otherwise the moment may be lost. European Siskin is a common type of bird in Greece, with a nice song. It shows familiarity with humans and their activities. This is evident in the recording, as it does not stop its song when I appear nor when vehicles are passing on the road nearby.

Tags: birdsong; European Siskin song; improvised recording

Writer's Suggestions:
Make a sound map with the different sounds of the recording as they unfold in time. Mark loud sounds with darker and thicker lines and soft sounds with light-thin lines. What other birds can you identify? (decaocto?) Find out other kinds of sounds by Spinus. You can listen here >

Recording No 142: 'Athens Session: meat Market' ▷

Place of recording: Athens central meat market
Name of recordist: Vassilis Roupas / *vroupas@gmail.com*
Date of recording: 25/11/2017 – 12:00

Recordist's notes:
I walked through the market with the recorder in front of me, turning it left or right in order to capture interesting sounds. The central market of Athens is housed in a high-ceiling gallery of a T shape. I tried to capture its atmosphere, with the butchers loudly promoting their merchandise, possible buyers examining parts of the meat, people passing-by, even hasty ones entering on their motorbikes. It is an example of a dynamic recording, with the recorder moving forward and left-right in order to take interesting shots.

Tags: voices of people; meat market Athens, Greece; dynamic recording

Writer's Suggestions:
Is this an open-air market or an indoor market? How soon can you decide this? What are your clues?

Make a list of the kinds of sounds that are heard in the recording.

Recording No 143: 'Athens Session: Blackbird' ▷

Place of recording: Athens, Halandri town, at the ravine coming down from Prophet Elias' church
Name of recordist: Vassilis Roupas / *vroupas@gmail.com*
Date of recording: 11/3/2018, 13:30

Recordist's notes:
The bird was hiding in the foliage and could not be seen, only heard. After some effort I managed to spot it and took some pictures. However, it also spotted me and stopped its song. I had to move away and wait for a few minutes until it started again. In the meantime, I prepared the recorder and was able to record from safe distance (approx. 3-4 meters). The blackbird (Turdus merula) is a common bird at the ravine of Halandri town and appears mainly in the spring. When we hear its beautiful song we know that spring has come. The ravine is an idyllic place for a walk. Coming down from the Prophet Elias' church we find a plateau with very high eucalyptus and pine trees, and in the middle a little stream above which there is a metallic bridge. Many people come down to take a walk in the weekends, have a picnic, bring their dogs, etc. And of course there are many birds like green parrots, magpies, doves, blackbirds, spinus, etc. It is a small heaven in the middle of the city and an example of a harmonic coexistence of people and other species in a shared natural habitat.

Tags: natural sound; birdsong; blackbird; ravine, Halandri, Greece
Writer's Suggestions:
Do you also have a small 'paradise' in the centre of your town/city? If so, describe it. In what aspects is it similar or different to the one of the recording?

Is the blackbird also a migratory bird in your area? If so, when does it arrive?

Would you guess that the bird sound heard in this recording, based on its characteristics, is an alarm call, a territorial song, a mating song, or a call of some other kind?

Recording No 144: 'Sails in the Marina on a Windy Day, Greece' ▷

Place of recording: 'Plateia Nerou' (Water Square), Faliro, Athens, Greece
Name of recordist: Philippos Theocharidis / *ptheohar@ionio.gr*
Date of recording: 3/02/2018, 18:30

Recordist's notes:
The recording is static although the mic is handheld instead of being mounted on a stand. Even though a 'dead cat' was used, further processing was needed due to excessive wind noise and rumble (De-Wind and High Pass Filter @ 100Hz - in Izotope RX 6). The aim of the recording is to capture the soundscape produced from the spars and ropes of sailing boats docked in the marina of Faliro, Athens on a windy afternoon. A constant drone from the nearby highway can be heard in the background as well as other sparse sounds of human activity and whistling sounds from the wind. Of interest are the various random granular and rhythmic patterns arising out of the many metallic parts of the sails hitting the spars and the crackling ropes in a wide stereo field.

Tags: sailing boats; spars; ropes; wind

Writer's Suggestions:
What do you perceive as the keynote sound of this recording? How many kinds of sounds do you identify and how would you describe each one? What kinds of instruments or found objects would you use if you were to reproduce the soundscape?

Compare this soundscape with one created by a herd of sheep or goats climbing a rocky area of a small hill, with a river running lower down at some distance. Describe this ecosystem's characteristics, the season, the time of day and other information, relevant for the sounds produced there.

Would you categorize the sounds of the wind hitting different parts of the sailing boats as: geophony or anthropophony? Why? How different would the soundscape of this square be if there were no sailing boats docked there?

Recording No 145: 'City-forest border on an early rainy morning' ▷

Place of recording: Filopappou hill, ring road Athens, Greece

Name of recordist: Philippos Theocharidis / *ptheohar@ionio.gr*
Date of recording: 16/02/2018, 05:30

Recordist's notes
The recording is static and takes place from the balcony of my flat occurring early in the morning on a rainy night before dawn. The mic is aimed towards the hill. A rainy soundscape just before dawn on the border between the city and one of the biggest city parks in Athens. Its main characteristics are the sound of direct rain and water from pipes on the road, on parked cars etc., a bird in dialogue with other birds from the nearby hill and a cat (more prominent at ~3'). The first sparse cars from early city traffic appear at around 2'50'' and 3'10''.

Tags: rain; birds; cats; cars; city-forest borders

Writer's Suggestions:
When in the recording do you hear the cat?
When in the recording do you hear single cars passing?
What do you perceive as the sounds of the background: the rain, or the bird calls?
What is the species of the bird calling? What do you think is the purpose of its calling, given the time of the day and the sound characteristics of its song?

Recording No 146: 'Steni Evia, Greece, Panorama' ▷

Place of recording: Hill above Steni village, Evia, Greece
Name of recordist: Philippos Theocharidis / *ptheohar@ionio.gr*
Date of recording: 24/03/2018, 17:00

Recordist's notes:
The recording is static from a forest above the mountain village of Steni in Evia, Greece, taking place early in the morning on a rainy night before dawn. The mic is aimed towards the hill, the mic facing the village. A high pass filter at 100 Hz is used in order to remove wind noise. A panoramic soundscape of the village Steni in Evia from the hill above. Characteristic is the contrast between close sounds from the forest (mainly birds) and village sounds further away (street vendor having music played by a loudspeaker on top of his car, dogs barking, cocks, chainsaw, bells, between 2'-2' 48''). Dogs and other animals react to the sound of the latter.

Tags: birds; dogs; bells; street vendor; biological-human activity sound; church bells

Writer's Suggestions:
When in the recording do you hear a bird's alarm call?

Make a sound map and include all the sound sources you perceive, as they occur in time, marking them on a sheet of paper from left to right.

Are there any sounds produced as a response to other sounds or presences? Which ones? When in the recording?

Is the sound of the vendor's voice, natural or amplified? What is your experience regarding vendor's voices in your area? Can you imitate the voice of a vendor and the product they try to sell?

Is there a *keynote* sound in this recorded soundscape? Which?

Does the size of the acoustic horizon (see Truax, 1999) change from the beginning to the end of the recording? If so, how and why?

What are the anthropogenic [anthropophony primary, secondary, tertiary, see the author's suggestions from the recording no 86)] sounds that you can identify on the recording and what is their effect on the soundscape?

Do you identify instances of schizophonia? What does this term mean and where does it occur in the recording?

Recording no 147: 'A Walk in Monastiraki' ▷

Place of recording: Monastiraki, Athens, Greece
Name of recordist: Philippos Theocharidis / *ptheohar@ionio.gr*
Date of recording: 12/02/2018, 18:00

Recordist's notes:
The recordist is moving at a slow walking pace. The microphone is placed at the height of the chest and always facing ahead. Walking softly is a way to minimize the sound caused by the steps, however, the soundscape is filled with sounds from people passing by. Small bits have been edited out from the original ~ 8' 30'' recording.
A Friday afternoon walk in one of the most touristic areas of Athens with restaurants, cafés, a flea market and lots of people. The walk takes place on three pedestrian streets ending at Monastiraki square.
a) Adrianou St. (up to ~ 2'): On the left side of the street there are restaurants and cafés and on the right side there is the archaeological site of the Ancient Agora (market) with the electric railway lines in between. A train passes from around 0' 28" until 0' 38". It is interesting to hear isolated words and phrases of people passing by which are mixing with those of people approaching. b) Kinetou St. (~ 2'-2' 53''): A narrow and relatively quiet street joining the two main streets of the area where sounds from kitchens at the back of restaurants can be heard. c) Ifaistou St. (~ 2' 53''-6' 40'', , see picture >): Busy street with clothing and other shops - each with its own music. d) Monastiraki square (~ 6'40''- end): A group of African street percussionists dominates the soundscape at the time of arrival while walking towards them.

Tags: tourist places; shops with music; passers-by speaking; street music

Writer's Suggestions:
When in the recording do you hear music? Can you identify any styles of music? Do the kinds of music you hear give you any information about the possible place of the recording? Is this information confusing at any time? Why?
Talk about globalization, people travelling and the effects of media as parameters of disassociation between music and the places in which it was originally created.

What is the effect of distance on the loudness of sound? To what extent do sounds lose their energy because of distance from the source of the sound? Discuss this in connection with the volume of the voices of people who pass close to the mic and move away as they keep walking.
Here is a presentation of this phenomenon >.
and here an example of transmission loss in relation to distance:
Range, r: 1 meter Relative Intensity l = 1 Transmission loss TL 0 dB
Range, r: 10 meter Relative Intensity l = 1/100 Transmission loss TL 20 dB
Range, r: 100 meter Relative Intensity l = 1/10,000 Transmission loss TL 40 dB

Also take into consideration other parameters, such as masking, and try to explain the way the soundscape changes in intensity and balance based on its moving sources.

Recording no 148: 'At the market' ▷

Place of recording: Varvakeios Agora, Athens, Greece
Name of recordist: Philippos Theocharidis / *ptheohar@ionio.gr*
Date of recording: 17/02/2018, 19:20

Recordist's notes:
The recordist is moving at a slow walking speed. The microphone is placed at the height of the chest and always facing ahead. Walking softly is a way to minimize the sound coming from the steps. The recording is an anthropogenic soundscape (moving observer) and takes place during a walk at the central fish market of Athens at around closing time. The walk starts at the market entrance on the street, where workers are loading a truck and cursing each other. The acoustics change in the sheltered part of the market. At this time most of the customers are gone, some merchants are still selling their goods but most of them are packing up their stalls. At the exit workers are still on the job.

Tags: market; acoustics; talking; cursing; working space; social space (large closed space); Athens; Greece

Writer's Suggestions:
Describe the characteristics of the space of the recording: Is it an open-space, or a closed-space market? Is it large or small? Why do you think so?

Discuss reverberation as a sonic characteristic of spaces. How does reverberation affect the comprehensibility of speech?
How reverberant is your classroom? Do you find it difficult to understand the words of your teacher? If so, what could you do to reduce the reverberation of your classroom? You may research in order to find inexpensive, do-it-yourself suggestions for its acoustic improvement. If the problem is serious, you could write a letter to your school's administration pointing to the need for acoustic improvements in your class or school, which should be conducted by specialists.

Recording no 149: 'Commuting by metro' ▷

Place of recording: Metaxourgio to Omonia Stations by Metro, Athens, Greece
Name of recordist: Philippos Theocharidis / *ptheohar@ionio.gr*
Date of recording: 17/02/ 2018, 15:10

Recordist's notes:
The recording is generally static apart from the 2-3 steps taken in order to get onto the train. The mic is vertical when on the platform outside of the train, and parallel when on the train, always at chest height. Waiting at the train platform of Metaxourgeio station in Athens metro, at a time of the day that it was quiet. Two trains arrive from both directions almost simultaneously. The soundscape changes as I step onto the train, from the wide space and bare walls of the platforms to the closed space with people talking. As the train approaches the next stop (Omonia) a beggar passes by (~2' 20'' - this is quite typical especially around this specific station). I step off the train and the train from the opposite direction is already there. Again the two trains depart almost simultaneously.

Tags: Metro; people talking; open / closed spaces; Athens metro; Greece

Writer's Suggestions:
Suppose that what you listened from the recording was a musical composition. Attempt to analyse it and describe its form. How does it begin, how does it develop, how does it end? What major sections-episodes would you identify? Why?

Now focus your listening on the sound event of the approaching metro (towards the beginning of the recording) from the time you first hear it coming until it stops. What is the morphology of this sound event? How does it begin, how does it develop and how does it end? What different sound components do you perceive in this sound event?

If you have travelled by bus and metro, how would you describe the differences of the sonic experiences of the two kinds of trips? Make two columns on a piece of paper and describe the contrasting characteristics under the headings: *Bus Ride* (one column) and *Metro Ride* (other column). Make the comparison begin when waiting at the bus platform or at the metro platform for the vehicle to arrive.

For the non-Greek listeners, if you have experienced taking the metro in your city or another city of the world, do you identify any similarities or differences?

Recording no 150: 'Waves splashing' ▷

Place of recording: Marina of Patras, Greece
Name of recordist: Philippos Theocharidis / *ptheohar@ionio.gr*
Date of recording: 23/02/2018, 22:00

Recordist's notes:
The recording is static whilst sitting on top of a rock by the sea at the marina of Patras, Greece. A high pass filter at 100 Hz is used in order to remove extra wind noise. The main point of interest in this recording is the various micro-sounds that come from the splashing of the waves on the rocks and the various small caves and cavities created between them.

Tags: splashing waves; geological origin sounds; Patras; Greece

Writer's Suggestions:
What kinds of land features co-create these water sounds? Describe the material the water splashes upon, the possible spaces of resonance, the type of energy (wind) that makes the water move and creates the air bubbles which then break, producing sound. Research the phenomenon of cavitation. You can read here > about cavitation caused by animals, its uses and consequences in the sonic environment (i.e. Snapping Shrimp) as well as the anthropogenic causes of cavitation and its effects.

How many different water-related sounds can you distinguish in this recording? Can you describe them using onomatopoeia? (i.e. Bloopbloprss...). Try to reproduce them with body percussion and mouth sounds.

Recording no 152: 'Change of the Year (2017 to 2018) Celebrations as heard from Sinarades' hill in Corfu' ▷

Place of recording: The hill SE of Sinarades Corfu [coordinates39.584427,19.851379]
Name of recordist: *Andreas Mniestris / andreas@ionio.gr*
Date of recording: 1/1/2018, 00:00

Recordist's notes:
The recording aims to capture the soundscape perceived from the top of a hill (overlooking a very large area including many villages and at the far end Corfu Town during the change of the year (2017 to 2018). Due to the particularity of this moment I wanted to capture the sound coming from all directions and I have used the SOUNDFIELD microphone taking the 4 unprocessed B-channels.
The change of the year in Corfu starts with the sounds of firecrackers, gunshots (hunting guns) church bells etc. In Corfu Town one of the two spectacular firework shows of the year are hosted for about 10 to 15 minutes (the other one being at Easter). I wanted to capture this rare crackling noisy soundscape created by the sounds coming from a large number of villages scattered around the valley panoramically, so I placed the microphone on top of a hill overlooking a large area of this valley bellow, reaching to the north east of Corfu Town. Contrary to my initial expectations there was not an organized fireworks event in the town this year; there was however a rich crackling activity, as well as an event that I had not foreseen, i.e. dogs disturbed by the noise! This 9'5'' audio file is an edited version of a recording of about 30 minutes long. In this edit I tried to capture the natural flow of the sonic energy created and to include important events (i.e. a serendipitous human presence: merry and expressive new year wishes from a house at about 100 m away to the right of the recording spot, appearing at 4' 32''). This recording can be used as a demo for a panoramic soundscape, a memorandum of a unique event, etc.

Tags: New Year's Eve Corfu Greece; panoramic soundscape; festive tradition; fireworks; church bells; dogs.

Writer's Suggestions:
Listen to the dog sounds. When in the recording are they evident? Discuss the possible effect of the sounds of fireworks on animals like dogs. Compare the sound sensitivity of dogs and humans.

Describe the sonic identity of fireworks. How would you guess that the sounds heard are fireworks?
Why do you think people use fireworks in their celebrations?

What other sounds can you hear in the recording? Do they have any common characteristics?

How would you describe the sonic identity of the New Year celebration in your country/area? Do you notice any similarities and differences?

