Soundscape Compositions for Art Classrooms

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ABSTRACT

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This thesis explores ways in which the process of listening, recording, and editing everyday soundscapes can be incorporated in the art classroom. For this study, I designed and carried out two series of educational workshops; firstly, with a group of students at an all-girls high school in Montreal; and secondly, with a group of art and music teachers from *QAIS* (Quebec Association of Independent Schools). The data generated from these workshops has been used to develop adaptable educational interventions for teaching this process for Art Education. The data also indicates that this creative practice has a number of salient features for learning and art education. For one, listening deeply to familiar spaces such as a school or classroom can shift and expand our conscious awareness of these surroundings. Furthermore, using technological devices to listen, record, and edit sound can allow students to experience quotidian environments in a different way. This can deepen students' engagement with common environments by asking them to notice and creatively explore the sounds that define their daily experiences. This artistic and educational approach is grounded in a theoretical understanding of consciousness as a unity that integrates images, smells, textures, thoughts, feelings and memories to experience the world. Thus, the thesis calls for an approach to Art Education that is open to sensory multiplicity in exploring everyday experiences. Sound is a crucial component of such experiences; and as such, it warrants study in art classrooms.

Keywords: Soundscapes, Sound Art, Consciousness, Art Education

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I would like to dedicate this thesis to my father and mother. Some of my fondest memories as a teenager are going on camping trips and enjoying conversations about the stars, the universe, humanity, politics and life with my father and brothers around the campfire. The curiosity that these conversations instilled in me are at the heart of the work I am doing now. The extraordinary sacrifices that my mother made to raise three rambunctious boys motivate me to make the most of opportunities my parents never had. Without their support, this thesis would not have been possible.

Since in order to speak,
one must first listen,
learn to speak by
listening.

Rumi

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Preface

Years ago, a friend visited me in my tiny apartment in the suburbs of Tokyo. He had just returned from a retreat in a Zen monastery and was eager to share his experiences with me. He sat me down on an elevated cushion, showed me the proper posture for *Zazen* mediation, and told me to breathe slowly and deeply and count my breath. I obliged, and after sitting quietly in that position for five minutes, I began to hear children laughing and screaming, birds chirping and locomotives moving outside of my room. At that moment, my conscious awareness was enlarged to encompass a larger world. Years later, I entered the Masters of Art Education program at Concordia University, at which point, I was most interested in expanding my creative process by exploring different media and tools, including a range of digital audio recording and editing devices. I distinctly remember my first experience of using this audio recording equipment; an experience akin to what I had encountered years ago through meditation. The simple and familiar environment of my backyard had transformed into an aural of ocean imbued with sonic energy when listened to digitally. This experience brought to my attention a world full of sound that I had been tuning out, and helped me realize the potential for technology to be used to help tune in our surroundings. I did not realize at the moment that this experience would come to define the artistic, theoretical and educational journey I undertook for this thesis.

Chapter 1: Introduction

1.1 Introduction

This thesis is rooted in my creative process of developing *soundscape compositions*, which involves three distinct steps: firstly, going into the field and recording *soundscapes*; secondly, editing the recorded sounds; and finally, presenting the final recording as an installation, a sound file or in conjunction with visual material. This process in itself is fertile ground for examining how we experience the world due to the fact that, at every instance, the ear receives far more auditory information than we are aware of. By turning the attention of our ears to these sounds, and using recording devices that indiscriminately absorb and amplify sound, we can transform our conscious awareness of quotidian environments. By manipulating, compiling, composing and presenting these sounds, we can develop soundscape compositions that allow us to listen to the familiar world in fresh and exciting ways. Engaging in this process is a contemplative exercise that calls on the listener to reflect on how we experience the world around us, and our relationship to it. In a school, for example, we can start reflecting on the sounds that guide our behaviour, or those to which we have a visceral reaction. For Maturana and Varela (1998), "reflection is a process of knowing how we know. It is an act of turning back upon ourselves. It is the only chance we have to discover our blindness" (p. 24). Reflection is a vital human activity because it deepens our understanding of ourselves, and our relationship to the world. Our relationship to everyday soundscapes is a crucial component of our connection with our world and the people in it. Turning our attention to this relation can have a transformative effect by allowing us to experience the ordinary world differently. For one, we can recognize that we are not merely passively observing the world, but actively "bringing forth new worlds" through our consciousness (Maturana & Varela, 1998). Artistic practice enables us to *bring forth*

new worlds by allowing us to perceive differently and to imagine other possibilities. According to Elliot Eisner (2002), this is the true value of Art Education: it can transform consciousness.

For my Masters of Art Education thesis, I have developed and researched educational workshops that introduce this creative process of listening, recording, and editing sound in the art classroom. To achieve this, I implemented a Design-Based Research methodology to create workshops that were implemented in two distinct sites. A first series of four workshops were carried out at a private all-girls high school with up to eight participating students and their teacher from October 2013 to January 2014. During these workshops, participants discussed the act of listening with the ear and microphone, went on soundwalks to record sounds of their school, and edited these sounds to create soundscape compositions that present the familiar environment of their school in new and interesting ways. In March 2014, another workshop was held at Concordia University with three art and music teachers from the *Quebec Association of Independent Schools* (QAIS). During the workshop, participants engaged in the process of listening and recording sound, and discussed the pedagogical and educational potential of this process in their own classrooms. By conducting different series of workshops, I have been able to research and refine the procedures with the aim of introducing the creative act of composing soundscapes for the art classroom.

The first outcome of this research has been the development of a teaching plan for introducing *sound art*, *soundscapes* and the creative process of *soundscape composition* for art classrooms. This includes adaptable suggestions for procedures, listening exercises, example artists and equipment (see Appendix 1). Moreover, the data gathered during both phases verifies that when we listen carefully, new sounds are often noticed, and there are real educational benefits to engaging in acts of deep listening in art classrooms. In addition to raising students' awareness of their interaction with their school environment, such endeavours can develop

technological literacy. Nowadays, multimodal devices such as computers and smartphones are pervasive and often used by youth to tune out the world around them. In this creative process, technology is used to facilitate deeper sensitivity to our surrounding, encouraging youth to be mindful of the environments they inhabit every day.

1.2 Statement of Purpose

Design-Based Research has been chosen as the methodology for this research as it provides a practical, systematic and flexible approach to designing educational interventions, which aim to develop "contextually-sensitive design principles and theories" (Wang & Hannafin, 2005, p. 6). As such, the objective of the research is twofold: firstly, to develop a set of educational procedures that integrate soundscape compositions in the art classroom for teenagers and young adults; and secondly, to explore theoretical questions about consciousness by using technology that shifts one's awareness of the ocean of sound waves in which one is are always swimming. Once the workshops were completed in March 2014, the data from both series was systemically analysed. Based on this reflection, it is possible to suggest a set of contextually-sensitive design principles for bringing sound and listening into classrooms, which can be adapted by art teachers in various contexts. Additionally, I will describe the nature of the conscious shift that can occur when one uses either the ear or a digital microphone as an instrument to hear the world in a different way. By grounding these descriptions in a theoretical framework that understands consciousness as an on-going *bringing forth* of a world, I suggest ways in which technology can be used creatively to intervene in the experience of quotidian spaces. This exploration offers some insights on how technology can be used innovatively and provocatively in art classrooms.

1.3 Research Objective and Question

Throughout the study, the research objective and question were crucial in the decision-making process. The research objective focuses on the design of the workshops, which centre on the acts of deep listening, going on *soundwalks* to record, and editing and presenting soundscape compositions. The research question aims to extricate data that could be useful in developing educational procedures and theoretical insights from the workshops. While implementing the specific lessons, both the question and objective guided the topics of conversations I had with high school students and teachers. Finally, during the analysis stage, data was filtered and classified according to seven keywords—salient creative features, listening, recording, editing, presenting, conscious awareness, and ambient sounds—which were extracted from the research question. Categorizing the data in this manner has enabled me to draw some conclusions on the effectiveness of procedures in art classrooms, and to explore theoretical questions about conscious awareness of ambient sounds.