Recording no 161: 'Corfu Bees' ▷

Place of recording: Between the villages of Pelekas and Sinarades of Corfu
Name of recordist: Andreas Mniestris / *andreas@ionio.gr*
Date of recording: 14/1/2018 - 17:00

Recordist's notes:
This is a very simple and unprocessed recording (except from a gentle fade-in and fade-out), just placing the microphone (a recording device) very near the entrance/exit of the beehive. In the middle of the winter the population of this colony is rather diminished compared to spring but still there is enough movement to create representative sonic material. Notable also is that in this particular location there are very few other beehives nearby and also that they are spread quite far from each other. Therefore the captured sound is representative of this particular beehive without important sonic interference from the others. In this recording, we aim to take a snapshot of the particular buzzing sound that the insects make when flying. Here there is an attempt to capture the in-and-out movement of a small colony of bees (which means that there is not a significant number of individuals moving at any certain moment, thus giving the recording a more focused character, instead of a heavily loaded noisy environment that would be caused by a very large number of individuals moving at the same time). Also important at times is a doppler effect, when movement is happening to-and-fro around the recording device's microphones.

Tags: bioacoustics; animal sounds; bees; doppler effect

Writer's Suggestions:
You can read this: (go to location).
Based on the above article, bees flap their wings at a speed of about 230 times per second! This is very fast, compared to other insects such as the fruit flies, which are 80 times smaller than bees but flap their wings at a lower speed (200 times/second). It is expected that the smaller the animal the faster it flaps (i.e. mosquitoes frequency is over 400 beats / second).

With your eyes closed can you distinguish the sound of a bee from that of a mosquito?[30]

30 While in everyday experiences, our sensory systems of hearing and vision collaborate in order to provide us with a better understanding of events in the environment, isolating the sense of hearing could be a useful exercise. It can increase our attention to sound stimuli and help develop and refine auditory perception. Elina Kalampokini and Xenia-Markella Svarnia describe such a listening game > entitled: 'Close your eyes, see the sound' (Appendix II)

For older students: Record the sound of a bee or a mosquito, import it to the program 'Audacity' and change its frequency so that it sounds more like the other insect (bee to mosquito almost double speed, and the opposite, almost half speed).

What kind of sound do the bees contribute to a summer soundscape? (describe its morphological characteristics i.e.

- loud vs. soft,
- continuous vs. interrupted,
- high vs. medium or low,
- static vs. moving,
- melodic vs. rhythmical,
- grainy vs. smooth,
- the kind of attack, body and tail (envelope) of the sound
- other

How would the ecosystems be different if there were no bees?
How would the summer soundscape be different if there were no bees? Discuss the direct effects on the soundscape due to the lack of bee sounds, but also the indirect effects due to changes in other living organisms of the environment, negatively affected by the absence of bees.

With your eyes closed, can you guess if a bee is approaching you or moving away from you? What information does the brain use to make this decision? Discuss the effect of distance on energy levels and also the doppler effect (see this video >). When the sound source is approaching a standing listener, the pitch (tone) becomes higher, whilst when it moves away from them, the pitch becomes lower).

Recording no 162: 'Olive branches and shrubbery burning in a controlled fire'. ▷

Place of recording: My House (Balumbi-Sinarades_Corfu, Greece)
Name of recordist: Andreas Mniestris / *andreas@ionio.gr*
Date of recording: 23/3/2018, 15:30

Recordist's notes:
These are 2 instances of a longer recording done quite simply using a portable medium quality recorder. One of them has been processed very slightly with a denoise software (BIAS Soundsoap Pro). The second is just an unprocessed edit from the longer recording. This belongs to a series of recordings under the general theme 'The Soundscape I live In'. The general idea behind this series is to present sonic fragments of the annual and circadian cycles of the soundscape around where I live (in the countryside of Corfu, facing the sea). The sound of the two recordings presented here, comes from an activity that happens every February-March and is related to the pruning of the Olive Trees (Corfu is full of them), and depicts the procedure that follows the pruning, during which branches and leaves are burned in order to avoid summer fires. Here except for the olive branches, shrubbery was also cut and burned, and-noticeably so-they make quite a different sound. In these two recordings I try to capture the sound of olive branches and leaves burning (recording #1), as well as the sound of the burning shrubbery (recording #2). It is certainly not as clear as in reality, but some of the sonic qualities and their differences have been captured. I have decided to present the recording #1 slightly de-noised, just to facilitate further use by composers.

Tags: fire; agricultural activities in Corfu; olive branches burning; shrubbery burning; geophony

Writer's Suggestions:
Listen to the recording of olive branches-and-leaves burning and mark on paper its energy peaks and the energy low areas. How many peaks do you hear?

Now listen to the recording of burning shrubbery. Compare the sounds of the two kinds of material on fire. Do you hear any differences?

Recording no 173: 'Harbor Mooring line 01' ▷

Place of recording: Rethymno, Greece
Name of recordist: Nikolas Valsamakis
Date of recording: 29/01/2018, 18:40

Recordist's notes:
Microsonic detail of the rope of a boat. In the background there is the ambience of the marina of Rethymno with sounds of the sea, people's voices, motorcycles passing.

Tags: harbour; boat rope; Rethymno; Greece

Writer's Suggestions:
Describe the characteristics of this sound-producing instrument (rope): rhythmic, tonal, textural etc.

What animal makes similar sounds to the sounds of the rope? What musical instrument sounds like it? How could we make these sounds using our body and our mouth in particular? What are the most prevalent characteristics of these sounds?

Is the sound of the motorcycle masking the sound of the rope? If so, when in the recording?

Recording no 193: 'Watering the flower in clay pots' ▷

Place of recording: Loutra, Rethymno, Greece
Name of recordist: Katerina Tzedaki / tzed@otenet.gr
Date of recording: 21/07 2017, 21:25

Recordist's notes:
Summer night in the front yard of the house. Watering the plants in the clay pots of the yard using a hosepipe. The recorder has been positioned on a wooden shelf close to the front plant, almost 10 cm near the plant and 1,5 meter high from the ground level, facing the soil in the flower pot. The absorption of the water from the dry soil produces some very interesting sounds and rhythms. As 8 clay flower pots are absorbing the flowing water, several sounds and rhythmic structures are created. Night soundscape of the village in the background.

Tags: human activities soundscape; water; absorption of water; watering of plants; village night soundscape; dog

Writer's Suggestions:
Identify two kinds of water sound (continuous water stream sound, bubble sound) and describe their characteristics.

When in the recording can you hear the bigger/louder bubbles?

If you listen to this recording as music, how does it develop in time? Is it characterised by a continuous crescendo, does it have a crescendo until it reaches a peak and then a decrescendo, or does its dynamic level remain about the same from beginning to end?

A prominent sound in this recording is that of water bubbles. Learn about the phenomenon of cavitation (bursting of bubbles). In this booklet, (go to resource >), you can find information by the Cornell Lab of Ornithology. about how and why the *Snapping Shrimp* uses cavitation as a weapon. Also you can find information about the cavitation of sea water bubbles produced by the propellers of ships in the oceans, which create noise pollution with detrimental effects on many sea animals.

If you don't already know how to make water bubble sounds with your mouth, watch the following videos and experiment in producing these sounds:
resource 1, resource 2, resource 3.
After doing this, as a group, try to improvise the soundscape of watering flower pots (remember to include the two kinds of water sound and the dog barking in the distance).

Recording no 216: 'Schuman bridge echoes, France' ▷

Place of recording: Saône river, Lyon, France
Name of recordist: Gilles Malatray / *desartsonnants@gmail.com*
Date of recording: 26/11/2017 – 21:00

Recordist's notes:
The recording took place under the arch of the Schuman bridge, where echoes of people's voices can be heard. Six to eight echoes are produced that resemble in beauty those heard on mountains. Many tester sessions took place using the human voice and a vuvuzela (instrument) in order to study the echo: the delay time, the sounds' layering, how they cross each other. Different positions were tried: in front of the opposite wall; on the other side; back turned to the river etc. A dog is heard in the recording. Passers-by and joggers tested the echoes. The acoustic features of this bridge are rare. Although it is common to find spaces, which favour the creation of echoes (i.e. symmetrical blocks of buildings), it is rare to encounter so many and surprising echoes in an urban landscape. The bridge constitutes a kind of urban sound design – surely without the constructors' awareness!

Tags: urban echoes; dog; foghorn; modern bridge sounds; soundmark; anthropophony; France

Writer's Suggestions:
You can learn about the echo and find exercises to help you solve mathematical problems regarding echo on this web site >

Related information:
Distance Travelled = Speed of Sound X Time Taken or
Time Taken = Distance Travelled / Speed of Sound
(The speed of sound in air is about 330m/s and in water 1500m/s. The time and distance are considered so that the signal would begin at the source of sound, reach the obstacle and return back to the source/listener).

What information can we infer if we listen carefully to echoes?
You can watch and listen to this video > (Echoes of a 50,000 Rial bill in Masjid-e Imam, Isfahan, Iran (Dec. 2007)). Discuss the possible reasons for building churches that have high reverberation and even echoes?
What would the results of such building characteristics be in a classroom? Find information about the negative effects of high reverberation in speech perception.

Recording no 218: 'Corfu Radar'. ▷

Place of recording: Corfu Radar, Agioi Deka, Greece
Name of recordist: Andreas Mniestris / *amnies@gmail.com*
Date of recording: 4/2/2018, 15:30

Recordist's notes:
There are 2 recordings, one facing the town and the other facing the radar. The aim of this pair of recordings is to demonstrate the drastic alteration of the natural soundscape caused by the sounds produced continuously by the generators that are the power supply of the radar installations.

Tags: radar-generator; sound pollution; rural remote soundscape

Writer's Suggestions:
Listen to the two recordings, the one with the microphone facing the town, and the other with the microphone facing the radar. How different do they sound? Why do you think they sound different? Would you say the microphone and the human outer ear are filters?

How do the different types of microphones, and the ways they are placed and directed, affect the impression of the sonic environment they reproduce? You can get information about microphones from this link >. Also discuss the functions of the human outer ear as a filtering and localizing mechanism when listening to the sounds of the environment.

Listen to the two recordings and mark the times when you hear a dog breathing and an insect flying. Watch this video >
"Gordon Hempton wants to keep forests free from artificial noise. He takes NBC News' Gadi Schwartz on a tour of Washington's Olympic National Park to find "One Square Inch of Silence." Published on Jun 29, 2018, NBC News.

Discuss the ‘no noise places’ in nature, city silence-retreats in western countries and the effects of the sounds of ubiquitous electricity and other sources of sound pollution on humans and other animal and plant species.

Go on ‘silence-hunts’ and locate the best no-noise places at your home, at your school, in your town, in a park or in a natural environment away from town. Visit these places during various times of the day and of the year and measure the noise levels using a decibel meter. Repeat these visits over the years and keep records of your measurements and on the kinds of sounds you have heard. Do you think that it is important to protect the sanctuaries of silence? If so, why?

When we talk about silence in natural habitats, what do we mean? No sound energy at all, or something different?

Conclusion

With the introduction of the topic of silence, we reach the end of this chapter in which we attempted to present a small number of recordings from the Erasmus+ program *The Soundscape we live in.* Mostly, we hope that through these few examples, we demonstrated an educational approach for listening and analysis of recorded soundscapes and for using them as a starting point in teaching. Given their short duration and the accompanying photographs as well as the recordist’s comments available to the educator through the website of this Project, this bank of recordings could become a valuable teaching tool for many disciplines. As introduced in Chapter 2, applying various ways of listening to the recordings included in this book but also those available online, could spark students’ motivation for research and artistic sound-based explorations of the environment. Most importantly, it is hoped that it will encourage them to step out of the classroom and visit the real soundscapes, thus acquiring first hand knowledge about the environment and their own self as empathic listeners and co-creators of the world soundscape.

Concluding Thoughts

Ioanna Etmektsoglou

The present listening project, as experienced from the point of view of the writers of this book (a psychologist of music, a music educator and a composer), revealed the potential and need for communication and collaboration between artists and scientists whose subjects are related to sound, soundscape and music in the environment. Beyond the arts of music, dance, theatre and cinema, sound is a major or minor concern in many fields of scientific knowledge and applications, such as physics (acoustics), architecture, urban planning, biology, medicine, psychoacoustics, psychology of music, music therapy, music education, and the more recently established fields of bioacoustics, acoustic ecology, soundscape ecology, acoustemology, to name the most obvious ones. The music educator of our times may not have adequate knowledge in all these fields in order to design curricula and lessons that are meaningful and inspiring for a life-long education. Therefore, in addition to restructuring teacher training with this in mind, we could seek a better synthesis of knowledge through communication with artists and scientists of various sound-related fields.

Murray Schafer created a space for such exchanges and communication at the beginning of the 1970s through the establishment of Acoustic Ecology as an academic cross-disciplinary field of study. Acoustic Ecology naturally reflected the personal aspirations of M. Schafer as well as the cultural, political, economical and geographical characteristics of its place and time of origin. Many similarities and differences can be identified between Canada in the 1970s and Europe in 2019. Especially in terms of sound, rapid technological and socio-economic changes have modified the soundscapes we live in immensely and continue to do so every day. In the stream of these mixed changes, sometimes positive but often detrimental for the future of life, Acoustic Ecology can still be thought of as an umbrella for collaborations and dialogue about the sound and its multiple functions in soundscapes and ecosystems.

Listening to the soundscapes we live in has been approached in this book as a means for increasing knowledge and awareness of life and life processes through sound; using sound as a means for encouraging younger and older inhabitants of European lands to move beyond the individual to embrace the other in their societies and their cultures; to move beyond the human to embrace other living species of fauna and flora; to move beyond the ground to embrace the skies and the seas. A turning point in the empowerment of sound as an educational means was the expansion of music from the concert hall to places of nature and civilization, contributing to the development of an expanded ecological identity. Listening to the soundscapes we live in as amateur artists and scientists can lead beyond knowledge, understanding and aesthetic pleasure, to the development of empathy with humans and other species, as well as to an increased sense of ownership of the environmental problems and the urgency to solve them.

Learning to listen is a lifelong endeavour. According to Ingold (2000), “what each generation contributes to the next [...] is an *education of attention* (Gibson, 1979: 254)” (pp. 21-22) and an important way to achieve this education is by directing student’s attention to certain things in the environment while at the same time asking them to look, touch, taste, smell or listen! This act of listening might “lift a veil off some aspect or component of the environment so that it can be apprehended directly” (ibid). As educators, parents, caregivers, friends, artists, performers, researchers, whilst continuing our own journey in educating our attention, we can share the gift of informed and empathic listening with the younger generation by pointing and whispering with a soft voice: Listen!

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A SOUND-BASED EDUCATION

For Listening, Appreciating, and Co-creating
The Soundscapes We Live In

END OF PART I

A SOUND-BASED EDUCATION

For Listening, Appreciating, and Co-creating The Soundscapes We Live In

PART II

APPENDICES

APPENDIX I

Supplementary material created by Ioanna Etmektsoglou

For Chapter 2

'Listen! Listen and... ' Card Game

'Listen! Listen and... ' Card Game Ioanna Etmektsoglou EPHMEE, Music Department, Ionian University, 2014	
1 CLOSE YOUR EYES AND LISTEN!	2 LISTEN! CAN YOU FIND TWO VERY DIFFERENT SOUNDS?
3 CLOSE YOUR EYES AND LISTEN! WHEN THE TIME IS UP, WRITE AS MANY SOUNDS AS YOU REMEMBER FROM ALL THE SOUNDS YOU HEARD.	4 LISTEN TO THE INTERNAL SOUNDS OF YOUR BODY!
5 LISTEN TO YOUR THOUGHTS! WHEN THE TIME IS UP, WRITE DOWN AS MANY AS YOU REMEMBER.	6 LISTEN!
7 LISTEN AND IMAGINE! WHEN THE TIME IS UP, WRITE WHAT YOU IMAGINED.	8 LISTEN TO THE SILENCE!
9 LISTEN! CHOOSE ONE SOUND. WHEN THE TIME IS UP, WRITE WHAT YOUR SOUND WAS LIKE AND IF IT WAS CHANGING!	10 LISTEN! WHEN YOU HEAR A MOBILE PHONE RINGING, TRY TO GUESS THE LOCATION FROM WHERE THE SOUND IS COMING.
11 WALK AROUND THE ROOM ON YOUR TOES AND LISTEN!	12 COVER YOUR EARS WITH YOUR HANDS AND DO NOT LISTEN!