- **Objective:** To develop, test and refine a series of workshops in which participants engage in a creative process of listening, recording and editing sound that aims to shift and expand conscious awareness of familiar ambient sounds.
- **Question**: For participants in these workshops, what are the salient creative features of the process of listening, recording, editing and presenting soundscape compositions to explore conscious awareness of ambient sounds?

1.4 Justification and Rationale

There is a cultural tendency to associate sight with intellect and privilege it above other senses (Bal, 2003; Duncum, 2012; Howes, 2014). Mieke Bal (2003) labelled this supposed superiority of sight a form of *visual essentialism,* which fails to take into account that looking is

always interpretive, affect-laden, cognitive and intellectual. That is, the sense of sight is anchored inside a body that is always hearing, touching, tasting, smelling, feeling, thinking, interpreting and understanding. In this view, one sense cannot be separated from the others, as sensory multiplicity is an inherent part of our experience of the world. This theoretical understanding of the *visual* has practical implications for the field of Art Education for it calls into question the exclusivity of the visual in art classrooms. The integration of the tactile, olfactory and auditory senses is pivotal to this understanding of visual arts. There is some indication that numerous contemporary artists have adopted this notion of an impure visual arts practice, and this desire is evident in the fields of Art Education and Visual Culture Studies. This research is situated in an aspiration to expand our understanding of visual art education, by focusing on and creatively exploring the world with the ears and the eyes. A curriculum for soundscape composition in the art classroom can help to overcome the bias that the visual arts deal exclusively with the sense of sight, and can present possibilities for exploring the multiplicity of the sensorium. It is also my hope that designing and developing a set of concrete procedures for listening, recording, editing and presenting soundscapes can inspire artists and educators to become aware of the endless potential of sounds for aesthetic exploration.

1.5 Limitations

Design-Based Research places an emphasis on testing out ideas in the messiness of real-world contexts, which in the case of this investigation is the art classroom. A key to the success of this research was finding an appropriate site to conduct the design experiments. At first, after-school workshops in a high school provided an ideal setting to work with students and their teacher, giving interested students the opportunity to experiment with the medium of sound. However, this site presented a number of obstacles in terms of scheduling and time-commitment, which resulted in fluctuating numbers of attendees for each workshop. Testing out the process of

listening, recording, editing and presenting soundscapes is a time-consuming affair, which requires more than a few one-hour voluntary workshops after school. Moreover, it has been my experience that fully developing lesson plans and procedures often demands cycles of application, refinement and reapplication. The challenges in obtaining access to students who could commit a significant portion of their own energies on a soundscape project prevented the possibility of deep engagement with the process. For this reason, I regard the first series of workshops an important first step, which generated ample pertinent data for developing teaching ideas for soundscape compositions.

This insight from conducting the workshops in a high school setting led to a number of alterations in the second phase of the research. Namely, the workshops were compressed into a single session, which would avoid any scheduling issues and allow for an immersive and intensive creative experience. Furthermore, it was decided to carry out the second series with a small group of art and music teachers, who share an interest in incorporating the process of composing soundscapes in their teaching. There are two clear drawbacks to this approach: a single session would not allow for the level of in-depth engagement that a longer series of sessions would; and moreover, running the workshop with teachers meant that this workshop was not tested in the real-work context of a classroom. On the other hand, the experience and expertise of the teachers meant that they could provide salient insights about the proposed ideas and procedures, which they could adapt variously in their own classrooms. Furthermore, the enthusiastic embrace of soundscape compositions by these educators affirms the value of this process for Art Education.

Taking this into consideration, it is imperative to highlight that the suggestions outlined in the “Findings” chapter are not meant as fail-proof formulas for teaching soundscape compositions in any context. Rather, they are a set of ideas that have been tested with art students

and teachers in two different contexts, each of which presented restrictions in the amount of time and energy that could be committed by the participants. Nevertheless, the data generated from conducting these design experiments has been invaluable for highlighting effective and ineffective approaches to teaching this process, as well as developing theoretical insights on using technology to raise conscious awareness of environmental sounds.

1.6 Terminology

1.6.1 Sound Art

This term was coined by Canadian composer Dan Lander as an umbrella term to describe diverse and interdisciplinary practices that use sound as a central component, such as *experimental music*, *ambient music*, *sound installations* and *soundscapes* (Licht, 2007). In Western art, early examples of sound art include Luigi Russolo's noise machine, Dadaist and Futurist sound poetry and fluxus happenings. A number of prominent contemporary artists today are known for their work with sound, including 2010 Turner Prize winner Suzan Philipsz, pioneering sound sculptor Bill Fontana, and installation artist Janet Cardiff. This term will be further developed in chapter two.

1.6.2 Soundscapes

This term was coined by Canadian composer Murray Schafer (1977), who defines it as any sonic environment, which can be actual or an "abstract construction such as musical compositions and tape montages, particularly when considered as an environment" (p. 275). Hildegard Westerkamp (2002), a protégé of Schafer and key contributor to the field of Soundscape Studies, further elucidates by describing soundscapes as "the study of the interrelationship between sound, nature and society" (p. 52). Essentially, soundscapes involve methodical studies of a given environment to gain an understanding of the intersection of social

behaviours and natural phenomena through the study of sounds. Examples of such studies are provided in the literature review.

1.6.3 Soundscape Compositions

I am using this term to designate a specific creative process of listening, recording, editing and presenting soundscapes for the art classroom. On the one hand, this term borrows many of the key components identified by Schafer and his contemporaries; namely, these compositions are a careful study of the sonic environments of schools and art classrooms. However, there is an added emphasis on creative intervention in these aural spaces through the acts of recording and collecting sounds, editing and composing the audio files, and presenting the finished projects as audio recordings, art installations or video art.

1.6.4 Soundwalk

"A soundwalk is any excursion whose main purpose is listening to the environment" (Westerkamp, 2007, p. 1). This term was first used by members of Murray Schafer's Soundscape World project, and has since been developed by Westerkamp, Andra McCartney and Janet Cardiff, among others. This act of going for a walk and attentively listening to every sound in the environment is a useful strategy for engaging with soundscapes. For this research, participants were asked to go on several soundwalks in their school or on campus in order to collect sounds. As such, soundwalking is a key aspect of the recording stage of a soundscape composition. It will be discussed further in the "Methodology" and "Findings" chapters.

1.6.5 Consciousness

The Merriam-Webster (2014) definition of this term is "the quality or state of being aware especially of something within oneself" and being "conscious of external objects, states, or facts" (Def. 1, Def. 2). In the context of this thesis, this term is often understood in relation to awareness of environmental sounds. The question of interest is what guides our awareness of the sounds that

surround us. This thesis draws on three texts that explore the nature of human consciousness. Firstly, Tor Norretrander (1999) uses the language of Artificial Intelligence, Communication Theory and Information Theory to show that our conscious awareness of the world is minute compared to the amount of sensory information the nervous system observes. Maturana and Varela (1998) root consciousness in the biological genealogy of our species, which shares a fundamental property with all living beings: we are self-replicating unities. In their view, all acts of knowing and perceiving must take into account "the living being as a whole" (p.34). Merlin Donald (2001) adds the human propensity for culture and language as an essential component of our consciousness. As such, we can infer that our awareness of the world around us integrates vast amounts of sensory information, filtered through culture and habituation, in order to arrive at a specific conscious state. This notion forms the theoretical framework of the thesis. In chapter three, I will explore the nature of human consciousness in relation to the experience of everyday soundscapes and the creation of soundscape compositions. In chapter five, I will discuss the potential for educational interventions to shift and expand awareness of these soundscapes.

1.7 Organization of Thesis

This thesis contains six chapters: the introduction, literature review, theoretical framework, methodology, findings and conclusion. The literature review begins by contextualizing this research within the field of Art Education. This review also covers the key words of sound art and soundscapes in depth. Chapter three presents consciousness as the theoretical framework for this study. I draw on my creative process of listening, recording and editing sound to explore the nature of human consciousness and how it affects our experience of the auditory world. Chapter four focuses on the application of this process for the art classroom. This chapter covers how the methodology of Design-Based Research was used to design and carry out educational workshops, and to analyse the data generated from these workshops. The

results of this analysis are discussed in the fifth chapter. The findings include effective approaches for teaching the process of soundscape composition, as well as theoretical insights on the impact of this process on conscious awareness. The thesis concludes with a summary, discussion of its implications for Art Education, and future directions.

Chapter 2: Review of Literature

2.1 Introduction: The Senses in Art, Culture and Education

When advocating for the inclusion of sound in visual art classrooms, two important questions are often raised: What do the visual arts have to do with sound? Is sound art not something music educators teach? While these queries stress the need to define terminology and outline the value of teaching sound in art classrooms, they are also rooted in the fundamental assumption that the visual arts are exclusively about seeing, and should therefore be separated from other sensory experience. According to David Howes (2014), "this single-sensed understanding of art, although it has deep roots in Western thought, only reached its full fruition in the modern period" (p. 17). In pre-industrial societies, a hands-on culture dominated in which a work of art was "appreciated by how it felt, as well as by how it looked" (p. 17). However, the tendency of industrialized society to compartmentalize life led to "music being listened to in concert halls, meals being consumed in restaurants, and physical activity being undertaken in gymnasiums," and art being appreciated in museums (p. 20). This classification of the senses is one example of how culture shapes sensory experience, but there are numerous examples of cultures that perceive the world differently, such as "the Batek Negrito of peninsular Malaysia, who classify virtually everything in their environment by smell" (p. 4). In Western culture, on the other hand, there is a tendency to privilege sight above all other senses (Bal, 2003; Duncum, 2012; Howes, 2014). Howes (2014) argues that this hierarchy and compartmentalization of the senses neglects a fundamental aspect of human existence:

> Sensations reinforce each other, play off each other and, at times, contradict each other as when something that looks heavy feels light or when something that smells delicious turns out to taste disgusting. They are part of an interactive web of experience, rather than each being slotted into a separate sensory box. (p. 5)

Sensory multiplicity is a basic principle in how we perceive and interact with the world. According to neurologist Oliver Sacks (2005), "there is increasing evidence from neuroscience for the extraordinarily rich interconnectedness and interactions of the sensory areas of the brain, and the difficulty, therefore, of saying that anything is purely visual or purely auditory, or purely anything" (p. 33). The interconnected webs of neurons that process sensory data are also extremely plastic and adaptable. Sacks (2005) illustrated this point by telling the stories of several individuals who suddenly lost their sense of sight during youth. The first story is of John Hull, author of *Touching the Rock: An Experience of Blindness*, for whom blindness led a "gradual attenuation of visual imagery and memory, and finally a virtual extinction of them" (p. 26). Hull eventually accepted his state of *deep blindness* and seemed "to regard this loss of visual imagery as a prerequisite for the full development, the heightening, of his other senses" (p.26). Zoltan Torey, on the other hand, resolved to develop an *inner eye* after losing sight at the age of twenty-one. With practice and training, Torey developed his capacity to mentally generate, hold and manipulate images so proficiently that he was able to replace the entire roof guttering of his home by relying on his mental visual perception of space (Sacks, 2005, p. 29). These stories, and numerous others, exemplify the unique and idiosyncratic ways individual brains process and adapt to the sensory information that they receive. Sacks (2005) states:

> One can no longer say of one's mental landscapes what is visual, what is auditory, what is image, what is language, what is intellectual, what is emotional – they are all fused together and imbued with our individual perspectives and values. Such a unified vision shines out from Hull's memoir no less than from Torey's, despite the fact that one has become 'non-visual' and the other 'hypervisual.' (p. 41)

This unified view of an individual is the theoretical foundation of this thesis. All experiences of the world are inherently multisensory and their perception is rooted in an

individual being's traits, preferences, language, education, culture, and economic class: the living being as a whole. According to this view, the experience of visual phenomena also involves hearing, touching, tasting, smelling, interpreting, thinking, loving, and hating. In this chapter, I will contextualize this research within the fields of Art Education, Contemporary Art and Soundscape Studies. The central supposition throughout this discussion will be that all experiences, including the artistic and educational, involve sensory multiplicity, rooted in the unity of an individual as a whole.

2.2 Art Education: Consciousness and the Senses

Why teach art? According to Elliot Eisner (1997), an influential advocate in the field, "the prime value of the arts in education lies in the unique contributions it makes to the individual's experience with and understanding of the world" (p. 9). The creation and appreciation of works of art can have a transformative effect on an individual's consciousness. For Eisner (2002), understanding how the arts transform consciousness requires us to start with the biological features of the human organism, for it is our sensory system that enables us to establish contact with our environment and other organisms in it. As such, the foundation of how we experience the world is rooted in this reciprocal relationship between the senses and the environment (Maturana & Varela, 1998). For human beings, this sensory system is honed by culture, through which "we learn how to create ourselves" (Eisner, 2002, p. 2). The arts are one of the powerful tools of culture, which allow us to "refine our sensory system and cultivate our imaginative abilities" (Eisner, 2002, p. 4). That is, paintings, sculptures, movies, plays, dances or books can have a transformative power on how we engage with and understand the world, because they allow us to tune our sensory awareness, and to imagine new possibilities. Education in turn is "a process of learning how to become the architect of your own experience and therefore learn to create yourself" (Eisner, 2002, p. 24). By encountering new ideas or developing expertise in a

given field, we add new layers of knowledge through which we experience the world. In this view, the arts in education have an incredibly valuable role to play in transforming consciousness by engaging the senses and influencing how we hear, see, smell, taste, feel, and live in the world.

For Eisner (2002), one of the crucial components of the transformative power of the arts is representation since what and how we represent reveals our choices about what aspects of the world will be experienced. He suggests three modes of representation that are common to all the arts, and are particularly relevant for the visual arts. Firstly, mimesis refers to forms that resemble the aspect of reality that is being represented. In Renaissance painting, for instance, perspective was used to give an illusion of three dimensions on a two-dimensional surface, mimicking how the eye perceives space from an individual's subjective point-of-view. In classical Chinese painting, on the other hand, space was represented in a completely different way. *Departure Herald*, for example, is an imposing panoramic scroll painting, measuring over twenty-six metres in length, which chronicles a Ming Dynasty emperor's procession through the countryside. The viewer is not expected to perceive the painting in its entirety, but rather unscroll it section-by-section, thereby travelling through the landscape and uncovering the narrative within. Although both Renaissance and Chinese landscape paintings aim to mimic reality, they are rooted in conventions that guide sensory experience in different ways to achieve mimesis. For Eisner (2002), a second mode of representation is the expressive form, by which he is referring to the representation of emotions through line, colour, shape, value, texture, and composition (p. 17). While these elements are present in most paintings, the abstract paintings of Wassily Kandinsky can be pointed to as examples of work that explicitly implement these elements to convey feelings. Finally, conventional signs are the third mode of representation, which refer to socially agreed-upon symbols that have social, cultural and political resonance. The iconoclastic renditions of the American flag by Jasper Johns illustrate how artists can re-contextualize these

familiar signs "to awaken us from our customary modes of perception" (Eisner, 2002, p. 18). Combinations of these three modes, to varying degrees, are employed in not only the visual arts, but also across the arts. For instance, the theatrical operas of Richard Wagner are mimetic in that they convey a narrative, expressive in that they invigorate the narrative with provocative music, and iconic in that they rely on conventional cultural symbols through which the narrative is understood. While these three modes are invaluable for the creation and appreciation of a great deal of the arts, there are also numerous examples of work that cannot be fully described in such terms. For instance, when Fluxus artist Allan Kaprow filled the Sculpture Garden at Martha Jackson Gallery in New York with used tires in his 1961 installation *Yard*, the tactile and multisensory experience of moving through the space was the artwork. This installation is not referring to any aspect of reality outside of the experience itself, and therefore, the embodied experience of occupying a particular space is the fundamental characteristic of this work of art. Eisner (2002) points out that embodied knowledge is fundamental for all works of art, even for visual work that can be characterized by his three modes of representation:

> Some images resonate with our gut, others with our eyes, still others with our fantasies…some visual images are essentially tactile experiences….The fact that an image is visual does not mean that the experience we have of it will be visual. All of us have synesthetic experience. In a sense, all these capacities for human experience are resources the artist can call upon in the crafting of the image. (p.19)

Building on these ideas, I argue that Art Education should not limit itself to the crafting of images, or different modes of representation. Since embodied experience is the seed of all artistic expression, the value of the education of visual arts can expand beyond the study and creation of visual objects to include diverse aspects of human experience. A more enriching and complete understanding of our experiences can emerge if we remember that we are conscious beings who

experience the world through a sensory system, which has been shaped by culture. As culture shapes consciousness, it is imperative to study a wide range of culturally recognized objects, ideas and symbols that influence the contemporary world. This includes, but is not exclusive to, canonical works of art as well as ordinary objects, ideas and experiences that we encounter every day. There is currently a great deal of sympathy for this view in the field from those who aim to expand the field to the study of visual culture, material culture and contemporary art.

2.2.1 Visual Culture Studies

In recent years, the inclusion of popular visual culture in art curricula has emerged as a focal point of investigation and discussion in Art Education. Its proponents sought to expand the content of study to include contemporary cultural forms such as television, magazines, and the Internet (Chalmers, 2005; Efland, 2004; Tavin & Anderson, 2003). While the integration of popular visual culture may have led to an increased relevance of Art Education in today's media-saturated environment, an important aspect has often been neglected: visual culture is not exclusively visual (Bal, 2003; Duncum, 2012). Paul Duncum (2004) pointed out that these media incorporate images, texts and sounds in order to convey messages, and he advanced the term *multimodality* to better understand how to study this phenomenon. Considering the multimodality of contemporary media, the term *Visual* Culture Studies seems to distort the prominence of the sense of sight over sound and text. In the field of Visual Culture Studies, there is a growing recognition that sight cannot be isolated from other senses. Cultural theorist Mieke Bal (2003) suggests that privileging vision over other senses is a form of *visual essentialism* and pointed out that the act of looking is profoundly "impure" because it involved a range of sense-based activities such as listening, reading, tasting and smelling; "hence, literature, sound and music are not excluded from the object of visual culture" (p. 9). In a recent special issue of the *Journal of Visual Culture*, the theme of theorizing sound in Visual Culture was at the forefront. Some of the

divergent topics in this issue include a discussion of the uncanny intangibility of sound (Toop, 2011), the need to develop theoretical models beyond notions of representation (Cox, 2011), and the introduction of new vocabulary for discussing sound (Oliveros, 2011). This seems to suggest that while the topic of sound is currently under-theorized, there is a growing interest in its theorization and taxonomy.

2.2.2 Material Culture Studies

Other theorists in the field of Art Education identify the privileging of the visual as a serious shortcoming. Art educators Paul Bolin and Doug Blandy (2003) argue Material Culture may be a more fitting approach to Art Education in the contemporary world:

> We argue our reluctance to embrace a position that favours the visual sense over other sensory receptors. It is critical to recognize that our current multimedia world is expanding rapidly towards multi-sensory experience. It may be that if art educators continue to privilege visual objects and/or visual experience, which is characteristic of visual culture studies, our students and the field will be susceptible to manipulation through our other sensory modalities. In this, our field will continue to perpetuate the disciplinary and sensory boundaries that fail to encourage holistic and systemic understanding of experience. (p. 247)

Paul Bolin and Doug Blandy (2003) propose seven statements in support of Material Culture as a more "holistic and systemic understanding of experience" than visual culture. Three of these statements are particularly relevant to this research: material culture "describes all human-made and modified forms, objects, and expression manifested in the past and in our contemporary world" (p. 249); it "strives to be inclusive and does not privilege the visual sense over the other senses" (p. 254); and it aims to study "commonplace objects, forms, and expressions that people in the past and present experience on a daily basis" (p. 252). Sights,

sounds, smells, tastes, objects, forms and expressions that one encounters every day are objects of examination. Common everyday experiences can be explored creatively, and this exploration is not confined to sight. In this view, soundscapes of everyday environments, which are influenced by human activity, can be objects of investigation and creative exploration. Furthermore, the acts of listening and recording these soundscapes involve moving through space, looking, smelling, touching and interacting. Soundscapes are inherently multisensory experiences, and their study benefits from a multi-disciplinary perspective that draws on fields that account for the auditory, visual, tactile, cultural and communicative aspects of experience. The field of Material Culture Studies opens the door for the practice of listening, recording and editing everyday soundscapes in art classrooms by arguing for a multisensory and interdisciplinary study of all modes of human expression.

2.2.3 Contemporary Art in Art Education

Multisensory and interdisciplinary approaches to art-making are common practice among contemporary artists who explore the tactile, olfactory, and aural and the intersection of these senses in performances, installations, sculptures and other media (Bal, 2003; Duncum, 2012; Wilson, 2003). Art educator Brent Wilson (2003) pointed out that when looking through an edition of *Artforum* magazine, it is possible to see paintings and sculptures as well as installations, performances, video art or conceptual art, which in many respects are "indistinguishable from journalism, television, cinema, illustration, the popular arts, and the objects and events of everyday life" (p. 218). Wilson (2003) argues that expanding the field of Art Education to include these contemporary art practices would have tremendous educative benefits as contemporary artworks "are of our time and they hold the possibility of informing us...about our contemporary lives, they probe and problematize contemporary society, and they raise issues pertaining to our values and our aspirations" (p. 217). Contemporary art has been

deeply influenced by trends in the contemporary world. For one, multimedia and multimodal technologies pervade in our homes as well as art museums and galleries. The web and mobile technologies have made it possible to experience images, sounds, and ideas with the touch of a fingertip. Due to the growth of digital and web art on the Internet, "the artworld can no longer be defined solely by the works that find their way into museum collections" (p. 218). Contemporary media and technology can also have powerful implications for Art Education. Most notably, we are constantly being bombarded by virtual images, sounds and text, which nowadays are an integral part of our being in the world. Technology is changing our sensory experience. Eisner's assertion that art education can "refine our sensory system and cultivate our imaginative abilities" is especially pertinent in today's media-saturated world (Eisner, 2002, p. 4). By teaching contemporary approaches to art that are multimodal, interdisciplinary and multisensory, art educators can provide a venue for deepening sensory awareness, and exploring sensory multiplicity. In this light, teaching soundscape compositions in visual arts classrooms can deepen awareness of ambient sounds through the act of deep listening, and provide opportunities to explore sensory multiplicity by using technology to record, edit, and combine sounds with other media. Art educators can also draw inspiration from a rich history of interdisciplinary artistic practice of avant-garde and contemporary artists who use sound in conjunction with various media.