For Chapter 4

'BEAVER' Worksheet

ANIMAL: _____
Genus: _____ Species _____ Approached through the model B.E.A.V.E.R. (Etmektsoglou, 2018)

Author/s:_____

BEST IN:

EGO - ANIMAL AS A PERSON

ADAPTATION

VOICE UNIQUE CHARACTERISTICS

ECOSYSTEM - SOUNDSCAPE BALANCE

Ecosystem Balance

Soundscape Balance

RELATION TO HUMANS

References

Audiovisual Resources

ANIMAL: Apus apus (Swift)

Genus: Apus Species: A. Apus
Approached through the model B.E.A.V.E.R. (Etmektsoglou, 2018)

Author: Ioanna Etmektsoglou

BEST IN:

-They moult while flying (Jukema, van de Wetering & Klaassen, 2015).

-They mate in the air!

-They sleep in the air, usually 1-2 kilometers high (Bäckman & Alerstam 2001, in Henningsson, Karlsson, Bäckman, Alerstam, & Hedenström, 2009).

-They can fly at the speed of 210 kilometers per hour avoiding obstacles (“Protection of the Common Swift and bats in buildings in Slovakia”). At the speed of 111.6 km / h recorded, they are considered the fastest birds in level flight (see Bourton, 2010).

- They have short, strong legs and use their claws to grip themselves from steep vertical surfaces (“Protection of the Common Swift and bats in buildings in Slovakia”).

EGO - ANIMAL AS A PERSON

-They live in nests only when they mate and are raising their nestlings.

-Adult Swifts do not moult while they are looking after their nestlings so that they could save energy and provide them with what is needed. They wait for this change until they are in Africa in autumn when their juveniles are independent (Jukema, van de Wetering & Klaassen, 2015).

-If a building is being renovated while the little ones are already in the nest, the parents are very often captured in their nests whilst trying to protect them and slowly die of thirst and starvation (“Protection of the Common Swift and bats in buildings in Slovakia”).

-They may have accidents whilst flying. If they fall onto the ground, they then need help to take off again or they might die.

ADAPTATION

-Because they are airborne birds, they change their wings one at a time, so their ability to fly is not impaired (Jukema, van de Wetering & Klaassen, 2015).

-It is likely that they regulate their velocity between gliding and flying by moving their wings so that there are no great differences in their velocity or in their drops-ascensions (Henningsson, Karlsson, Bäckman, Alerstam & Hedenström, 2009).

-When the weather is bad, parents leave their little ones for days so that they can find food in remote places. In order for small nestlings’ organism to withstand the lack of food, they fall into lethargy so that their metabolism decreases. They can survive without any food for 8-10 days (“Protection of the Common Swift and bats in buildings in Slovakia”).

-They glide in the air and thus reduce energy losses. 40% of their flight consists of glides (Henningsson, Karlsson, Bäckman, Alerstam & Hedenström, 2009).

- Their feet are adapted to grip and not to stand. One of their four toes (analogous to the human thumb) is not opposed the other three, and each one has only two bones (Van Grouw, 2013).

VOICE UNIQUE CHARACTERISTICS

-They scream! Especially during their parties.

-According to Bretagnolle (1993) the Swift has three different types of calls:

> **Long Screaming Call.** It has two parts, the first with a basic frequency of around 2,500 Hz and periodic amplitude modulation around 200 Hz, which gives the sense of pulsation to the sound of Swifts, and the second is the trill with a small number (5-7) of short syllables. In part of the trill, the basic frequency drops and there is no pulse. In a pair, one Swift (perhaps the male) has faster trills than the other. The Long Screaming Call is used to attract the female for mating, to define and preserve the territory, or when the Swift suffers.
>
> **Duet Screaming Call.** Its duration is approximately half of the Long Screaming Call and usually has a lower pitch. In addition to defining the territory, the Duet Screaming Call is also the sound identity for each individual Swift (especially the last part, the trill) but may also be used to synchronize behaviour.
>
> **Nest Call.** It is produced inside the nest by one Swift, while the other is present and there are no eggs or nestlings inside. Probably it has a sexual function and is used for mating or re-mating.

Other types of calls by adult Swifts have also been mentioned, such as the 'piping-call' that comes out when they are defeated, and the 'pre-copulatory call' which is the call before mating. The most frequent call by nestlings is the food call which they make when their parents approach the nest with food (in Thompson, 2006).

ECOSYSTEM - SOUNDSCAPE BALANCE

Ecosystem Balance

-A Swift can catch nearly 20,000 mosquitoes in one day! It also eats spiders (BirdLife International, 2016; "Protection of the Common Swift and Bats in Buildings in Slovakia").

-Human Interventions: Because of the renovation of buildings in Great Britain, the number of Swifts has decreased by about 33% from 1995 to 2011 ("Protection of the Common Swift and Bats in Buildings in Slovakia").

- In Slovakia, the Swifts are considered to be a protected species and therefore there is legislation that forces those responsible for the renovation of buildings to protect the nest of the Swifts or to create alternative nests for them ("Protection of the Common Swift and bats in buildings in Slovakia").

Soundscape Balance

-They characterize the soundscape of some cities or regions as seasonal soundmarks (i.e. sounds of Swifts as a summer soundmark of the old town of Corfu).

- In terms of sound, they activate high areas in the sky that, without the sounds of the Swifts, would remain inaccessible to human attention (except for the mechanical sounds of airplanes).

-They emit their sounds at frequencies of 2000 - 5000 Hz and higher in the spectrum, and with high amplitudes, making them heard clearly by the human ear. Sometimes they *dominate* the summer soundscape considerably.

-They make the soundscape interesting due to their unexpected and very quick movements as sound sources in space.

RELATION TO HUMANS

-They participate in parties! Even the young Swifts (2nd calendar year), who do not yet mate, participate with adults in the 'screaming parties', a special social behaviour involving fast and low flights of a large number of Swifts (Henningsson et al 2010; Jukema, van de Wetering & Klaassen, 2015).

-Their wings are made of keratin, a protein, like human hair and nails (All About Birds, 2008).

-They make 'balls' of mosquitoes and other insects which they mix with saliva in their throats and give them to their little ones ("Protection of the Common Swift and bats in buildings in Slovakia").

References

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Audiovisual Resources

https://www.xeno-canto.org/466677
https://www.hbw.com/ibc/species/common-swift-apus-apus
https://identify.whatbird.com/obj/876/overview/Common_Swift.aspx
https://www.swift-conservation.org/hot_links2.htm
https://ravensoundsoftware.com/software/raven-lite/(free software)

Images

Source: Retrieved on 5/6/2018
from BBC-Earth News >

For Chapter 5

Decipher the Call: From Sound to Design, to Sound

Ioanna Etmektsoglou (8/2017)

- Listen carefully to the animal's recorded call. Listen to it once, twice, three, four, five times. During the activity you can listen again every time if you think you need to notice something more carefully.

- What is the animal you hear? Definitely _____ Perhaps _____ or_____ I don't know_____

- What kind of call is it? If you cannot recognize it, you can try to guess. Is it:

a) To define its territory?_____ b) To defend its territory?_____
c) To attract its partner?_____ d) To communicate with its family?_____
e) To trigger an alarm without revealing itself to the enemy?_____
f) To ask for food? (if it is a very young animal)_____ g) To express fear?_____
h) For another reason?_____
i) What might be this reason?_____ j) I do not know_____

- What other sounds can you recognize in the recording?

- Is this particular call of _____ related to other sound(s) of the soundscape? If so, how do you think is it related?

- Which instrument would you choose to reproduce this call? Why?

- Does it resemble any sound from nature or a machine?

- If you had to mime the call with phonemes, what letter combinations would you choose? i.e. pee-ou, kt-kt-kt-kt, ah-ou. Write here:_____

- How do you think this call develops? How does it start? how does it go on? how does it end?

a. it moves from high to low pitch? _____
b. it moves from low to high pitch? _____
c. stays firmly in the same pitch? _____
d. it is short? _____
e. it is repetitive?_____
f. it has many different sounds and seems like a complete phrase?_____
g. it includes trills?_____
h. it has many silences _____ several ____ a few _____ not at all? _____

Make a drawing showing the call developing in time:

- *The pencil touches the paper and moves steadily to the right as you hear the call progressing.*
- *While moving to the right, it goes to the top of the page when the pitch is high, and to the bottom of the page when it is deep, bass.*
- *When there are silences, lift the pencil so it does not write on the paper; however, continue moving it to the right, up in the air.*
- *When the sound is loud, press the pencil so it makes a sharp line, and when soft, touch it lightly so it draws a faint line.*

After you have completed the drawing, try to use it as reference while memorizing it and then teach it to a friend.

Extract from a letter of complaint about a noisy electrical appliance

To: *Z Company's* Customer Service
Corfu, 24/10/2018

Dear Sir / Madam

I'm writing to you about the problem I'm facing with the Z12345 refrigerator of your company that I recently purchased. I am extremely unhappy with the noise it makes. The type of noise has qualitative features which makes it particularly annoying to the human ear. It is not a deep, low-intensity, continuous sound, but a variety of sounds that are periodically and non-periodically activated and have a varying frequency over time. To briefly describe the sound stimulus quality, please imagine knocking sounds that could refer to mechanical or manual work on a medium that creates resistance, as the sounds are neither uniform nor rhythmic. In between these percussive sounds, melodic glissandi with more descending than ascending parts are heard, which, based on their frequency content and envelope, convey the sense of a cry of despair or exhaustion from great effort.

Perhaps you can assure me that your fridge produces the minimum decibel for its class: 39 or 40 dB. Indeed, I must admit that regarding the continuous low sound, your company's technology has managed to reduce noise. However, nowadays noise is no longer measured only in decibels, because the annoyance caused by sound to a person depends both on its quantitative and qualitative characteristics. The Canadian acoustic ecologist Murray Schafer described noise as an *unwanted sound*. Even a soft sound when suddenly produced in the middle of the night can be considered noise. In view of the above, your company, before placing a new product such as this refrigerator on the market, in addition to quantitative research should carry out psychoacoustic tests with prospective consumers in real homes, in order to determine the degree of sonic discomfort they attribute to the new product. Such an approach is quite likely to encourage your researchers to develop more human-friendly products, and would provide the consumer the option of choosing a specific refrigerator by taking into account the noise it produces based both on quantitative and qualitative data.

As for the Z12345 refrigerator of your company, which I recently purchased, please be sure to replace it with a corresponding one, also A ++ class, which will not awaken one at night with its sounds, even if it is placed in a small apartment, without a separate kitchen. Please proceed to the necessary actions so there will be an immediate solution to the problem. Thank you.

Yours Sincerely,

Ioanna Etmektsoglou

Dealing with a Problem of Sound Pollution

Ioanna Etmektsoglou, 2017

Working Team: Location:
Starting Date: Completion Date:

<table>
<tr><td rowspan="6">Source of Sound Pollution</td><td>What is the source of sound pollution? (i.e. motorcycles, music from loudspeakers, etc.)</td><td></td></tr>
<tr><td>How often is it heard?</td><td></td></tr>
<tr><td>How loudly is it heard? (subjectively and in decibels)</td><td>Extremely Loudly 5 4 3 2 1 Not very loudly
Decibels:</td></tr>
<tr><td>What are its main sound characteristics? It is:</td><td><table><tr><td>Melodic – Non Melodic</td><td>Rhythmic – Not Rhythmic</td></tr><tr><td>Continuous – Interrupted</td><td>Short - Long</td></tr><tr><td>Rough – Smooth</td><td>Thin – Fat</td></tr></table>Draw its Sound Envelope:

_____
(attack, development, steady state, decay)</td></tr>
<tr><td>Why does it happen?</td><td></td></tr>
<tr><td>How has the sound changed through time? (previous years to now)</td><td></td></tr>
<tr><td rowspan="3">Sound Context</td><td>Where is it produced?</td><td></td></tr>
<tr><td>Where can it be heard?</td><td></td></tr>
<tr><td>How has the context changed through time? (previous years to now)</td><td></td></tr>
<tr><td rowspan="4">The Listener</td><td>Who is pleased with this sound?</td><td></td></tr>
<tr><td>Who is bothered by this sound?</td><td></td></tr>
<tr><td>To what extent are they bothered?</td><td></td></tr>
<tr><td>Why are they bothered?</td><td></td></tr>
<tr><td rowspan="4">Intervention</td><td>What actions have taken place on a personal level (i.e. speaking with the neighbour)?</td><td></td></tr>
<tr><td>What actions have taken place with regard to information-education?</td><td></td></tr>
<tr><td>What actions have taken place with regard to authority control?</td><td></td></tr>
<tr><td>What actions have taken place with regard to changes in the law?</td><td></td></tr>
</table>

APPENDIX II

Material from Projects created by Elina Kalampokini as a collaborator of the Erasmus+ Program

(Supervision: I. Etmektsoglou)

Project I: 'Games in the Depths of Sound'

Aims:

- ✔ To develop empathy skills, awareness on problems caused by waste disposal and respect for the environment.
- ✔ To learn basic terms of Acoustic Ecology and about the importance of sound to sea creatures.

Context of Application:

'Games in the Depths of Sound' are of dual importance. They refer to sounds that are deep in the sea, but also to communication and survival. They were held as part of a Festival organized by the *Alternative Cultural Workshop* of Corfu. The project took place in late May 2018 in the central square of the town. We presented work that was produced with a group of people during a course in Acoustic Ecology, the aim of which was to highlight the importance of sound in people's and animals' communication as well as in their interaction with the environment. The games can be implemented in the school curriculum as single activities or as part of a wider project, as well as in other educational contexts. I would suggest a similar project titled 'Games in the Heights of Sound' which would refer to high-pitched sounds or sounds of birds or sounds of insects.

I would like to thank Christian Pouli, Xenia Svarnia and Maria Halkiadaki for their support.

Activities

1. Can you finish the dialogue?

Age	7+
Number of participants	2
Objectives	To understand the problems caused by noise interference in communication; To understand that many animals face similar problems in their communication
Materials	3 headphones, 2 microphones, PC

Procedure:
Each player (Player A and Player B) holds a card with a dialogue on it and has a microphone and a pair of headphones. The game coordinator is on the computer and also wears a pair of headphones. Players sit apart so that they cannot hear each other. They start to reproduce the dialogue, each reading what is indicated in the text. Using a special voice filtering computer software, the game coordinator turns their voices to a higher or lower (bass) pitch. Things are getting harder as the effects cause laughter and therefore additional masking of the voice. Then, other interferences and effects are added as barriers to their communication. Will players be able to read the dialogue to the end and understand its content? If not, why? Discussion follows on sound masking. Which sounds were more disturbing in hearing and understanding speech? What were their distinctive features that led to more masking?

2. Voices of the Sea – Match Game:

Age	7+
Number of participants	1-3
Objectives	To recognize certain calls and songs by various whales and other cetaceans
Materials	PC, 1-3 headphones, Internet

Description:
An online game where players listen to a sound and match it with the marine animal that produces it.
Source: The Pacific Life Foundation http://cetus.ucsd.edu/voicesinthesea_org/games.html

3. Trivial Pursuit – Sound Knowledge:

Age	7+
Number of participants	≥2
Objectives	To learn the basic terms of Acoustic Ecology (i.e. soundscape, sound-diversity, noise); general information about the ways in which living beings produce and perceive sound (what are the parts of the ear, where are the vocal chords); the characteristics of sound (which sound is shorter than other sounds, which animal produces low-pitched sounds)
Materials	Cards with questions on the above topics

Description:
In turns, players pick a card from the pile and read aloud the one question and the possible three answers that are written on it. The correct answer is provided in brackets, so that it is obvious to the person who asks the question. The question game ends when the cards run out. There are no winners or losers.

Creator's general notes:
Headphones were used in the activity 'Voices of the Sea – Match Game' for better sound quality in the specific context. Depending on the context, there can be more headphones or loudspeakers. In the activity 'Can you complete the dialogue?' the interfering sounds do not necessarily have to be digital effects, as this depends on the game coordinator's knowledge on and ability to deal with technology, as well as on the learning context and age of the participants. The interfering sounds can be music or speech (with or without the use of a computer).