2.3 Sound Art

The modern era museums emerged in the nineteenth century as "eyes-only" spaces, where people were expected to passively contemplate a work of art by looking at it, and never touching it (Howes, 2014, p.19). Technologies such as photography have further facilitated an acceptance of a single-sensed view of art by presenting the world primarily, and convincingly, to our eyes. The notion that sight can be separated from other sensory experiences also had a profound impact

on how the arts have been theorized. For influential art critic Clement Greenberg (1986), paintings, sculptures, musical compositions or literature ought to strive for purity, which "consists in the acceptance…of the limitations of the medium of the specific art" (p. 32). According to this view, a painting is exclusively visual and a musical composition auditory, and there cannot be any confusion between the two. On the one hand, Greenberg's ideas have inspired a number of abstract painters and sculptors who have thoroughly investigated the formal qualities of their receptive media to produce stunning works of art. On the other hand, this view of art misses one basic point: our experience of the world, and by extension, works of art, is rooted in being inside a body in a physical space at a particular time. This means that when you are standing inside the Museum of Modern Art in front of a Mark Rothko painting, the sounds and smells in the gallery and the voices of other people in the space also affect how the painting is experienced and understood. From this point of view, separating sight from other aspects of embodied experience is limiting for both the appreciation and creation of a work of art.

2.3.1 Non-retinal Art, Sound Poetry

While the mainstream art world in the nineteenth and twentieth centuries emphasized the visual character of art, there were numerous examples of artists exploring sensory multiplicity and utilizing non-visual sensations. One instance of this is Marcel Duchamp's rejection of retinal art. In a BBC interview Duchamp explained that his dismissal of many of the art movements of his period was due to their exclusive preoccupation with sight, which "adds nothing intellectual" (Liu, 2013). As an answer to retinal art, Duchamp created the *readymade*, which were ordinary manufactured objects modified by the ideas of the artist. When a snow shovel is placed in a gallery and titled *In Advance of the Broken Arm*, the artistic experience is the implied narrative rather than merely the physical object that is seen. This intellectual approach has had far-reaching implications for artistic practice by suggesting that art-making is not exclusively about making

beautiful-looking objects, but rather about how we choose to perceive things in the everyday world.

During the same time period, Dadaist artists were gathering at Cabaret Voltaire, a nightclub in Zurich, and experimenting with the boundaries of art. In this setting, artists, musicians, poets, thinkers and political revolutionaries mingled and collaborated on new forms of performance. On one evening in 1916, Hugo Ball stood before the audience and recited a poem called "Gadji Beri Bimba." This sound poem is composed of phonetic fragments that have no linguistic meaning: "glandridi laula lonni cadori" and "zimzim urullala zimzim urullala zimzim" (Rumens, 2009). When these lines are vocalized, the voice of the reader creates the rhythm, cadence, tones and textures. By removing meaning from speech, these sound poems stress the musical qualities of the human voice, yet they cannot be considered music, in the conventional sense. Futurist artist Filippo Marinetti also used sound poetry to express his vision of a world of machines, speed, and war. "Zang Tumb Tumb" (1914) is a sound poem that combines Marinetti's onomatopoetic representation of destruction with visual concrete poems that use typography to convey rhythm, cadence, tones, and textures. In this work, sound, image and text are combined to tell the story of a battle during the First Balkan War. During the same time period, a contemporary of Marinetti, painter and composer Luigi Russolo, constructed noise machines—called *Intonarumori*—that produced sounds resembling industrial noise. These devices were assembled and used by orchestras at Russolo's noise concerts. Sound poetry and Intonarumori share the characteristic of existing in the borders of various media, and not fitting neatly into conventional categories of visual arts, theatre or music. In fact, this interdisciplinary approach to art-making has been part of the practice of various artists since the early years of the twentieth century.

2.3.2 The Fluxus and Intermedia

In 1965, poet, composer and painter Dick Higgins (2001) wrote:

> Much of the best work being produced today seems to fall between media. This is no accident. The concept of the separation between media arose in the Renaissance. The idea that a painting is made of paint on canvas or that a sculpture should not be painted seems characteristic of the kind of social thought. (Higgins & Higgins, p. 49)

Higgins coined the term *intermedia* to describe the work of a group of artists known as the Fluxus who were working mostly in New York in the 1950s and 1960s. Many of the works of Fluxus artists do not conform to a pure medium, but exist as an *intermedium* of sound and poetry, or performance and painting, for example. For Higgins, the blurring of boundaries is not limited to artistic media, but also applies to the boundaries between art and life—a notion inspired by Duchamp's act of exalting everyday objects as works of art with his readymades.

2.3.3 John Cage and Silence

A central figure in the Fluxus movement was John Cage, whose radical ideas about music, philosophy, and art inspired artists who were interested in crossing and combining various media and senses, and wiping the line in the sand between art and life (Kirby, 1969). Perhaps, one of Cage's most resonant gestures for expressing his ideas, with far-reaching implications not only for musicians but also visual artists, is his infamous composition 4'33":

> At its first performance, virtuoso pianist David Tudor sat at the piano, opened the keyboard lid, and sat silently for thirty seconds. He then closed the lid. He reopened it, and then sat silently again for a full two minutes and twenty-three seconds. He then closed and reopened the lid one more time, sitting silently this time for one minute and forty seconds. He then closed the lid and walked off stage. That was all. (Pritchett, 2009, p. 167)

With this act, the ambience of the concert hall had become the musical composition, and the boundaries of music had opened up to include the sounds of people's feet shuffling on the floor, coughing, sneezing, whispering, the buzz of traffic outside, and the hum of fans and radiators inside. With this act, Cage equated music to sound, and sound to silence. Cage (1961) expresses his vision for a new philosophy of music and art as such:

> For in this new music nothing takes place but sounds: those that are notated and those that are not. Those that are not notated appear in the written music as silence, opening the doors of music to the sounds that happen to be in the environment. This openness exists in the field of modern sculpture and architecture. The glasshouses of Mies van der Rohe reflect their environment, presenting to the eye images of clouds, trees, or grass, according to the situation. (p. 8)

By introducing silence to music, Cage shows that sounds in the environment are always a component of the musical experience and "if sound is ever present, so are the other senses…Cage has gone so far as to deny the existence of music itself, if music is considered as hearing isolated from sight, touch, smell" (Kirby, 1969, p. 19). Music is not just sound. The appearance of the conductor and the smells in the auditorium are also part of the experience of being inside a body in a physical space at the moment of hearing sounds. By opening the doors of music in this way, the context in which an artwork is experienced is indispensible to the artwork. Accordingly, the world surrounding art is integral to art, and art and life bleed into and feed each other. Cage's ideas were inspirational to musicians, poets, playwrights, painters and performance artists of his era whose artwork aimed to maintain openness to the environment and the people in it. These ideas have also had a lingering influence on the artistic practices of a number of musicians, performers and visual artists working today.