Trivial Pursuit – Sound knowledge Cards

Where does sound travel fastest? [1] 1. In solids 2. In liquids 3. In gases	Lions roar so that they: [1] 1. Communicate with each other 2. Scare people 3. Scare their prey
Human vocal chords are: [2] 1. In the brain 2. In the larynx 3. On the back	Woodpecker's third ear is: [2] 1. On its legs 2. On its tongue 3. On its belly
Syrinx in birds is the name for: [3] 1. Their food 2. Their nose 3. Their vocal instrument	Sound-diversity is defined as: [1] 1. Many different sounds in a soundscape 2. Many similar sounds in a soundscape 3. No sound
Which of the three is the noisiest place in the morning? [1] 1. A school 2. A night club 3. A library	What is biological echolocation? [2] 1. A plastic toy for dogs 2. The use of echo by animals to detect objects in the dark 3. Conversation on Walkie Talkies
Which of the three is the quietest sound when heard from 10 meters away? [1] 1. A clock ticking 2. A plane taking off 3. A school bell	A new queen bee identifies itself to other queen bees, drones and workers by: [3] 1. Whispering 2. Shouting 3. Producing a sound by moving its body (queen bee piping) 4.
A bird marks its territory by: [2] 1. Blinking its eyes 2. Singing 3. Moving its left wing once	A typical bat makes about: [1] 1. 400.000 different sounds every night 2. 1.000.000 different sounds every night 3. 400 different sounds every night

Which of the three is the noisiest during the night? [1] 1. A night club 2. A library 3. A school	The sounds people or other animals can hear at a specific location are called: [2] 1. Sound recording 2. Soundscape 3. Pitch
We measure how loud or how quiet a sound is in: [3] 1. Kilos 2. Joule 3. Decibel	The situation where there is barely any sound is called: [1] 1. Silence 2. Music 3. Noise
What is sound pollution: [2] 1. Many instruments 2. Sounds that ruin the balance of a soundscape 3. Plastic waste	The wind is: [2] 1. Mechanical sound 2. Geophysical sound 3. Biological sound
Which of the three sounds is continuous: [2] 1. A sudden shout 2. Leaves rustling 3. A bang on a drum	The heart beat is: [3] 1. Mechanical sound 2. Geophysical sound 3. Biological sound
The sound of a chainsaw is: [1] 1. Anthropogenic mechanical sound 2. Geophysical sound 3. Biological sound	A soundscape is hi-fi when you can hear: [3] 1. Only high-pitched sounds 2. Many sounds 3. All sounds in every detail
The male frog possesses a vocal sac which is used to: [3] 1. Better chew his food 2. Keep his balance 3. Amplify his voice	Ultrasound is: [2] 1. A beautiful sound 2. A very high pitched sound we cannot hear (over 20.000 Hz) 3. A musical instrument
Cicadas produce their sound: [2] 1. In their larynx 2. Through membranes that pulse on their thorax and belly 3. On their legs	Which of the following animals does not have ears: [3] 1. Weasel 2. Leopard 3. Snake

Which of the following animals buzzes? [3] 1. Elephant 2. Lizard 3. Cicada	Infrasound is: [1] 1. A very low pitched (bass) sound we cannot hear (below 20 Hz) 2. A sound from the floor below 3. The sound of the Earth
Which of the following animals has the biggest ears: [1] 1. The African elephant 2. A Basset Hound dog 3. The domestic fly	Crickets have their ears: [3] 1. On their head 2. On their antennas 3. On their legs

Suggested literature

Fratzis A. & Alexiadou, P. (2003) Ta kitodi ton ellinikon thalasson [Cetaceans of the Greek Seas]. Athens: Elliniko Kentro Thalassion Erevnon (ELKETHE) Retrieved from here >.

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Suggested Resources

- http://cetus.ucsd.edu/voicesinthesea_org/games.html – Web Game: Voices in the Sea - Call matching)
- https://www.oceancare.org/en/startpage/ – *Ocean* Care: Website with activities about protection of sea life and awareness
- http://archipelago.gr/en – Website of 'Archipelagos'-The Institute of Marine Conservation in Greece
- https://dosits.org/ - Website by the Rhode Island University and Inner Space Center about sounds in the sea

Project II: Acoustic Ecology Lessons for Adults and for Children at the "Alternative Laboratory" of Corfu

Elina Kalampokini, Polyxeni-Markella Svarnia

A. Acoustic Ecology for Children (4 months)

Activities

I. Soundghosts:

Materials: Computer, speakers, mobile phone
Suggested ages: 5-9
Number of participants: 2-25

We select a point in the classroom that is not visible to children and we place a media player there. We have chosen the sound of an insect to be played. We preferred a sound that could be heard naturally in the classroom environment. Shortly before the children enter the classroom, we start playing the sound, adjusting the volume to a level that seems real. We look forward to seeing the reactions of the children. If they do not realize the presence of this sound, we help them recognize it by turning their attention to it through guided questions. The activity ends when the children find the sound source. Then there can be a discussion about how we can perceive the source of a sound without being visible to us.

II. Close your eyes, see the sound

Materials: self-made musical instruments, everyday objects
Suggested ages: 5-9
Number of participants: 2-25

The teacher has objects at his/her disposal with which he/she produces sounds (balloon, paper, metallic lid, etc.). All students close their eyes and try to understand, what the object is that produces the sound they hear. They are then asked to tell where they could place this sound (e.g. a rustling paper may fit into a school environment). Different answers can be heard and they are all acceptable if participants can support them with a rational connection. Then there can be a debate about whether they could hear a similar sound in nature, where they would hear it, and what its sound source would be.

III. Put some sound

Materials: Anything from the school environment
Suggested ages: 5-9
Number of participants: 2-25

We choose a student who is asked to replicate a situation or a daily habit without making any sound. The rest of the class produces sounds for every observed movement, either by body percussion or by voice. Everyone is trying to find the sound they think is most representative of every movement they see.

Registration day reception for the acoustic ecology class
(E. Kalampokini –P.M. Svarnia)


‘Acoustic Ecology for children’ class

B. Acoustic Ecology lessons for adults

Aim: The purpose of this course of lessons is to familiarize the participants with the science of Acoustic Ecology and its key terms and concepts. Through examples and experiential activities to encourage them to discover familiar sounds and their place in daily life.

Activities:

1. Soundtangling:

We play sounds on the computer and we ask the participants to identify the sound source of what they can hear. The audio examples are heard in pairs (e.g. fly-mosquito, vacuum cleaner-drill, apus apus-swallows) which would require their attention. It took place with ages from 21 to 65 years.

Materials: PC, speakers
Suggested ages: 18+
Number of participants: 10

2. Creating a Sound Map

We discover the Sound Maps and we bring examples, such as the Nature Sound Map (find it here >) and the Montreal Sound Map (find it here >). After we have heard some of the audio samples, we create our own Sound Map of the building floor where the classroom is.

Materials: Paper, pencil
Suggested ages: 18+
Number of participants: 10

3. Soundwalk in our neighbourhood

We discover again our neighbourhood through enactive listening and the soundwalk. We hear again the soundmarks of the town.

Materials: sound recorder device
Suggested ages: 18+
Number of participants: 10

Context of Application:
In the Alternative Cultural Laboratory of Corfu we met a group of people, that have the urge to communicate and share, as they claim: “A group of people with ideals and dreams for a society governed by humanity, solidarity, cooperation, creativity and support” (link to the site of this organisation >). So, we thought that this laboratory was a very good choice for a place where we could create and present a series of lessons about an alternative way of listening and perceiving the sounds of our environment, aiming for better and stronger communication. In the Alternative Cultural Laboratory all lessons are free and participants just enroll and may leave whenever they want.

Challenges:
Many people urged us to change the title of the course. Despite this, we kept the original title because we wanted to make the ‘Acoustic Ecology’ term known to the public even if this wouldn’t increase the number of the participants.

Dr Theodoros Lotis, Composer and Associate Professor
at the Department of Music Studies of the Ionian University
during a session of the course 'Acoustic Ecology: classes for Adults'

Pictures from the soundwalk in the town of Corfu

Elina (Styliani) Kalampokini *was born in 1993 in Trikala, Greece. She has studied electroacoustic music composition and music for performance arts at the Ionian University of Corfu. Her music education started from a young age initially with piano and music theory lessons, then with the flute and the guitar. As an active member of orchestras and choirs she participated in concerts in Greece and Europe. She is interested in sound exploration and teaching contemporary music to children and adults in the most playful way possible. A passionate musician always seeking challenging collaborations. (*elinakal_rose@hotmail.com*)*

Polyxeni-Markella Svarnia *was born in 1987 and grew up in Athens. She is a graduate of the Department of Folk and Traditional Music of the Technological Educational Institute of Epirus (TEI), in Greece, with a speciality in the santouri. She holds a Master's Degree in Music Education from the Department of Music Studies at the Ionian University, Greece, and attended the programme of Carl Orff & Dalcroze at the Moraitis School, Greece. She has worked as a music teacher also on a voluntary basis, and she has attended various seminars in music and music education.*

APPENDIX III

Practical applications by Undergraduate Students, Postgraduate Students and Music Teachers (for Chapters 2, 4, 5 & 7)

I. Practical applications of the 'BEAVER' model by Undergraduate Students

ANIMAL: Hummingbird (Troshilidae)

Approached through the model B.E.A.V.E.R. (Etmektsoglou, 2018)

Authors: Eleonora Zacharia, Vilma Katseli, Christina Lianou, Anna Mesanagrenou, Amalia Belia
Supervisor: I. Etmektsoglou

BEST IN:

What makes the hummingbird special in comparison to other bird species?
The hummingbird is the smallest bird in the world, the only one with the ability to fly upside down. It is considered to be one of the fastest birds. It is also the smallest animal species that has a spinal cord. Hummingbirds can fly in extreme weather conditions, such as heavy rainfalls, and against the wind. Their brain takes up the larger part of their body in comparison to other bird species (approximately 4,5% of their body weight), and has a big hippocampus, providing hummingbirds with a good memory. Excluding insects, it is the species with the fastest metabolism. The part of their tongue that sticks out of their beak is almost as long as the beak itself.

Are hummingbirds good "racers"?
Some hummingbird species can flap their wings in circular motion up to a hundred times per second, reaching speeds of up to 54 km/h. That means they can cover a distance of approximately 15 meters in one second. They can also fly in all directions, even upside down or backwards and hover for as long as thirty seconds. However, their extremely small legs are weak and unable to support their weight properly, thus making hummingbirds unable to balance themselves when on the ground. Because of this, they cannot walk or hop like other birds.

EGO - ANIMAL AS A PERSON

Colours
The colours of the hummingbirds' feathers vary, depending on their species and gender.

Size
Their size varies, depending on the species.

Weight
The smallest type weighs approximately 1,8g. and the largest 20g.

Male-Female
They differ on their colours and size. In the larger hummingbird species the male is bigger than the female, while in smallest species the opposite occurs.

How many species of hummingbirds exist?
There are at least 343 species of hummingbirds found in the world.

Where do hummingbirds live?
Hummingbirds can be found in North and South America. Depending on their species, they choose to inhabit gardens, valleys, small mountains, deserts, coastal areas, or the edge of the woods.

What is the social behaviour of hummingbirds?
Hummingbirds usually live alone throughout the year, with the exception of mating seasons, during which the males perform a series of displays in order to attract the females' attention. Such displays include a U-shaped dive, which is repeated until the female responds to it. Hummingbirds also tend to be aggressive, especially when it comes to protecting their nests and food from invaders.

ADAPTATION

How do hummingbirds manage to adapt to their habitats, according to their needs?
Hummingbirds close their colourful wings in order to adapt to their surroundings. Furthermore, they have the ability to adjust their metabolism when they cannot find enough food as well as to control their heartbeat and body temperature.

VOICE UNIQUE CHARACTERISTICS

Can hummingbirds sing?
Each hummingbird species has its own song and chirp. However, the humming sound created from the fast beating of their tail and wings is also remarkable.

ECOSYSTEM - SOUNDSCAPE BALANCE

Ecosystem Balance

How do hummingbirds help maintain ecological balance?
Hummingbirds transfer pollen that sticks to their beaks when they sip nectar from flowers, thus contributing to the pollination of flowers and other types of plants.

Soundscape Balance

Hummingbirds contribute chirping, ticking and other sounds as they vocalize to defend their territory, to attract the attention of possible mates etc. They also contribute to soundscape diversity through the buzzing sounds of their fast moving wings. (You may listen to some sounds here: *The Sounds of Hummingbirds.* Retrieved from this site >and on this video: UCLA. (2016, Dec 12). *The Hummingbird Whisperer*. [Video file]. Retrieved from: This site > .

RELATION TO HUMANS

Do hummingbirds decorate their homes?
Hummingbirds put dead leaves and lichens in their nests.
Similarly, humans decorate their homes with a variety of objects.

Do hummingbirds change colour?

Hummingbirds are born naked and their wings are grey when they are initially acquired. Approximately 18 days afterwards, each bird (depending on the species and gender) acquires its own colours in its wings and body.
In the case of humans, eye colour can change, especially in the first months of life.

How are baby hummingbirds fed?
Mother hummingbirds regurgitate an amount of nutritious food they consume, in order to feed their babies. Human mothers breastfeed their babies.

What do hummingbirds eat?
Hummingbirds feed on flower nectar, which contains the amount of sugar and water that is necessary for their survival. Moreover, they feed on pollen, insects and spiders in order to receive the protein they need. Hummingbirds can eat up to three times their weight daily in order to obtain the required energy to flap their wings.
Like hummingbirds, humans consume a variety of foods in order to gain the nutrients that are needed for the sufficient function of their organism, but they eat much less than hummingbirds in relation to their body weight.

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Images

Source: Image by Joseph C. Boone. Retrieved from:
this web site >

ANIMAL: LUTRA-LUTRA

Genus: Lutra **Species:** Lutra lutra (Eurasian otter)
Approached through the model B.E.A.V.E.R. (Etmektsoglou, 2018)

Authors: Eva Mavroeidi, Andrianna Neamoniti, Marina Papageorgiou
Supervisor: Ioanna Etmektsoglou

BEST IN:

Fast movement in water and land:
L. lutra are excellent swimmers! When swimming slowly or just floating, they use all four feet. When swimming fast, the whole body moves up and down, including the tail, while the hind feet are used for steering.
They swim as fast as 47 kilometers per hour. They also slide on ice and snow.

Excellent space organizers!
In addition to building their home (den) by the water, with one entrance often being under water and the other on the land, Eurasian Otters (L. lutra) also designate particular spaces for specific uses: *Rolling places*, where they can roll on the ground and groom themselves, *Slides*, on sloping riverbanks, for sliding into the water fast, *Runways*, paths that connect their facilities and lead to the water, *Spraint stations*, where they defecate, a *Territory*, which they mark with their scent and defend against intruders, and a *Home Range*, a larger area, which they may visit daily or during different seasons of the year. Home Ranges are usually quite large. For example in Sweden, the length of home ranges is about 15 km for the male and 7 km for the female L. lutra.

Hearing for sensing danger
L. lutra has very good hearing. According to some scientists, hearing is more important for them than smell in sensing danger.

EGO- ANIMAL AS A PERSON

Territory defense
They defend their territory by marking, scratching and only occasionally by fighting.

Sliding to play or to get there faster?
Some scientists think that for Eurasian otters, sliding is a form of play, whilst others think that they slide to get into the riverbank faster, without wasting much energy.

Playing before mating
Before copulating, the male and female play vigorously, swimming, chasing each other, diving in the water, twisting, etc.

Taking care of the pups
All female otters defend their young pups against intruders, even by using aggression.
Freshwater otter pups are born blind, without teeth and practically immobile. They spend their first few weeks of life in their dens, being nursed and sleeping.

ADAPTATION

Hearing in the water
Eurasian otters cannot hear very well when their ears are in the water, so they use their whiskers (vibrissae) to 'hear' their prey moving.
When they swim underwater, their ears are automatically covered by a special valve.

The two-door home
They build their den with two entrances, one in the water and the other on land. In this way they can have a safe place, with easy access to the two habitats, which they depend on for finding their food.

Whistling like a bird
A melodious whistle can be heard over hundreds of meters away (Kruuk, 1995). While a lower sound could be more easily masked by the sounds of water and vegetation in the Eurasian otter's habitat, the whistle may stand out. It is thus a good adaptation to the environment.

VOICE UNIQUE CHARACTERISTICS

Vocal sounds
They produce a variety of vocalizations from quite high whistles to low sounds such as:

- *Melodious whistles:* common call, carries over hundreds of meters away
- *Loud whistles:* indicates uneasiness, used by mother – pups in distance
- *Soft whistles:* contact call between 2 pups in close proximity
- *Low cooing sounds:* Murmur, as greeting between mother-young after short time of separation
- *"Huff" sounds or "Blow" sounds*: Quick exhalation of air or noisy blow, when alarmed by the presence of humans or predators
- *Whickering:* alarm call towards intruder in its territory
- *"Caterwauling":* When cornered during a fight
- *Aggressive cries:* frequencies above 16kHz, uttered in close proximity (less than 1 meter) or during physical contact, in quarrels for food or territory.

(Hung & Law, 2016)

Non-Vocal sounds
They also produce sounds as they swim, move around the riverbanks, walk, run, slide, break shells with a stone etc.

ECOSYSTEM BALANCE

Food variety
The diet of Lutra lutra is characterized by variety, but depends a great deal on the availability of food in its particular habitat. It may include fish, amphibians, birds, small mammals and aquatic invertebrates (Kruuk 2006). The Northern European *L. lutra* relies more on fish for its diet, whilst the Mediterranean *L. lutra* relies less on fish and more on aquatic invertebrates and reptiles (Clavero et al. 2003 in Hung & Law 2016).

Few non-human predators

Wolves, birds of prey and large reptiles may prey on ill, very young or very old L. lutra, while the healthy adults do not have any predators.

Anthropogenic threats:

L. lutra is affected by human activities, such as land or river pollution, habitat destruction, hunting.

- Contamination from crude oil may cause death. When 30% of the Eurasian Otters' fur becomes soiled, it loses its insulating capacity and the animal may die in short time from hypothermia.
- "Organochlorines dieldrin (HEOD) and DDT/DDE, PCBs, and mercury are the main pollutants that pose a danger to *L. lutra* in Western and Central Europe" (Roos et al. 2015 in Hung & Law 2016, p. 118).
- Anthropogenic habitat alterations —including mining, construction of river canals, dams, and aquacultures, and habitat degradation through drainage of wetlands and removal of [wetlands]—are all detrimental to *L. lutra* populations (Mucci et al. 2010, in Hung & Law 2016, p. 118).
- *The L. lutra* is occasionally accidentally caught in traps and cages meant for other species such as musk-rats (*Ondatra zibethicus*) as well as hit by vehicles on the road (Madsen and Prang 2001, in Hung & Law 2016, p. 118).

Soundscape Balance

They produce a variety of vocalizations from fairly high whistles to low sounds. They also produce sounds as they swim, move around the riverbanks, break shells with a stone, slide downhill etc. If they were to become extinct, this particular variety of sounds would be eliminated from the soundscape. …

RELATION TO HUMANS

Eurasian Otters are Mammals like humans. The female is pregnant for about two months and then usually gives birth from one to three pups. It can become pregnant twice a year. Pups drink their mother's milk, which is 24% fat, and they nurse every three to four hours, as human babies tend to do. However, while Eurasian Otter pups are fully weaned when they are 14 weeks old and can swim and dive to catch their own food by the time they are four months old, human babies are dependent on their parents for food for much longer.

Both Eurasian Otters and humans have outer ears, but the ears of Eurasian Otters have a valve which closes them when in the water, whilst humans don't. Eurasian Otters have natural earplugs!

Besides their nest (den), Eurasian Otters organize the space of their territory, assigning specific places for certain activities. One can compare this to the organization of living space by humans in old farms and in modern city apartments and neighbourhoods.

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https://seaworld.org/en/animal-info/animal-infobooks/otters/birth-and-care-of-young [Accessed: 12/5/2018]
https://www.iucn.org/resources/conservation-tools/iucn-red-list-threatened-species [Accessed: 12/5/2018]

Audiovisual Resources

International Otter Survival Fund Website, also includes an audio sample of L. lutra vocalizations >.
Video by the International Otter Survival Fund >.
Great Nature Watch Otter Sound. Video by the Canal & River Trust > .
Otter Lutra lutra: The Trilling in a Presence of a Familiar Keeper (sound file) >

Images

Image by Bernard Landgraf. Retrieved on 4/6/2018 from:
this web site >

Image by Dave Pape. Retrieved on 5/6/2019 from:
this web site >

II. Practical Applications by Postgraduate Students and Music Teachers

Project 1: ‘Mastiha’: Recording a traditional song using sampled sounds to resemble sounds of musical instruments
Creator: Marios Skamnelos, Music Educator (MA Music Education)

Aims:

- ✔ to familiarize the students with the sonic characteristics of specific musical instruments
- ✔ to search for similar characteristics in natural sound-sources resembling these instruments and use them musically
- ✔ to listen carefully to the sounds from their everyday environment
- ✔ to reproduce a song using sounds from alternative sound-sources
- ✔ to develop their observation skills, critical thinking, free expression, and improvisation skills
- ✔ to foster creativity and co-operation

Context of Application:
The project included students from a local conservatoire, the Center for Creative Employment of Children and children from the family environment of the music educator. Overall, it lasted for 7 months.

Age	2-17 years old
Number of participants	20
Materials	Musical instruments, sound recorder, Logic Pro software, computer, mobile phone

Description:

Stage 1:
The traditional song was recorded on the Logic Pro Digital Audio Workstation using sounds of musical instruments from its pre-set instruments’ library. Students used this recording as a model to explore and produce the sounds, which later replaced the sounds of the original instruments. It was necessary to have at least one representative instrument from the following categories: wind, percussion, string and keyboard. Thus, the instruments used for the recording were a recorder (flute), a bass, a drum set and a piano.

Stage 2:
The students were asked to listen to the recording and observe the characteristics of the sound of each instrument. They also received additional information about the song and its origins. The sonic properties of each instrument were examined in sessions that followed. More specifically, students learned that the recorder (flute) belongs to the category of woodwinds. The sound of the instrument is produced by blowing, and its volume depends on the 'force' of the blow (Chadelis, 1992). As for the bass, the students were introduced to the family of strings and their sound-producing mechanism: moving or hitting the bow on the strings (arco) as well as plucking with the fingers (pizzicato). Students were informed that the drum set consists of the bass drum, which they found has a ‘low and heavy’ sound, the snare drum, which has a ‘high and sharp’ sound, and the cymbals as well as hi-hats, which have a "metallic" sound. The set of these percussion instruments have an uncertain pitch, in contrast to the rest of the musical instruments selected for this project. The piano is a keyboard string instrument. The sound is produced when hammers hit the strings and fades slowly or quickly depending on the pitch height (Benade, 2012).

Stage 3:
Students were encouraged to search for the sound sources that would replace the instruments of the original recording and proceed to specific choices. Students immediately linked whistling to flute sound. Most students tried to whistle and to reach the pitch given by the recorder (flute). Students suggested an alternative way of producing a similar sound to the bass by plucking an elastic band. While experimenting,

they realized that the more the elastic band is stretched the higher is the pitch. To replace the bass drum students suggested beating a carton box. Hand clapping replaced the sound of the snare-drum and hand-made maracas created in class using bottle caps and rice grains, replaced the sound of the hi-hat. The students also reproduced the basic rhythm pattern of the song after having been taught how the beat works in a song. It is worth mentioning that a new sound was randomly discovered when a student of 3 years of age, broke a plate in front of the microphone. The students decided that this sound could be used to replace the sound of the crash cymbal. Students had difficulty in suggesting alternative sounds for the piano. What solved the problem was hitting a glass filled with water with a metallic object. Students observed that the pitch got lower as the glass filled up.

Stage 4:
All alternative sounds, which replaced the sounds of the instruments, were sampled using a digital recorder (Zoom H4Npro). Sampling took place on a single pitch using a pitch-measuring app on a smart phone, with the exception of the sounds that replaced those of the drum-set. Using the Logic Pro, the sound samples were mapped to the sampler, replacing the sounds of the original instrumentation. Additionally, an extra sound was added after a student suggested improvising on a wooden desk following the rhythm of nine eighths of the original song. A joint improvisation took place, was recorded and added to the end of the recording, thus completing the track.

Creator's general notes:
The same project could be carried out with many groups from different places, with each group using the soundmarks of their region, leading to the creation of a 'poly-soundmark' song.

Documentation:
The project is published at this site > .
(last update on 29/06/2019).

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Marios Skamnelos *is a graduate of the Department of Nursing and the Department of Folk and Traditional Music of the Technological Educational Institute of Epirus (TEI), in Greece, with a specialty in the accordion. He also holds a degree in accordion and a diploma in Music Theory and Counterpoint. Since 2010 he has been teaching music in state schools and private conservatoires. He holds a Master's Degree in Music Education from the Department of Music Studies at the Ionian University, Greece. This raised his interest in researching alternative forms of teaching music. He is also an active music performer and participant in record productions.*

Project 2: Crazy and incredible sounds around us
Creator: Savvani Aggeliki, Music Educator in Secondary education

Aims:

- ✔ to foster students' listening skills
- ✔ to cultivate respect for the environment
- ✔ to come in touch with nature through its sounds
- ✔ to make them aware of the relation between music and the environment
- ✔ to develop through sound production cooperation, responsibility, discipline and communication, skills important for their socialization
- ✔ to learn to accept and respect the other students' work
- ✔ to interact with the environment which is rich in music stimuli and to experiment with sounds actively and creatively
- ✔ to learn basic concepts of Acoustic Ecology

Context of Application:
In the project 'Crazy and incredible sounds around us' we refer to the sounds produced and created in a forest from animals, wind, rain, plants, trees and humans. It took place during the school year 2018-2019 as part of an environmental programme in a secondary school class in the Prefecture of Achaia, Greece. During our visit to the Centre of Environmental Education of Sikyonion (Prefecture of Corinthia), we hiked in the Velina forest in the Peloponnese, focusing on the sounds around us. Also in class, the students produced various sounds with metal objects, which they collected themselves being imaginative and inventive in the process. This project could be part of school music lessons as well as part of the week dedicated to various themes in Secondary Education.

Activity 1: Talking with the forest

Age	13-15 years old
Number of participants	15
Objectives	to become aware of the sounds in the forest and nature in general to become aware of the relation between music and the environment
Materials	music player, computer, wood, stones, mobile phone

Procedure:

During the hike, students following each other produced sounds with their steps on the ground as well as on dry leaves. Initially, we focused only on our steps and then we split into three groups. The first group created sounds by taking wood from the environment and hitting these pieces of wood against each other. The second group created sounds by hitting stones and wood on tree trunks. The third group rubbed their hands and leaves together. The composition had a peak point and gradually the sounds were silenced. Also the wind blew through the tall trees of the forest creating a delicate soft sound. A student had been assigned to record this activity. At the end of this, all the participants listened to the recording and talked about the sounds that were produced and especially the sounds of nature. What especially impressed all participants was the sounds of the wind.

Activity 2: Sound games with metals

Age	13-15 years old
Number of participants	15
Objectives	To experiment with the metallic objects which they chose To develop cooperation, responsibility, discipline and communication through collective sound production
Materials	Mobile phone, computer, metallic objects

Procedure:

Stage 1:
The students formed a circle in the classroom. Initially there was a sound produced by maracas that signalled the beginning of an exercise in silence for a few minutes. Absolute silence prevailed in the room.
Stage 2:
The students brought metal objects from their homes, the sound of which was of particular interest to them. They were given a specific rhythmic pattern and used the metal objects one at a time presenting their alternative instruments. Gradually sounds were combined and complemented each other. Then the students abandoned the initial rhythmic pattern and improvised freely. A student video-recorded this activity. In the end all participants listened to the recording.
Stage 3:
A discussion followed and each student expressed their opinion on which object produced the most impressive and interesting sound. They noticed and pointed out the importance of silence, as opposed to all other metallic instruments. They commented on the fact that during the silence there were tiny sounds around them, which they did not observe during their day at school (e.g. bird singing, chair creaking, wind blowing through the window, etc.) because they were covered from the louder sounds of their daily routine. They also referred to emotions that arose during this activity: pleasure, satisfaction, enthusiasm, joy, pride for what they experienced in the classroom.

Creator's general notes:
Recordings and video-recordings were realized with a mobile phone as we did not have any other recording equipment in our school. There was also no processing of the sounds as our goal was to discover the uniqueness and authenticity of the sounds around us.

Aggeliki Savvani *is a music teacher in secondary education in Greece and has been teaching since 1990. She has participated in many seminars and has been educated in group empowerment play. She organizes various interdisciplinary projects with students including environmental education, e-twinning, cultural heritage and sustainable development, with the aim of motivating students to be informed and involved in actions that will make them develop their environmental consciousness.*

Project 3: Fairy tale soundscapes: Narration and listening with the 'ear' of acoustic ecology
Creator: Maria Halkiadaki, Educator in Primary Education (Special Education, MA in Music Education)

Aims:

Cognitive

- ✔ To make participants familiar with basic concepts of acoustic ecology.
- ✔ To make them familiar with musical concepts (duration, volume, dynamics, timbre, sound qualities)
- ✔ To make them familiar with and work with the soundscapes of ecosystems

Affective

- ✔ To be ecologically informed about the sounds that are disappearing, human intervention and the consequences of any changes, both natural and human, on ecosystems
- ✔ To understand that there are sounds in our everyday life that we are not aware of because they are masked by stronger sounds
- ✔ To realize the importance of silence and especially of pause in music
- ✔ To think musically acknowledging the interaction of sounds

Psychomotor

- ✔ To reflect on how soundscapes change due to human and natural interventions
- ✔ To create soundscapes portraying specific environments for fairy tales
- ✔ To practice listening more consciously and critically

Context of Application:
The project was based on the participants' needs, who were volunteer readers of the "Reading for Others Network". The topic was the sounds of fairy tales and the way a reader can enrich reading and story telling by focusing on the sounds that make up its soundscape. It was part of a seminar course with various themes (narrative, play, music games, theatre and puppet techniques, traditional fairy tales, fairy-tale philosophy, improvised games and musical instruments) for readers' training. It lasted for three hours and included research, experimentation, recording and listening. It took place in a building at the centre of Heraklion, Crete, Greece. Part of the project took place outside, in the square of St. Titos, in the city centre. The participants were adults of different ages, nationalities and professions.

Age	≥18
Number of participants	12
Materials	a laptop, a pair of speakers, a sound recorder, (Tascam-DR 05), paper forms for listing the sound sources, pencils, small percussions, glass jars, plastic, lids, feathers, nuts, dry shells, branches, dried leaves, metallic objects

Description:

Stage 1 – Listening and sound recording of the soundscape
The team came out of the meeting room, walked towards the city centre, which is about 5 minutes away. Some participants recorded the whole route using a recording machine and mobile phones. We chose a spot (St. Titos Square) where we could sit, listen and record sounds. The participants had 5 minutes to record and list as many sounds as possible from the environment on a piece of paper. Some participants had their

eyes open and some closed (the group that had closed eyes wrote afterwards). We returned to the building and commented on our notes and listened to the recordings. It was interesting that there were differences in what each participant heard, what they felt was important to write, and how much they remembered listening after the team mentioned their sounds. It was also impressive that no one had listened to some of the recorded sounds. It was suggested that there were primary sounds and sounds masked by others (foreground and background). As we stood at a different place on the square, we realized that each one of us perceived the characteristics of the sounds differently.

Stage 2 – Theoretical framework
The theoretical part concerned acoustic ecology as a science, M.R. Schafer, his ideas and specific terms (soundmark, sound event, sound signal, sound diversity, noise pollution). The soundscape was related as a concept to the ecosystem. The team received a brochure with the most important information and terms. They were informed about the sciences to which acoustic ecology is related and a special reference was made to music and soundscape compositions. It was followed by a discussion on the soundscape, its balance and the way it can be used in storytelling.

Stage 3 – Investigation and experimentation
The team was encouraged to think of various places as soundscapes. In groups (3 groups of four people), the participants chose a forest, a beach and a Christmas evening at home. They searched for the sounds that could be heard there and wrote them down. We talked about which of these would be foreground sounds and which background sounds, and according to that, what their volume and duration would be. Which sounds would just be a sound event and which a sound signal? Was there a soundmark? How might the meanings assigned to these sounds change if something sudden happened in the soundscape? At this stage, we dealt with the fairy tales. The participants thought of various fairy tales and stories, both popular and less known, chose a scene from a fairy tale and tried, as before, to imagine what sounds could make its soundscape. The participants had the chance to think how other living organisms living there would perceive these sounds. Then, they experimented with sound producing objects and small musical instruments exploring the qualities of the sounds, volume, duration and timbre. It was a long activity and gradually the participants associated the materials with the sounds of their soundscape. They also used the voice and body percussion.

Stage 4 – Composition
Each group presented a short, simple story without any words, only with sounds. In particular, they had to create a soundscape and then 'experiment' with the balances of the sounds by adding and erasing sounds so that the listener could understand the space, the time and the story. The participants made their stories (a story on steep cliffs by the beach where seagulls fly, one with a woodcutter working in a forest during the winter, and one in the living room of a house on Christmas Eve). The whole process was recorded and then each group listened to all compositions again on which they then commented. There were very creative and inventive ideas and it was said that these soundscapes could be described as music, although there was not any melody or rhythmic patterns.

Stage 5 – Discussion and suggestions for activities and games when reading with children
At this stage the participants were given time to briefly refer to sound related activities for children. The team was extremely creative, had ideas for activities and games.