2.3.4 Brian Eno's Ambient Music

For contemporary musician, visual artist and pioneer Brian Eno, the notion of music blending into life has inspired him to conceive of a new type of music he calls *ambient*. Eno tells the story of sitting in Cologne Bonn Airport in Germany, looking around and listening to the space, and imagining a kind of borderless music that would blend into the atmosphere, and fill the space, so that "everything you could hear could be music, even things that weren't on the record" (Thiesen, 2011). Eno's approach to music portrays an awareness of the impact of the environment in which music is heard as well as the general state of the listener on how music is experienced. In the liner notes for his ambient album *Music for Airports*, he writes:

> Whereas the extant canned music companies proceed from the basis of regularizing environments by blanketing their acoustic and atmospheric idiosyncrasies, Ambient Music is intended to enhance these…Ambient Music must be able to accommodate many levels of listening attention without enforcing one in particular; it must be as ignorable as it is interesting. (Eno, 1978)

In both Cage's and Eno's work, the definition of music was expanded to include ordinary sounds that happen to be in the environment, and the listener plays an active role in the experience. The act of listening is not isolated from any other activities the listener is doing—sitting, walking, seeing, smelling, thinking, breathing—it is an integral part of being in a space. These works are open to sensory multiplicity and defy easy categorization as music or art. Interestingly, both artists experimented with visual media as well—John Cage with painting, and Brian Eno with video paintings that complement his ambient soundscapes.

2.3.5 Contemporary Art, Janet Cardiff

Today, there are a number of artistic practices that exist in the in-between spaces of music and art including experimental music, ambient music, sound sculptures and soundscapes (Licht,

2007). According to art critic Polly Ullrich (2011), the practice of working with sound has become almost ubiquitous in contemporary art. For Ullrich (2011) the spatial and embodied qualities of sound resemble that of sculpture, which is "situated within the sensibilities of space, embodiment, and the physical work" (p. 35). The implementation of sound in installations and performances gives artists a powerful tool to expand the boundaries of the here and now.

> Even as sound amplifies corporeality and defines space, it pushes sculpture further into expansive, experiential forms. Its liveliness literally embodies the flow of passing time. Entwined in the fleeting moment, it hovers between being and non-being, collapsing the duality of the present and the absent. (Ullrich, p. 36)

Numerous contemporary video, sound, and installation artists utilize sound for its ability to transform a space. One notable example of this is Canadian artist Janet Cardiff, whose installations use sound in conjunction with light, images, and kinetic sculptures to create immersive environments. One of her better-known works is *The Forty Part Motet*, which has been installed at The Metropolitan Museum of Art, The National Museum of Canada, and numerous other places. In this work, the voices of individual members of a choir were recorded separately and played back through a series of speakers, which were arranged in a circle so that the spectator could walk around and experience a choir in a different way. In this work, attention is given to the subjective and spatial aspects of experiencing a choir singing Thomas Tallis's 1573 composition, *Spem in Alium*:

> With this piece I want the audience to be able to experience a piece of music from the viewpoint of the singers. Every performer hears a unique mix of the piece of music…As well, I am interested in how sound may physically construct a space in a sculptural way and how a viewer may choose a path through this physical yet virtual space. (Cardiff & Miller, 2001)

Cardiff allows her audience to create their own unique composition by moving within a defined space. She uses technology to restructure the experience of listening to a choir, thereby amplifying the spatial, embodied and physical nature of this musical composition. This installation exists in between music and sculpture, and defies the categorization of visual art as merely visual, or music as merely sonic. Cardiff's work stands out as one example among many contemporary artists who explore the multiplicity of sensory experience with artworks that are inherently interdisciplinary.

Cardiff's sound installations, sound poetry, and intonarumori, along with Cage's experimental music, and Eno's ambient music are some pertinent examples of interdisciplinary works that integrate sound as a central component. These divergent practices can fall under the umbrella term *sound art*, which encompasses a range of interdisciplinary and multisensory practices. The interdisciplinary nature of these practices suggests that sound art is not the exclusive domain of art or music education, but rather exists in a stimulating liminal space between these disciplines.

2.4 Soundscape Studies

Salient examples of the use of sound in modern and contemporary art can contextualize this research within art classrooms. However, the aim of this research is to develop specific educational interventions in the process of listening, recording and editing sound through which participants gain a deeper awareness and appreciation of environmental sounds. To this end, the field of *Soundscape Studies* provides pertinent insights and strategies for deepening aural awareness and enriching our relationship to the environments we inhabit as modern people. Soundscape Studies, founded by Murray Schafer from Simon Fraser University, is a discipline that explores the sonic environment and omnipresent array of sounds that define our daily lives. In the 1970s, Schafer established a research and educational group called the World Soundscape

Project, which documented and analysed the sonic environments of various locations. In one of their research projects, members of the group travelled to Europe, documenting the soundscape of five small villages (Davis, Truax & Schafer, 1977). By listening, recording and notating the ambient sounds of these communities and comparing this data to historical records, they were able create a portrait of the rhythm of life, and demonstrate changes in the soundscape and living patterns of the inhabitants due to modernization. For Schafer (1977), the deep interconnection of people and to their environmental soundscapes is a fundamental aspect of the human experience. This is an ancient relationship as the voices of the sea, wind, birds, insects, wildlife, and livestock have defined the rhythm of life and the seasons, and inspired art, music and literature throughout the ages. However, with the advent of industrialization and mass urbanization, there has been a notable shift in our everyday sonic environments, which have been transformed from *hi-fi* to *low-fi soundscapes*. Schafer (1977) describes the hi-fi soundscape as "one in which discrete sounds can be heard clearly because of the low ambient noise level" whereas in a low-fi soundscape "individual acoustic signals are obscured in an overdense population of sounds" (p. 43). This suggests that in industrialized societies there is a cacophony of sound that we tune out, and as a result, our relationship to sound has been irrevocably impaired. This has been further exasperated by the electric revolution, which enables devices such as phonograms, telephones, televisions and computers to broadcast sounds outside their original context. Schafer (1977) coined the term *schizophonia* to describe the phenomenon where there is a "split between an original sound and its electroacoustical transmission or reproduction" (p. 90). Schafer (1977) makes a passionate plea for raising awareness of the transformations that have occurred to everyday soundscape due to technology:

> When the rhythms of the soundscape become confused or erratic, society sinks to a slovenly and imperilled condition….The soundscape is no accidental byprodcut of

> society; rather it is a deliberate construction by its creators, a composition which may be as much distinguished for its beauty as for its ugliness. When a society fumbles with sound, when it does not comprehend the principles of decorum and balance in soundmaking, when it does not understand that there is a time to produce and a time to shut up, the soundscape slips from hi-fi to lo-fi condition and ultimately consumes itself in cacophony. (p. 237)

Schafer is suggesting that our soundscapes are a fundamental aspect of our being in the world, and as conscientious citizens of the world we must take action to create decorum and balance in our soundmaking activities. Artists and educators can play an important role in this by raising awareness of environmental sounds by creating interventions for a particular soundscape. One such intervention is the soundwalk, which may involve exploring particular areas by attentively listening to every sound in the environment. This is a pivotal aspect of the research of contemporary soundscape artist and scholar Andra McCartney (2005), who engaged in a soundwalk within defined areas around the Lachine Canal in Montreal, for example, in order to document the voices of francophones, anglophones, factories, cyclists, cars, birds and flowing water. For Hildegard Westerkamp (2007), however, the act of soundwalking is about "exposing our ears to every sound around us no matter where we are" (p. 1). We can open our ears and listen to a crowded street corner, a bustling train station or the silences in the private spaces of our homes. One method of enabling a deeper level of listening is the tactic of imagining the ear as a microphone and the microphone as the ear, which causes a shift in the perception and reception of a given environment (Westerkamp, 2002). These strategies for facilitating deeper awareness of everyday sounds, which enable deeper engagement with quotidian environments, have been instrumental in my own practice as an artist and educator. The central concern of this research is

to tune in the world around us with our ears. This is a project that has strong antecedents in the work of Schafer, Westerkamp, McCartney and others in the field of Soundscape Studies.