Creator's general notes:
It was a very interesting experience for everyone and the participants showed great interest and a deeper need to approach acoustic ecology. The project finished with the participants requesting to receive a more complete and deeper approach to the topic by experts in the field.

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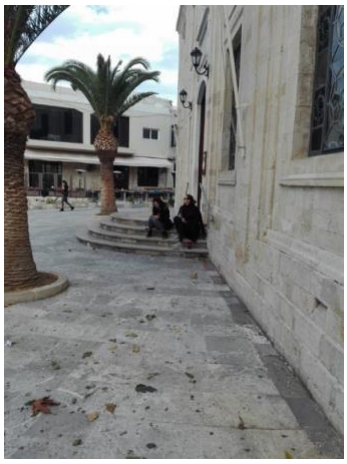
Maria Chalkiadaki *is a primary school teacher and a trained Special Education teacher having completed the programme at the Teaching School of the University of Crete in Rethymno, Greece. She works in Heraklion, Crete. She has studied classical guitar. She is a graduate of Carl Orff's music education programme at the Moraitis School, Greece. She has completed the postgraduate programme in Music Education at the Department of Music Studies of Ionian University, Greece. She participates in actions for music and children, in music educational groups for teacher training as well as in art groups for people with disabilities.*

Photos:



Listening to the city….


Sound-researching and sound-creating….

Project 4: The Tree Whisper
Creator: Evaggelia Tsaousidou, Music Educator (MA Music Education)

Aims:

- ✔ To raise students' acoustic and environmental consciousness
- ✔ To develop their active listening through contact with the wind as a natural phenomenon, the ontological existence of the trees and the result of the interaction between them (leaves rustling)
- ✔ To cultivate and refine the auditory system, through its activation in the low energy level of whispering/rustling sounds
- ✔ To develop students' aesthetic and sensory perception through deepening of the contact between the person and the environment
- ✔ To develop a multifaceted embodied-creative perception through contact with sound and nature
- ✔ To develop practical knowledge about the natural environment and its elements, such as trees, plants and natural phenomena and draw their attention to the various possibilities of using their sounds creatively

Context of Application:
The project was carried out by a group of three final grade secondary classes as extra-curricular activities in a four-month period (November-February 2018), in the Preveza region. The first three months were dedicated to recordings, which took place in areas near the homes of the participants. During the fourth month, a meeting and group activities took place in a room.

Age	9+
Number of participants	3-8
Materials	Digital recorder, photo camera, mobile phones, laptop, paper, pieces of cards in different sizes, glass bottle

Description:
This activity involves listening and recording the rustling leaves of various trees. Participants' attention is primarily focused on the sound of the rustling leaves and to the aural differentiation of the timbre of each foliage. The wind causes the rustling of the leaves and the sound produced is similar in dynamics and quality (timbre) to human whispering, 20 dB, (Sound and Nature, 2005), a sound which tends to disappear as a functional element in human expression and communication. Therefore, the links between sounds and the way they are produced in nature become evident, as well as between sounds produced by humans and those resulting from environmental processes.

Meeting 1: Listening to the recordings and actions in groups
The participants met after they had all completed their recordings. They exchanged their views on the process and on the recordings of the soundscapes, which they listened to through technological devices which they combined with relevant photographs. The presentations were carried out on a laptop with connected external speakers, which contributed to a sharper audio and visual performance. The presentations also contained relevant information on the content of the recordings.

Activity 1: Active listening of recorded soundscapes
Students played all the recordings again and listened to them with closed eyes.

Activity 2: Aural recognition of soundscapes
Students tried to recognize the soundscape of each tree, without the help of the picture, by only listening to its sound.

Activity 3: Sonic exploration and improvisation

Students imitated the sounds of the wind and leaves rustling using the voice and various simple materials (A4 paper, pieces of cards in various sizes, glass bottle):

a) Sound exploration of materials and then creation of an imaginary soundscape, with strong wind and different leaves rustling sounds in free sonic improvisation.
b) Semi-structured improvisation, which starts with breathing (the air of breathing in and breathing out), whispers on a given topic (story) and quiet rustling sounds, progressing to the climax and then fading away.

In the last stage, students reflect on the overall process and experience. They extend the activity to further sound exploration, creating a new cycle of listening about plants. They carry out another challenge: they listen focusing their attention on the roots of the plants and the sound produced during watering.

Suggested sources

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Evaggelia Tsaousidou *is a Music Educator at the 'Creative Activities Center' and in Music Institutions in Greece. She teaches music to preschool children and first grades of primary school with in a combination with other arts, like painting, puppet theatre and dramatical games, aiming at a multidimensional and imaginative music and aesthetic education. She is exploring the role of free music improvisation in the cultivation of active listening, artfulness and broader musicality in children, considering also the importance of interpersonal contact and communication between teacher and student.*

Photos:



Project 5: Composition as a means of Creative Expression through Acoustic Ecology
Creator: Kassiani Ritou, Music Educator in Secondary School, MA in Music Education

Aims:

- ✔ To develop students' research skills
- ✔ To promote digital literacy through the use of new technologies
- ✔ To process information critically
- ✔ To promote learning through creativity and a holistic approach to knowledge
- ✔ To develop group working and collaboration
- ✔ To foster awareness of the environment
- ✔ To introduce the students to Acoustic Ecology

Context of Application:
The project was developed at the Music School of Larissa, a city in Greece, during the school year 2016-2017 and it lasted for five months. In the 1st month, a meeting was held to research the topic, set subtopics, arrange groups and allocate work. In the 2nd month the groups searched for material about Acoustic Ecology in the school library and other sources as well as the Internet. The teachers who were in charge helped the students so that the topic could be approached through appropriate literature. In the 3rd month the students created their original musical works, which they then recorded. In the 4th month a training seminar was organized with graduates of the school who were studying composition at university. In the 5th month the project was presented at the Festival of New Technologies under the direction of the School Activities Organization. Two high school students decided to compose a sound story with sounds from the environment, inspired by the information they received on Acoustic Ecology and soundscape composition. The composition was titled 6.03' because it lasts for 6 minutes and 3 seconds. It took six meetings in total for the students to complete their work and record it. The choice of sounds was based on the sound story. The on-site recordings were adapted to the story that the students themselves wrote.

Activity

Sound story 6.03'

Age	15-17 years old
Number of participants	2
Materials	Printed and digital material on acoustic ecology, computer, mobile phone

Description

The sound story seems to join two separate soundscapes. One soundscape has been created inside the house (with sounds of the door, wood burning in the fireplace, phone ringing, piano tunes, the festive table with cutlery and human voices with wishes) and could be called an inner soundscape. The other soundscape could be seen in contrast to the first, and is called the external soundscape, because the sounds that can be heard are sounds of nature outside the house (wind blowing, rain, puppies, cars). The linking sound between the two soundscapes is the unlocking of the door that takes us inside from outside and back to the outer soundscape again. It works as a bridge in the musical composition and shapes the structure of the sound story.
In particular, the analysis of the sounds in the composition according to Krause's (2012) sound classification in anthro[po]phonic, geophonic and biophonic (or anthropophony-geophony-biophony), could be as follows:
0.01-0.20: wind blowing (geophony)
0.20-0.52: wind and rain (geophony)
0.53: door opening (anthropophony)
0.55: wood burning in the fire (anthropophony, sounds with human influence)
1.06-1.43: piano and phone dialogue (anthropophony)

1.44-2.27: solo piano composition (anthropophony)
2.28-2.44: rhythmic blows (anthropophony)
2.45-3.47: rhythmic blows and piano (anthropophony)
3.48-4.04: puppies (biophony)
4.04-4.13: door unlocking, creaking and closing (anthropophony)
4.14-4.28: speeches, cutlery (anthropophony)

At this point, sounds can be distinguished into Background Sounds and Foreground or Surface Sounds (Schafer 1994/1977; Etmektsoglou, 2014). Specifically, as Background Sounds we have marked the point where human speeches can be vaguely heard in the background. As Foreground Sounds we have marked the point in the composition where the word "cheers" can be heard. This specific sound is at the centre of our hearing perception.
4.29-4.32: piano and speeches (the foreground sound is the piano and background sounds is the conversation)
4.33-5.31: piano composition (foreground sound without background)
5.32-5.40: door unlocking and creaking (foreground sound without background)
5.41-5.51: puppies (foreground sound without background)
5.52-6.03: cars (background sound that becomes foreground sound and then background sound again)

References

Etmektsoglou, I. (2014). Vasiki Orologia Akoustikis Oikologias gia Paidia kai Enilikes: To Ichotopio kai oi Simasies ton Ichon tou [Basic Terminology of Acoustic Ecology for Children and Adults: The Soundscape and the meanings of its Sounds]. Corfu: Hellenic Society of Acoustic Ecology. Retrieved on 29/12/2017 from this link >

Krause, B. (2012). *The Great Animal Orchestra: Finding the Origins of Music in the World's Wild Places*. London: Profile Books.

Schafer, R. M. (1994/1977). *The Soundscape: Our Sonic Environment and the Tuning of the World*. Rochester, Vermont: Destiny Books.

Kassiani Ritou *holds a Bachelor in Music Education and a Master in Music Education from the Music Department of the Ionian University, Greece. She holds a diploma in Music Theory from the Larissa Music Conservatoire (class J. Grampsas) and a diploma in flute from the Contemporary Conservatory of Thessaloniki (class V. Belomazhov). She has attended seminars and masterclasses with Othonas Gkogkas, Maria Kinigou-Flamboura, Lisa Nelsen, Peter Seymour, Joseph Moreno, Maria Guinand and others. She has worked as a music educator in state primary schools and in private education. She currently teaches flute at the Music Secondary School of Larissa.*

Project 6: In the open-air market, baskets-trolleys
Creator: Dimitra Kotsopoulou, Kindergarten Teacher (MA Music Education)

Aims:

- ✔ to make students familiar with silence in the context of listening to certain sounds
- ✔ to enhance their listening skills by recognizing different sounds
- ✔ to produce sounds with their body using their imagination, imitating various situations
- ✔ to develop co-operative skills and team spirit
- ✔ to make them familiar with new terms such as sound, volume, hearing, listening, soundscape, listening walk or soundwalk

Context of Application:
The project took place in a kindergarten classroom with 17 students during the school year 2017-18 and lasted for 2 weeks. The school is in Larissa, Greece, and is next to the street where the open-air market is found. This means that the soundscape of the open-air market was familiar to the students and something that was useful for their socialization and awareness of the wider school environment.

Activity

Age	4 - 6 years old
Number of participants	15-20
Materials	sound recorder, pencils, keys, plastic and aluminum caps

Description:

Session 1: Natural and Artificial Sounds
The aim of this meeting is to understand the concept of sound and the distinction of sound sources as natural or artificial. We ask the students to identify the various sounds that are currently heard in the classroom (from the school playground, other classes, etc.). They then try to produce sounds with their own body. In the afternoon, and with the assistance of their parents at home, they record the sounds they hear over a 5-minute period on paper.

Session 2: Hear, listen, the soundscape.
We read the identified sounds from the previous day and then explain the words hear, listen, and soundscape to the children. We ask the students to mention the kinds of soundscapes they know. Next, we improvise with some of the soundscapes just described.

Session 3: Volume, Composition
Using the keys of our school classroom and two lids (a plastic one and an aluminum one), students become familiar with the concept of volume. First we throw the keys on the floor, then on the plastic cap and then on the aluminum cap. We ask students to scale the loudness (volume) of the sound produced from each throw from 1 to 3 and write the number next to each word that the respective material represents (floor, plastic, aluminum). They then come to the class board and write their own composition, for example: 1-3-1-2-3-2. Finally, the group performs the composition using the above materials.

Session 4: Soundscape
We organize a soundwalk to record the soundscape of our school on the day of the open-air market. Before we begin, we agree that we need to remain silent throughout the soundwalk, so that we can listen carefully. As we begin, one of the students who holds the recorder turns it on. We walk through the open-air market, recording all the sounds. Then we return to our classroom where the rule of silence can now be broken.

Session 5: We listen to the recording of the soundwalk and write everything we heard on a piece of paper. Then we map the soundwalk in every detail. We start from the school, both inside and outside, and then we draw the path we followed. We draw the points with the main sound sources.

Session 6: Reproduction of the Soundtrack - Sound Composition in the Classroom
Students chose their sound extracts from the recording of the soundwalk we heard in the previous session and the soundwalk map we had created. Students then reproduce the sounds, creating a sound composition that represents the soundscape they had done. Students become sales people in the open-air market hawking their products. This way their auditory memory is developed whilst using their voice as an expressive tool and as a means of communication.

General notes by the creator:

As an extension of the above activities, a different composition could be created, including the sounds of the bags in which the food is put and the sounds of the trolley where the bags are placed, combined with children's speech.

Dimitra Kotsopoulou *is a graduate of the School of Early Childhood Education of the Aristotle University of Thessaloniki in Greece and holds a postgraduate certificate of the MA programme of Music Education at the Ionian University. She speaks English and French. She studied at the Municipal Conservatoire of Larissa and attended the program of Carl Orff & Dalcroze at the Moraitis School, Greece. She is a member of the* Indonnation *choir. She has been working as a music teacher in Primary Schools since 2000. Together with her students from the Music School of Larissa, she has performed in various concerts [dimkotso@gmail.com].*

Photos:


Picture 1a,1b: Volume

Picture 2: Composition

Picture 3: The soundwalk

Picture 4: Map of the Soundwalk

APPENDIX IV

"Summer Academies" on Acoustic Ecology held at the Ionian University

Report by **Zoe Dionyssiou**

During the three-year project "The soundscape which we live in" at the Ionian University, Department of Music Studies, we organised and hosted two Summer Academies related to the field of Acoustic Ecology.

A. Summer Academy 2017 "Acoustic Ecology"

In 2017, between July 8 and 12, we ran the five-day Summer Academy "Acoustic Ecology". Invited educators were: Carole de Haut-Darwiche (GMVL, Groupe Musiques Vivantes de Lyon- France), Katerina Tzedaki (Department of Music Technology and Acoustics, Hellenic Mediterranean University), Aimilia Karapostoli (Architect), Ioanna Etmektsoglou (Department of Music Studies, Ionian University), Andreas Mniestris (Department of Music Studies, Ionian University), Zoe Dionyssiou (Department of Music Studies, Ionian University), and Dimitris Sarris (Music teacher in Primary Education, Prefecture of Messinia).

Snapshot of students gathering at the the seminar area
at the Environmental Education Center of Lefkimi

Topics and research data about Acoustic Ecology were examined in the following three areas: a) Sound, Environment, Communication, b) Acoustic Ecology and Education, c) Soundscape: Listening, recording, composing. More specifically, the themes of the Summer Academy were formed as:

- Sound and public space.
- Sound communication among people and other beings
- The use of environmental sounds in modern music education
- The approach of soundscape through modern music creation.
- Sociological and ethnographic issues about the sound
- Sounds, environment and educational approaches.

Carole de Haut-Darwiche gave a seminar on "Creating an Electroacoustic Composition for Children 3 to 12 years old" and shared her knowledge and experience from her work with young children in schools in France, and how she introduces them to electroacoustic composition. Her pedagogic and artistic program is based on creating sounds from found - usually disposable - objects, on exploring body sounds, on

improvising, recording and composing. In her seminars in Corfu, empirical activities were carried out that introduced participants to various stages of electroacoustic music composition or were related to the process of deep listening.

Katerina Tzedaki introduced the participants to the "Soundwalk", leading some soundwalks in the Old Fortress, Corfu town and the Mon Repos garden. Through the practice of the soundwalk the participants had the opportunity to better understand the hidden sounds of our everyday life. They also had the opportunity to discover that all sounds, pleasant or disturbing, coming from natural sources or technological and mechanic sources, apart from indications of environmental activity, are part of a perpetual musical composition, in which all people are involved in various ways. The objectives of the practice of the soundwalk for the participants were: to increase concentration and attention, to enhance musical memory, to develop the ability to change focus on different sound stimuli, the experiential understanding of environmental diversity and the conscious, creative listening.

Ioanna Etmektsoglou, presented three workshops, in the first, titled "Sounds and Stories as a Means for Environmental Education", she introduced the participants to various sounds which animals use to communicate and to their sound production and hearing mechanisms; to the perceptual skills and the specific hearing ranges of different species; to the concepts of sound diversity and biodiversity and their potential inclusion in environmental education; and finally to the development of students' acoustic perception, and the development of incentives to protect the environment. During the second workshop, titled "Sound and Music in Public Areas", she made the participants aware about the negative impact of noise on humans and other living beings and she discussed the rights and obligations of humans, regarding sound production in public spaces. In the third workshop, titled "Sound and Music Games in Nature", she emphasised the ways in which nature may act as the context but also as a source of stimuli for sonic and/or musical games, such as sound improvisations, bird song recognition, guiding oneself through space based only on sonic stimuli etc.

Andreas Mniestris taught a seminar on "Recording Technology" where he presented basic theoretical principles of recording. He talked about audio recording technology and stereo sound techniques in recording both indoors and outdoors. He also discussed different practices and critical listening to recordings.

Zoe Dionyssiou through the seminar "Sociological and Ethnographic Issues of the Sound" introduced participants to the notion of sound as a cultural expression of people in every place and society (traditional and modern). She referred to musical cultures and educational activities which aim to enhance understanding of sound in familiar or non-familiar cultures. All activities took place in the context of developing a methodology for listening to the soundscape and actions that can be taken in music education to support the development of students' interest and awareness about the environment, nature, animals, man, noise, pollution, sustainability, etc.

Emilia Karapostoli in her seminar entitled: "Applications for Improving Acoustic Behaviour and Sound Protection of Schools" informed the participants about the acoustic behaviour and the inadequate sound protection of the school premises. The aim of her workshop was to convey some of the basic guidelines of acoustic architecture and environmental noise protection, as well as to present indicative educational actions for the utilization of the sound protection of schools by teachers and pupils.

Dimitris Sarris, through a tele-workshop entitled "Towards an Audio Education: Practices for a Sound Focused Education", exhibited ways in which the teacher can transform a classroom into an orchestra so that students can enjoy their sound partnerships. (http://literacy.sch.gr/soundeducation).

The Summer Academy of Acoustic Ecology, was organised by the professors from the disciplines of Music Pedagogy and Psychology of Music, with the collaboration of EPHMEE (Laboratory of Electroacoustic Music Research and Applications). It was a collaboration of many scientists in the field of Acoustic Ecology with good results in terms of the exchange of knowledge and good practices. It prompted many music teachers and music students to deal with these issues and apply their own original ideas to education.

B. Summer Academy 2019: "Sound-movement-body-environment: Discovering relationships for enhanced understanding, expression and creation"

In 2019, between June 24th and 27th, we organized a four-day Summer Academy entitled "Sound-Motion-Body-Environment: Discovering Relationships for Enhanced Understanding, Expression and Creation".

The Academy was hosted at the National Gallery – Corfu Branch and the Department of Music Studies, Ionian University. Professors were: Olympia Agalianou (Department of Early Childhood Education, University of Athens), Clare Hall, (Faculty of Education, Monash University Australia), Zoe Dionyssiou (Department of Music Studies, Ionian University) and Ioanna Etmektsoglou, Department of Music Studies, Ionian University). The Summer Academy was dedicated to exploring relationships between sound, movement, body and the environment. The body that listens, hears and moves, learns to relate, to perceive its limits and abilities and to create both individually and collectively, in a context, which through its complexity provides opportunities for knowledge, relationship, expression and creation.

Olympia Agalianou presented a seminar entitled "I look at the sound, I feel the movement: An exploration of correlations by means of the body, as a vehicle". She offered an in-depth exploration of sound and making sense of the sound environment through the use of the body and movement. The aim of the seminar was for the participants to develop a two-way relationship between the body/movement and of sound as a natural phenomenon, which can lead to the deep understanding of natural phenomena, the personal interpretation of art works, the expression and creation through sound and the body. The movement is seen as an interpretative dimension of the sound and the body as a musical instrument.

Clare Hall in her seminar entitled "Deep Listening with Naked Ears: R. M. Schafer's Philosophy and Contemporary Music Pedagogy" talked about the pressing need for communication between people. Music education needs to suggest new ways of multisensory listening. Multi-sensory listening means listening with our ears, eyes and bodies. We play in ways that stimulate the expressive, acoustic and kinaesthetic response to artworks, the environment and each other. Through art play we tune-in to the 'orchestra of the universe' to find qualities and meanings shared between spaces, places and art forms. These techniques promote interdisciplinary ways of working for holistic and expressive art experiences that can be applied to young children, but also to people of all ages.

Zoe Dionyssiou in her seminar: "A Model for Listening to the Acoustic Environment with an Emphasis on Musical Traditions" presented the methodology for listening to the soundscape based on four axes: a) sound as movement, b) sound as a means for sound creation in the classroom (improvisation, composition, soundscape creation, etc.), c) sound as a connection to the environment, and d) sound as a link to culture. Subsequently, the participants explored applications of the above methodology to traditional Greek singing games.

Ioanna Etmektsoglou in her seminar presented the Pedagogical Model BEAVER, which is proposed for an extended sonic and musical approach of a particular animal, based on the scientific and creative exploration of the sounds it produces, as well as the other special features that make it unique. The word BEAVER acts as a mnemonic tool for the application of the model in the following six themes:

Best in…
Ego - Animal as a person
Adaptation to the environment
Voice-unique characteristics
Environmental Balance - Ecosystem & Soundscape
Relation to Humans (similarities & differences)

At the closing ceremony held on Thursday, June 27, 2019, the participants were encouraged to participate in a personal exploration individually and in groups, through guided improvisation and collaborative processes. The Summer Academy was completed with a collective music and movement composition entitled "Corfu-Sound" that took place in the People's Garden (Corfu Municipal Art Gallery).

In an environment of intense creation and creativity, during the Summer Academy of 2019 participants had the opportunity to experience the sound that moves and is moving, to recognize "affinities" with the environment, to appreciate, admire, experience elements of sound and the environment with their body. Through the Summer Academy participants were successfully brought into constant experiential exploration of the multi-faceted relationships that develop through sound and movement between humans and the environment.

Photos from the participants'' performance in the Summer Academy 2019, Ionian University, Corfu, Greece
(Photos by Georgia Strati)

Junior + Teen Sonic Arts Academy

Report by **Andreas Mniestris, Elina Kalampokini**

The 1st Junior + Teen Sonic Arts Academy took place in Corfu on 7-8 July 2018. It was part of the 11th Sonic Arts Summer Academy and Festival held by EPHMEE (Lab for Electroacoustic Music and Research) of the Ionian University, Department of Music. The Junior + Teen Academy was an innovative project introducing music technology and contemporary music to students of 6-12 years of age (Junior) and 13-18 years (Teen).

A. During the Junior Academy the children had the opportunity to learn important historical facts about the development of electroacoustic technology relating to music for the past 100 years, and also the birth of electroacoustic music through a presentation in class and a series of interactive activities. These included environmental recordings, playing with electronic instruments, preparing and performing a short story using sounds as a basic narrative element. They listened to the sounds carefully at the beach and other areas of Corfu's old fortress and recorded many samples they needed for their final project. They also played and produced sounds using a theremin and a modular synthesiser. At the end of the project they performed a short play in front of an audience. All the children had an active role in playing music and creating soundscapes with live and recorded sounds. There was also the opportunity for a student to express her beat-boxing talent in a duet with a ukulele played by the instructor.

B. During the Teen Academy the students had the opportunity to learn about:

- basic facts about music technology and its history,
- the evolution of sound recording,
- what an electronic musical instrument is and how to produce sounds on a theremin and a modular synthesiser,
- basic notions of music production and the evolution of electroacoustic music.

The sessions included group discussions about the music to which they like to listen, the music they dislike, about their emotions and adolescence and how they are related to music. The students composed a sound design for a video, performing it live with the video projection in front of an audience.

The students in both teams, Junior and Teen, as well as their parents who attended their performance, were thrilled about the whole experience. The Junior and Teen Summer Academy in Music and Technology was a very important introduction of the Electroacoustic Music Lab (EPHMEE) to the local community of Corfu and particularly to the young and very young students. It worked as a centre for new ideas about how to perceive the sonic environment and also for creative applications using modern electroacoustic technologies.

The program was designed and executed by Elina Kalampokini, graduate of the Music Department of Ionian University in Composition, collaborator of EPHMEE within the ERASMUS+ program "Le Paysage Sonore dans lequel nous vivons".

MEDIA RELATED TO THIS ACTION

Recordings in the Old Fortress of Corfu to be used for the composition of a sound based narrative of a short story.

Juniors

1. recording the sea - (AUDIO-MP3) - VIDEO
2. recording imitations of animal sounds 1 - (AUDIO-MP3)
3. recording imitations of animal sounds 2 - (AUDIO-MP3)
4. recording piano sounds - (AUDIO-MP3)
5. recording singing voice sounds - (AUDIO-MP3) - FOTO
6. recording imitations of animal sounds 3 - (AUDIO-MP3)
7. playing with analogue synth - FOTO - VIDEO
8. class work - FOTO

Teens

9. final live performance – "real time sound-track" for a video piece FOTO1 – FOTO2 – FOTO3

GLOSSARY

Andreas Mniestris

This is a collection of brief definitions and descriptions of some key terms appearing in the main text of this book. Most of them are quotations from various sources, appearing in the 'References' and/or directly linked to their appropriate locations on the World Wide Web.

Acoustemology: "conjoins the words 'acoustic' and 'epistemology' to refer to a sonic way of knowing and being in the world. The term was introduced by the anthropologist and ethnomusicologist Steven Feld following his fieldwork among the Kaluli of Papua New Guinea. " (Rice T. 2018).

"Acoustemology joins acoustics to epistemology to investigate sounding and listening as a knowing-in-action: a knowing-with and knowing-through the audible." (Feld, 2015, p.12).

"Acoustemology, Acousteme: I am adding to the vocabulary of sensorial-sonic studies to argue the potential of acoustic knowing, of sounding as a condition of and for knowing, of sonic presence and awareness as potent shaping forces in how people make sense of their experiences. Acoustemology means an exploration of sonic sensibilities, specifically of ways in which sound is central to making sense, to knowing, to experiential truth. This seems particularly relevant to understanding the interplay of sound and felt balance in the sense and sensuality of emplacement, of making place" (Feld, 1996, p. 97).

Acoustic Ecology: "is the study of the relationship between living organisms and their environment. Acoustic ecology is thus the study of the effects of the acoustic environment [...] on the physical responses or behavioral characteristics of creatures living within it. Its particular aim is to draw attention to imbalances which may have unhealthy or inimical effects" (Schafer, 1994, p. 271).

Acoustic Horizon: "The farthest distance in every direction from which sounds may be heard" (Truax, 1999).

Acoustic Niche Hypothesis: Each animal has its own sonic niche or space in the frequency spectrum and a specific time slot for its sound making, which is not occupied by other animals at the particular time (Krause, 1993).

Acoustic Scene: is the captured entity of the sonic sources that contribute to the formation of a soundscape around an audio-capturing point. "An acoustic scene denotes the label of the place *where* the sound was recorded (e.g., train, car, park, indoor), the *situation* (e.g., in a meeting, in an emergency), and the *human activity involved* (e.g., cooking, chatting, vacuuming)." (Imoto, 2018, p.182). [italics by the editor].

Acoustic Space: "The profile of a sound over the landscape. The acoustic space of any sound is that area over which it may be heard before it drops below the ambient sound level." (Schafer 1994, p. 271).

Airgun (Seismic): "An airgun is a tool used to examine layers of the seafloor and study the Earth's history. It can also be used to locate subsea oil and gas deposits. Airguns rapidly release compressed air, causing a bubble to be formed. The formation of the bubble produces a loud sound that travels through the water to the ocean floor. Some of the sound energy is reflected off features of the seafloor. This reflected sound travels back to the sea surface where it can be recorded by hydrophone arrays called streamers. Some of the airgun sound can also travel into the seafloor and reflect off sediment or rock layers within the seabed. These deeper, reflected sounds also travel back up to the surface and may be detected by the hydrophones.

The acoustic characteristics, particularly strength and timing of the reflected signals, can be analyzed by computer software to provide information on and imagery of geological features below the seafloor, including oil and gas deposits." (dosits.org).

Auditory Scene Analysis: is the mental capacity of segregating the various sonic sources 'fused' together in the audio signal that reaches and stimulates the hearing mechanism into independent perceptual units (auditory streams) that correspond to each one of these sonic sources. The theory of Auditory Scene Analysis (ASA) was proposed by Albert Bregman in (Bregman, 1990).

Cavitation: "It is a phenomenon which occurs when sound waves of high intensity propagate through water. When the rarefaction tension phase of the sound wave is great enough, the medium ruptures and cavitation bubbles appear. Cavitation bubbles can be produced by the tips of high-speed propellers. Bubbles affect the speed of sound as well as its attenuation". (Rossing, 2007, p. 6). "The phenomenon of cavitation, the rupture of liquids, is readily observed in boiling water, turbines, hydrofoils, and in seawater in the vicinity of a ship's rotating propeller. It occurs in those regions of liquids that are subject to high-amplitude, rapidly vacillating pressures. Cavitation also occurs in a liquid irradiated with high-energy ultrasound. [...] [The] sudden collapse of bubbles [that] constitutes the phenomenon of cavitation [...] can result in the very sudden release of a comparatively large amount of energy." (Raichel, 2006, pp. 451, 452).

"Snapping shrimp use cavitation -creating small bubbles that explode in the water and create pressure waves- to communicate, avoid predators and kill prey" (Rice, E. – Dodge, S.).

Clairaudience: Term introduced by R. M. Schafer referring to exceptional hearing ability, particularly with regard to environmental sound: " ~ Literally, clear hearing. The way I use the term there is nothing mystical about it; it simply refers to exceptional hearing ability, particularly with regard to environmental sound. Hearing ability may be trained to the clairaudient state by means of EAR CLEANING exercises." (Schafer, 1994, p. 272).

Decibel: dB is one tenth of one Bell, which is a unit of measurement expressing the ratio of the value of a physical quantity over a predefined value of reference for this physical quantity, on a logarithmic scale. In other words it expresses how much bigger or smaller a quantity is in relation to a defined quantity of reference, based on the way humans perceive changes.

Doppler Effect: is the perceived change in pitch of the sound produced by a sonic source, which is in motion relative to an observer. " If the source producing the sound is moving toward or away from a listener, this affects what they hear. The Doppler shift effect is a continuous pitch bending that occurs when a moving sound source passes a stationary listener. If we are standing by the railroad tracks and a train approaches at high speed, we hear the pitch shift upward as it approaches and shift downward as it passes by. The pitch shift upward is attributable to the shortening of the wavefronts as the sound approaches, and the pitch shift downward is attributable to the corresponding lengthening of the wavefronts as it recedes into the distance." (Roads, 2015).

Echo: The repetition of a sound due to the reflection of its carrying acoustic wave on a boundary surface. (Also the analogue and/or digital electronic devices that can reproduce this effect).

Echolocation: The mechanism that permits the recognition of an object and its distance from an observation point, within an observer's environment, by means of emission of acoustic waves from this point and the reception at the same point of their reflections from that object. "Animal Echolocation is used by several animal species. Echolocating animals emit calls out to the environment and listen to the echoes of those calls that return from various objects near them. They use these echoes to locate and identify the objects." (wikipedia). This is a mechanism, vital for navigation and foraging. Human Echolocation is used by humans, particularly visually impaired individuals, and is the ability to assess features of their environment and detect objects within it by learned techniques of interpreting the echoes of

actively created sounds (i.e., tapping their canes, making clicking noises with their mouths etc.). Other categories of echolocation are the SONAR (sound navigation and ranging) and the (medical) ultrasonography, (the use of ultrasound echoes to produce images of internal body organs). (wikipedia)

Envelope: is the outline of the extremes in the waveform of a signal.

Deep Listening: is a practice that is intended to heighten and expand consciousness of sound in as many dimensions of awareness and attentional dynamics as humanly possible (Oliveros, 2005 p. xxiii).

Futurism: was a movement of artists which included strong social activism and appeared early in the second decade of 20th century. These artists proposed radical aesthetic ideas and practices, deeply influenced by the technological progress of science and industry, and applied them into painting, poetry, music and other arts. The movement originated in Italy by Filippo Tommaso Marinetti, Umberto Boccioni, Carlo Carrà, Gino Severini, Giacomo Balla, Luigi Russolo, et al., and forms of it appeared in Belgium and England and also in Russia (Vladimir Mayakovsky, Velimir Khlebnikov, Kazimir Malevich et al.).

Glissando: is a continuous gliding of a tone between two pitches.

Hearing Loss: is "the partial or total inability to hear sound in one or both ears. Symptoms of hearing loss may include: certain sounds [to] seem overly loud in one ear, difficulty following conversations when two or more people are talking, difficulty hearing in noisy areas, trouble telling high-pitched sounds (such as "s" or "th") from one another, less trouble hearing men's voices than women's voices, hearing voices as mumbled or slurred. Other symptoms include: feeling of being off-balance or dizzy (more common with Ménière disease and acoustic neuroma), feeling of pressure in the ear (in the fluid behind the eardrum), ringing or buzzing sound in the ears (tinnitus) [...]