2.5 Conclusion

Returning to the original question of what the visual arts have to do with sound, it should be evident at this point that there is a significant body of work that exists today that is not confined to the limitation of what is visible or auditory. There are also numerous precedents of this in art movements of the twentieth century—sound poetry, Intonarumori, fluxus happenings—as well as contemporary practice—experimental music, ambient music, sound installations and soundscapes—which incorporate the sense of hearing in significant ways. The common theme among the various practices that have been discussed is the relation of sound to space. Particularly, the field of Soundscape Studies examines the relationship of human beings to their everyday environments, providing applicable strategies for educational contexts. This exploration of sound, however, is rooted in an understanding of a human being as a unified entity that integrates a multitude of senses to bring forth knowledge and understanding. As such, hearing is not segregated from any other aspect of embodied experience. On the contrary, the act of listening deeply and engaging in the process of composing soundscapes focuses our awareness on our bodies and minds within space.

In the next chapter, I will present the theoretical framework of the thesis, which relates the creative process of composing soundscapes to philosophical questions on consciousness. The central principle of this framework is that we are unified beings who integrate a flood of internal and external stimuli to arrive at the unique state we call consciousness. In this sense, the act of listening is an integral and inseparable part of an individual as a whole, and the artistic exploration of creating soundscapes is inherently multisensory and embodied. Engaging in this process can have a transformative influence on our consciousness by calling us to tune in the

sounds that we usually tune out. To illustrate this, I will draw on my own artistic practice, which has been deeply influenced by the theoretical framework of consciousness.

Chapter 3: Theoretical Framework

3.1 Introduction

The theoretical framework for this thesis originated in my artistic exploration. When I first began using recording devices to record sound and listen deeply to my surroundings, I became aware of my lack of awareness of the sonic ocean in which I was submerged. Seeking an explanation for why this had been the case has inspired me to explore literature on consciousness. Consciousness is inherently a multifaceted phenomenon, requiring a multi-disciplinary approach for its understanding (Chalmers, 2010). Its exploration can incorporate a variety of quantitative and qualitative domains such as information theory, artificial intelligence (Norretrander, 1999); biology and complexity theory (Maturana & Varela, 1998); and cognitive neuroscience and cultural anthropology (Donald, 2001). These varied domains offer fascinating insights that reveal the ear to be an integrated part of a highly selective consciousness-creating mechanism that has been evolving for millennia and conditioned by culture. The central questions explored in this chapter are what is the nature of human consciousness and how does it affect how we experience the auditory world. While theoretical readings provide the framework for this exploration, the acts of listening, recording and editing sounds have offered me practical means of thinking through these questions. Due to this reciprocal relation between theory and art making, I draw on my experiences to elucidate key aspects of human consciousness.

3.2 Consciousness and Soundscapes

Imagine yourself walking to the grocery store. You are concentrating on the road ahead and thinking about your destination. Meanwhile, sounds from all directions are streaming into your ears; light is entering your pupils and touching your retina; the wind is caressing your skin and entering your noise and mouth. At that moment, your motor cortex, the part of your brain responsible for movement, is coordinating your arms and legs to swing together while an electric

ballet is taking place in the ancient chambers of your brainstem, which is orchestrating the pulse of your heart, inflation and deflection of your lungs, the flow of blood in the veins. Outside, there are cars driving, some of them blasting music, others screaming at cyclists who are weaving their way through the cars. There is a red light ahead where you must stop. Behind you, there are two Vietnamese women talking in a language you cannot understand while you are thinking about green peppers, onions, chips and the other items on your grocery list, and also about a conversation you had earlier with your roommate about where to put the organic waste. This is a fairly typical quotidian experience, where there are millions of things happening inside and outside, most of which you are experiencing unconsciously or semi-consciously.

Now imagine yourself in the same context, but try this: stop moving, close your eyes and listen. What sounds do you hear? Traffic, sirens, birds, music, children, bicycles, your breath and what else? In fact, you can try this exercise right now as you are reading this. Pause. Listen. What do you hear? Are you noticing new sounds? It has been my experience that when I pause and listen, I hear more or at least I hear differently. This exercise demonstrates that we are usually aware of a modest proportion of what is happening inside and outside us, yet we can automatically function in our habitual ways. We can also tell ourselves to focus all our awareness on one act: listening, thereby disrupting habitual patterns and experiencing a different kind of awareness. Deep listening is an act of reflecting not only on the sounds around us, but also on ourselves and how we live in and experience the world. Deep listening can also become part of daily life in mundane acts like walking to the grocery store. It is only a matter of reminding yourself to listen and notice. Coupled with theoretical insights on consciousness, engaging in the act of deep listening can be a potent tool to reflect on our behavioural habits in everyday environments. For me, the most powerful aspect of engaging in an artistic process of composing soundscapes has been its residual effect in my everyday life. Often, I remind myself to listen.

3.3 Listening, Recording; the Me, Exformation

I began engaging in the creative process of composing soundscapes during the winter and spring of 2012, when I spent a great deal of time walking around and recording the sounds of birds, traffic, metro stations, buskers, children playing and rivers flowing in the city of Montreal with powerful directional microphones that could focus in and amplify sound. Walking around and listening to familiar spaces with headphones is markedly different from usual perception of environments. Your sense of hearing is heightened, and it is possible to hear numerous sounds that ordinarily blend into the background. For instance, I could hear water melting under a layer of snow on a warm winter day, or point the microphone toward the ground while walking and hear my shoes grinding the snow. This experience heightened my appreciation and sensitivity to the sounds around me even when I was not using these devices. I began noticing shifts in my daily habits such as not using headphones to listen to music when I was in a pleasant sonic environment or avoiding excessively noisy places. Moreover, using technology to intensify and direct my perception of sound became a means of reflecting on my conscious awareness of the external world.

One clear insight gained from this act of listening and recording is that we filter out the vast majority of acoustic information in our environments from conscious awareness, yet we can usually tune in any sound if it is necessary to do so. For instance, when you are in a crowded room, focusing on the voice of your friend while filtering out all other conversations. Suddenly another person calls out your name and you are instantly able to localize the sound and turn your head in the direction of the source. This phenomenon known as *the cocktail party effect* (Cherry, 1953) illustrates that the ear is able to take in numerous sounds without our awareness, yet mainly the sounds that are relevant to the listener are noticed. This is one of the many complex problems the ear has to solve in everyday life. In order to get a sense of the full range and

complexity involved in auditory perception, psychologist Albert Bergman (1990) suggests a thought exercise:

> Imagine that you are on the edge of a lake and a friend challenges you to play a game. The game is this: your friend digs two narrow channels up from the side of the lake. Each is a few feet long and a few inches wide and they are spaced a few feet apart. Halfway up each one, your friend stretches a handkerchief and fastens it to the sides of the channel. As waves reach the side of the lake they travel up the channels and cause the two handkerchiefs to go into motion. You are allowed to look only at the handkerchiefs and from their motions to answer a series of questions: how many boats are there on the lake and where are they? Which is the most powerful one? Which one is closer? Is the wind blowing? Has any large object been dropped suddenly into the lake? (p. 5)

While this may seem impossible, Bergman (1990) asserts these are precisely the kinds of problems our eardrums are solving when deciphering how many people are in the room, who is talking, who is louder, who is nearer and whether a machine is humming in the background. Many of these problems are solved without our conscious awareness. The ear receives a flow of information from sound waves reaching the eardrums, yet we are only aware of the few sounds that matter to us. This is a key characteristic of consciousness as described by Tor Norretranders (1999), whose work draws on the language of computers and Information Theory to explore how much, or how little of human life can be considered conscious (p. x). The central thesis of this work is that the person we identify as our conscious self plays a relatively minor role in our daily activities, and concepts such as *the I* and *information* need to be understood in the contexts of the notions of *the me* and *exformation*. The term exformation is related to the work of Claude Shannon, founder of Information Theory and an engineer at AT&T's Bell Laboratories. The

central problem this work dealt with was how to transmit information through telephone lines without requiring exceedingly thick or heavy wires. Only the minimal and most essential bits of information needed to be transmitted, and furthermore, the communication system needed to take into account loss and damage to data in the transmission. The same principles apply today to MP3 or JPG files, which compress data by discarding unessential information. In contexts where information is discarded, exformation is essential for comprehending the message.