Conductive Hearing Loss (CHL) is a type of hearing loss, which occurs because of a mechanical problem in the outer or middle ear. This may be because: the 3 tiny bones of the ear (ossicles) are not conducting sound properly and/or because the eardrum is not vibrating properly in response to sound. Conductive hearing loss can often be treated when the causes producing it include: buildup of wax in the ear canal, damage to the very small bones (ossicles) that are right behind the eardrum, fluid remaining in the ear after an ear infection, foreign object that is stuck in the ear canal, hole in the eardrum, scar on the eardrum from repeated infections. [...]

Sensorineural hearing loss (SNHL) occurs when the tiny hair cells (nerve endings) that detect sound in the ear are injured, diseased, do not work correctly, or have died. This type of hearing loss often cannot be reversed. Sensorineural hearing loss is commonly caused by: acoustic neuroma, age-related hearing loss, childhood infections (such as meningitis, mumps, scarlet fever, and measles), Ménière disease, regular exposure to loud noises (such as from work or recreation), use of certain medicines. [...]

Hearing loss may be present at birth (congenital) and can be due to: birth defects that cause changes in the ear structures, genetic conditions (more than 400 are known), infections the mother passes to her baby in the womb (such as toxoplasmosis, rubella, or herpes). [...]

The ear can also be injured by: pressure differences between the inside and outside of the eardrum (often from scuba diving), skull fractures (can damage the structures or nerves of the ear), trauma (from explosions, fireworks, gunfire, rock concerts, and earphones)." (A.D.A.M. Medical Encyclopedia)

Hi-Fi Soundscape: "Abbreviation for high fidelity, that is, a favorable signal-to-noise ratio. The most general use of the term is in electroacoustics. Applied to soundscape studies a hi-fi environment is one in which sounds may be heard clearly without crowding or masking" (Schafer, 1994, p. 272).

Listening,

Inclusive: "is impartial, open and receiving [type of listening] and [it] employs global attention. [...]"

Exclusive: "[is a type of listening that] gathers detail and employs focal attention. Focal attention is necessarily limited and specific. The depth of exclusive listening is clarity." (Oliveros, 2005, p. 15).

Lo-Fi Soundscape: "Abbreviation for low fidelity, that is, an unfavorable signal-to-noise ratio. Applied to soundscape studies a lo-fi environment is one in which signals are overcrowded, resulting in masking or lack of clarity" (Schafer, 1994, p. 272).

Long-term Memory: "Memory is divided into two general types: working memory (or "short-term memory") and long-term memory. In working memory, we have space for a limited number of items, such as the digits of a phone number or a name and address. In long-term memory, we have a coding system that allows us to store and retrieve all sorts of items: faces, text, images, and procedures. By allocating attention, we seem to be able to transfer some items from short-term memory into long-term memory." (Viirre, 2006, p. 909).

"Information retained for a significant time (days, months, or years) is referred to as long-term memory. Theorists have tended to split long-term memory into two major divisions, taking into account the observable fact that people with amnesia may retain one type of *long-term memory* and not another. The key distinction is between declarative and nondeclarative memories." (Gazzaniga et al., 2019, p.389)

Loudspeaker: is an electroacoustic transducer that produces sound from an electrical signal. The development of loudspeakers goes back to – roughly – the sixth decade of the 19th century and continues ever since resulting in a vast variety of loudspeaker designs and applications. An "important thing about any [loud]speaker is its frequency response. It is here that designers spend most of their effort, for the wider the frequency response (the higher and lower the musical tones it can reproduce), the more you hear." (Burhoe, 1978).

Macrocosmic Composition: "[...] I am going to treat the world as a macrocosmic musical composition. This is an unusual idea but I am going to nudge it forward relentlessly. The definition of music has undergone radical change in recent years [...] First with the huge expansion of percussion instruments in our orchestras, many of which produce non pitched and arhythmic sounds; then through the introduction of aleatoric procedures in which all attempts to organize the sounds of a composition rationally are surrendered to the 'higher' laws of entropy; then through the opening-out of the time-and-space containers we call compositions and concert halls to allow the introduction of a whole new world of sounds outside them [...]; then in the practices of musique concrète, which inserts any sound from the environment into a composition via tape; and finally in electronic music, which has revealed a whole gamut of new musical sounds, many of them related to industrial and electric technology in the world at large. Today all sounds belong to a continuous field of possibilities lying within the comprehensive dominion of music. Behold the new orchestra: the sonic universe!" (Schafer, 2012, pp. 96-97).

Magnetic tape recorder: is a device that can record - and reproduce - an electrical signal on a "magnetic tape", i.e. a narrow strip of plastic film covered by a material sensitive to magnetism. It was the key factor for very significant improvement in the history of sound (and eventually video) recording.

Masking: is a phenomenon in psychoacoustics, occurring "when the audibility of a sound is interfered with by the presence of noise or other background sound" (Raichel, 2006, p. 226). "In such a case the [sound] which causes the masking is known as the 'masker' and the [sound] which is masked is known as the 'maskee' […]. The extent to which masking occurs depends on the frequencies of the masker and maskee and their amplitudes" (Howard et al., 2009, p. 260). Except from 'simultaneous masking', which occurs when maskee and masker

sound at the same time, there are also two kinds of 'non-simultaneous masking': "These are 'forward masking' or 'post-masking' and 'backward masking' or 'pre-masking'. In forward masking, a pure tone masker can mask another tone (maskee) which starts after the masker itself has ceased to sound […]. In backward masking a maskee can be masked by a masker which follows it in time, starting up to approximately 10 ms after the maskee itself has ended." (Howard et al., 2009, p. 263).

Microphone: is an electroacoustic transducer that converts sound to an electrical (audio) signal.
Carbon (Microphone) is the first design of such transducers broadly used in telephone sets since the late 19th century.

Morphology (of Sound): Introduced by (Schaffer, 1966) it refers to the changes a listener can distinguish in a perceived sonic entity (or sound object) while this is evolving in time. "Morphology is the general configuration, form and material of sonic events as they are perceived. The term particularly refers to the evolution of sounds through time. Applied to soundscape studies, it refers to changes in groups of sounds with similar forms or functions when considered historically or geographically." **(**Couprie**,** EARS**).**

Musique Concrète: Pierre Schaeffer invented this term to describe his compositional efforts in the late '40s and early '50s. This had as a result a new compositional approach that is based on the idea of "sound object" which is a perceived sonic entity. In (Schaeffer, 1952), he presents in detail the first stages of his research.
" When in 1948 Pierre Schaeffer gave the name Concrète to the music he invented, he wanted to emphasise that this new music came from *concrete sound material*, sound heard in order to try and abstract musical values from it. And this is the opposite of classical music, which starts from an abstract concept and notation and leads to a concrete performance." (Chion, 1983, p. 39).

Noise: "Has various meanings such as: 1. Unwanted sound, 2. Unmusical sound, 3. Any loud sound, 4. Disturbance in any communication system." (Truax, 1999).

Noise pollution: is a situation appearing in an environment when, owing to sound, dangerous or destructive conditions threaten living organisms that inhabit it. "Environmental noise is defined as the noise emitted from all sources except in the industrial workplace. The major sources of environmental noise are road, rail and air traffic, industries, construction and public works, and the neighborhood. […] In contrast to many other environmental problems, noise pollution continues to grow, accompanied by an ever-increasing number of complaints (WHO, 1999). […] Industry, aircraft and road traffic are the clear leaders in the generation of noise complaint. […] According [the] WHO definition of health, noise impacts such as population annoyance, interference with communication, and impaired task performance are health issues. Noise has a significant impact on the quality of life and is a health problem in accordance with the World Health Organization's (WHO) definition of health (WHO, 1999)". (Schomer, 2001).

Onomatopoeia: the naming of a thing or action by vocal imitation of the sound associated with it (such as buzz, hiss). [...] Onomatopoeia came into English via Late Latin and ultimately can be traced back to Greek *onoma,* meaning 'name', and *poiein,* meaning 'to make'. (Merriam-Webster).

Presbycousis: (also spelled **presbyacusis**, from Greek *presbys* 'old' + *akousis* 'hearing'), is hearing loss related to ageing.

Reverberation: is "a propagation effect in which sound continues after the cessation of its emission. Reflections of the sound on surfaces in the surrounding space are added to the direct signal. The longer these reflections conserve their energy, the grater the reverberation time." (Augoyard,Torgue, 2006, p. 111). "[...] the amplification of sound pressure levels in an enclosed space resulting from multiple reflections off room surfaces." (Cowan, 2015, p. 177)

Resonator: is a system that can be set in vibration and has the property of oscillating at maximal amplitudes in certain (resonant) frequencies. Specifically: "*Helmholtz resonator* – also known as a volume resonator [is] an enclosure characterized by a small opening leading into a larger volume chamber, used to absorb or amplify sounds in a limited frequency range associated with the sizes of the chamber and opening. " (Cowan, 2015, p. 173).

Schizophonia or Schizophonic: (Greek: *schizo* = split; *phone* = voice, sound). The term was first employed by R. M. Schafer in *The New Soundscape* (Toronto, 1969, pp. 43-47) to refer to the split between an original sound and its electroacoustic reproduction in a soundscape. Original sounds are tied to the mechanisms which produce them. Electroacoustic sounds are copies and they may be reproduced at other times or places. Schafer employs this 'nervous' word in order to dramatize the aberrational effect of this twentieth century development (Truax, 1999).

Seismic survey: "A seismic survey is a method of investigating underground properties and rock patterns using induced shock wave reflections." (Collins).

Silence: is the perceived absence of sound. Here is a very famous citations about silence, by John Cage: "[...] one enters an anechoic chamber as silent as technologically possible [...], to discover that one hears two sounds of one's own unintentional making (nerve's systematic operation, blood's circulation), the situation one is clearly in is not objective (sound-silence), but rather subjective (sounds only), those intended and those others (so-called silence) not intended." (Cage, 2011, p. 13-14).

SONAR: "The word 'sonar' originated in the U.S. Navy during World War II as an acronym for 'SOund NAvigation and Ranging', which referred to the systematic use of sound waves, transmitted or reflected, to determine water depths as well as to detect and locate submerged objects." (Hempstead, 2005, p. 725).

Soundscape: "The sound field p(r, t) may [...] be called a soundscape, an overall acoustical environment –both indoors and outdoors– that includes all sound, both wanted and unwanted." (Rossing, 2007, p. 999).

"The sonic environment. Technically, any portion of the sonic environment regarded as a field for study. The term may refer to actual environments, or to abstract constructions such as musical compositions and tape montages, particularly when considered as an environment." (Schafer, 1994, p. 274).

Soundscape Composition: "The soundscape composition is a form of electroacoustic music, developed at Simon Fraser University and elsewhere, characterized by the presence of recognizable environmental sounds and contexts, the purpose being to invoke the listener's associations, memories, and imagination related to the soundscape. It grew naturally out of the pedagogical intent of the World Soundscape Project to foster soundscape awareness. At first, the simple exercise of 'framing' environmental sound by taking it out of context, where often it is ignored, and directing the listener's attention to it in a publication or public presentation, meant that the compositional technique involved was minimal, involving only selection, transparent editing, and unobtrusive cross-fading. This 'neutral' use of the material established one end of the continuum occupied by soundscape compositions, namely those that are the closest to the original environment, or what might be called 'found compositions'. Other works use transformations of environmental sounds and here the full range of analog and digital studio techniques comes into play, with an inevitable increase in the level of abstraction. However, the intent is always to reveal a deeper level of signification inherent within the sound and to invoke the listener's semantic associations without obliterating the sound's recognizability" (Truax, 2019).

Sound Event: "Dictionary definition of *event:* "something that occurs in a certain place during a particular interval of time." This suggests that the event is not abstracted from the time-and-space continuum which gives it its definition. The sound event, like the SOUND OBJECT,

is defined by the human ear as the smallest self-contained particle of a SOUNDSCAPE. It differs from the sound object in that the latter is an abstract acoustical object for study, whilst the sound event is a symbolic, semantic or structural object for study, and is therefore a non-abstractable point of reference, related to a whole of greater magnitude than itself." (Schafer, 1994, p. 274).

Soundmark: "The term is derived from *landmark* to refer to a community sound which is unique or possesses qualities which make it specially regarded or noticed by the people in that community." (Schafer, 1994, p. 274).

Sound Pollution "An imbalance in a soundscape caused by intruding or disrupting sound of any kind. Such an intrusion need not necessarily be excessively loud [...] but rather it needs only to have characteristics which disturb the perceived balance of a soundscape" (Truax, 1999).

Sound Pollution, Anthropogenic: is a 'sound pollution' where the "disrupting sound" is created by humans and/or human-made artefacts.

Sound Signal: "Any sound to which the attention is particularly directed. In soundscape studies sound signals are contrasted by "keynote sounds", in much the same way as figure and ground are contrasted in visual perception." (Schafer, 1994, p. 275).

Stick and Slip: "When two substances rub against each other, they frequently stick and then slip. [...] The stick-slip phenomenon, [is an] important by-product of sliding which produces most of the creaking, squealing, chattering and squeaking we hear in our everyday lives" (Rabinowicz, 1956). This mechanism causes the characteristic sound produced by bowed instruments, car brakes, many insects etc.

Stridulation: The generation of sound by some animals through rubbing parts of their bodies against each other.

"Stridulation is the act of producing sound by rubbing together certain body parts. This behavior is mostly associated with insects, but other animals are known to do this as well, such as a number of species of fish, snakes and spiders. The mechanism is typically that of one structure with a well-defined lip, ridge, or nodules (the "scraper" or plectrum) being moved across a finely-ridged surface (the "file" or stridulitrum—sometimes called the pars stridens) or vice versa, and vibrating as it does so, like the dragging of a phonograph needle across a vinyl record. Sometimes it is the structure bearing the file, which resonates to produce the sound, but in other cases it is the structure bearing the scraper, with both variants possible in related groups. Common onomatopoeic words for the sounds produced by stridulation include chirp and chirrup. " (Wikipedia).

Syrinx: (Greek σύριγξ for pan pipes) is the vocal organ of birds, located at the base of a bird's trachea. "The syrinx consists of the specialized junction between the trachea and the two primary bronchi of the lungs. It lies within the interclavicular air sac, the only unpaired sac of the avian lung-air sac system [...]" (Brackenbury, 1982).

Tinnitus: "is the medical term for 'hearing' noises in your ears. It occurs when there is no outside source of the sounds. Tinnitus is often called 'ringing in the ears'. It may also sound like blowing, roaring, buzzing, hissing, humming, whistling, or sizzling. The noises heard can be soft or loud. The person may even think they're hearing air escaping, water running, the inside of a seashell, or musical notes." (Mount Sinai, tinnitus).

Tuner (electronic**):** is an electronic device that can determine and display the pitch of a (tonal) sound.

Vitality Forms: "Forms of vitality is the term proposed by Stern (2010) to capture the way in which the human mind deals with dynamic experiences, crucial to interpersonal encounters [...]" (Español et al., 2014 p. 481). "Vitality forms are aspects of social communication that characterize personal feelings as well dynamics of movements. They are therefore related to feelings of agency and efficacy, and may be shaped and influenced by early interactions between caregivers and infants. In this ambit, infants experience a sense of personal efficacy

and a hedonic pleasure when they are recognized and confirmed by their caregivers." (Ammaniti M. et al., 2013, abstract).

Ultrasounds: Mechanical waves with frequencies higher than the highest limits of human auditory perception, i.e. higher than 20 KHz. (see also, Rossing, 2007, p. 2: *Sounds We Cannot Hear: Ultrasound and Infrasound*).

World Soundscape Project: "The World Soundscape Project (WSP) was established as an educational and research group by R. Murray Schafer at Simon Fraser University during the late 1960s and early 1970s. It grew out of Schafer's initial attempt to draw attention to the sonic environment through a course in noise pollution, as well as from his personal distaste for the more raucous aspects of Vancouver's rapidly changing soundscape. This work resulted in two small educational booklets, The New Soundscape and The Book of Noise, plus a compendium of Canadian noise bylaws. However, the negative approach that noise pollution inevitably fosters suggested that a more positive approach had to be found, the first attempt being an extended essay by Schafer (in 1973) called 'The Music of the Environment', in which he describes examples of acoustic design, good and bad, drawing largely on examples from literature" (Truax 2019).

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