> Exformation is about the mental work we do in order to make what we want to say sayable. Exformation is the discarded information, everything we do not actually say but have in our heads when or before we say anything at all. Information is the measurable, demonstrable utterances we actually come out with. The number of bits or characters in what is actually said. (Norretranders, 1999, p. 95)

Accordingly, "what is said" is the smallest amount of information, which is given meaning by vast amounts of exformation implicitly understood by the listener. Norretranders (1999) applies the concepts of information and exformation to consciousness by quantifying the operational activities of the brain as bits, which are defined as units "of measurement for information that express our ability to distinguish among differences"(p. 131). Citing the research of Karl Kupfmuller, a professor at the technical university in Darmstadt, and Helmuth Frank, a professor at the Institute of Cybernetics in Berlin, Norretranders (1999) posits the rates of our conscious awareness to be between 16 to 40 bits a second compared to the millions of bits of sensory information that are taken in every second (p. 138–139). The total bandwidth of the eyes is 10,000,000 bits/sec compared to 40 bits/sec for conscious awareness; this number is 100,000 to 30 bits/sec for the ears (p. 143). This would indicate a great deal of our perception and activities in the world are not conscious, since the bandwidth of conscious perception is so narrow. In other

words, “consciousness consists of discarded information far more than information present” (p. 127).

One must caution that quantifying consciousness does not provide a full account of it. “Information is not a particularly good measure of consciousness. Information tells us no more about consciousness than the number of food calories required tells us about a ballerina’s pirouettes” (p. 127). Warren Weaver, a co-founder of information theory, makes this point clear by distinguishing among three levels in communication theory: “a technical level, a semantic level, and a behavioural level. The technical involves the transmission of symbols of communication – i.e., the practical application of what Shannon’s mathematical theory describes” (p. 99). Therefore, while representing the brain’s activities as numbers can give a sense of how the nervous system is interacting with its surroundings, it does not account for how this information acquires meaning and affects behaviour. However, Norretranders’ (1999) account provides a significant insight for our understanding of consciousness: “every single second, every one of us discards millions of bits in order to arrive at the special state known as consciousness” (p. 125).

This discarded information is essential for our conscious experiences and behaviour. One way to see the impact of exformation on behaviour is to scrutinize a number of daily activities such as driving in traffic, brushing one’s teeth or more simply walking and talking. Very little thought is given to how we swing our arms while we walk or how we string various sounds together to construct words, and words to make sentences. In these instances, our behaviour is guided by automatic reflexes, which have developed through learning and habituation. We do not have to think about the mechanics of these actions. In more skilled and challenging pursuits, repetitive training of a set of actions can allow us to spontaneously react effectively. For instance, when an athlete like Lionel Messi plays in the World Cup final, he has to constantly make split

second decisions as to how to react to a ball that has been sent his way. Years of repetitive drills are at play the moment he touches the ball, and these instantaneous decisions demand an instinctive response. "A soccer player does not have time to think consciously while he is on the field. Things just move too fast" yet "there is a great deal to think about. The ball, the players, the state of the field" (Norretranders, 1999, p. 251). In order to react spontaneously to such complex situations, a soccer player must have developed complex patterns in the nervous system, yet must do something creative and novel. To explain how an individual can react instinctively while being mindful of countless factors, Norretranders (1999) suggests that we must distinguish between *the I* and *the Me*.

> *I* am not identical with *Me*. *Me* is more than my *I*… The *I* is the conscious player. The *Me* is the person in general. The *I* is not at the wheel in many situations; when urgency is required, for example. The *I* is in charge of lots and lots of situations where there is time for thought. But there is not always time. (p. 258)

This notion of *the Me* has a great deal of relevance for artistic practice as well. On the one hand, this concept is complimentary to the notion of *flow* that has been proposed by behavioural psychologist Mihaly Csikszentmihalyi (1990). Csikszentmihalyi proposes this term as a common state of mind that is reached by artists, athletes, scientists and any other specialists who experience instances of being completely immersed in the task they are performing. This state of mind—flow—is reached when one is performing a highly skillful activity that one finds challenging. That is, the task at hand draws on a reservoir of learned automatic responses, while at the same time presents novel and creative challenges that demand full concentration. In such instances, the practitioner experiences a sense of a loss of self-consciousness when the concept of self slips below the threshold of awareness, which can lead to self-transcendence and a feeling of expanding the boundaries of the self (Csikszentmihaly, 1990). In terms of information theory,

we can describe this state as one where the bandwidth of consciousness shifts and expands to include automatic behaviours that have been learned through vigorous training, which leaves very little room for thinking about anything other than the task at hand. In other words, *the I* disappears into *the me*. I can certainly report experiencing this phenomenon while painting, for example, where I felt so thoroughly absorbed by the colours and lines on canvas that I completely lost any sense of time, my thoughts or myself. One of the most gratifying aspects of creating soundscapes has also been an experience akin to the loss of self-consciousness that Csikszentmihaly described. When I turn the narrow spotlight of my conscious awareness toward the sounds around me, I feel that my conscious self is dissolved, giving rise to a different mode of consciousness that encompasses a vast ocean of sound waves in which I am immersed. In this sense, the boundaries of my being are being pushed forward.

On the other hand, Norretranders' notion of *exformation* suggests a very different approach to creativity in the process of listening and recording sounds. While *flow* relies on finding the optimal balance between learned skills and novel challenges, the creative process I am suggesting is about unlearning automatic behaviours by concerting on *exformation*. The act of listening is an automatic response that is trained and developed throughout human life. One instance of how learning affects hearing is the voices of other people, which have a tendency to hold our attention above other auditory stimuli. In a classroom, for example, the sounds of pencils tapping on desks, feet shuffling, students coughing and the ventilation system are all present, but our focus is typically directed to the person speaking in front of the room. I am asserting that turning our attention to all those other sounds teaches us a great deal about how we are conscious in this world. This act of concentrating on auditory exformation disrupts our behavioural habits of listening by forcing us to pay attention to stimuli that our ears constantly absorb, yet rarely focus on.

> When we are aware of an object outside ourselves, we use all our senses at once and combine information…without being aware of the individual sensory modalities. But if we have to listen for a moment, we shut our other senses out of our consciousness. We close our eyes in order to listen hard. We can direct our attention and consciousness at an object or at a sensory modality: all our senses at one thing, or one sense at everything. (Norretranders, 1999, p. 130)

3.4 Inside, Outside; Autopoietic Unity

In the summer of 2012, most of my leisure time was spent cycling in different parts of Montreal with a recording device and Norretranders' book in my backpack. I would stop next to a river to record its sounds, or park under the shade of a tree to read. The microphone and active listening became my way of thinking through the ideas I was reading. On one occasion, I sat on the bank of Saint Lawrence to record sound with a powerful directional microphone. I pointed this microphone at a section of the river and heard it amplified; I heard individual waves crash against a rock and thumps that originated underwater. I was able to perceive imperceptible sounds and focus on sounds that had previously escaped my awareness. Due to the amplification of these sounds, listening with this device led to strikingly different experiences from what I had been accustomed to. The bandwidth of my consciousness was flooded with information, which in normal circumstances would not have been noticed. When we augment our hearing with a technological device, we experience the world differently. Such different sensory experiences can offer valuable insights for understanding quotidian experiences. For one, we can deduce that our experiences of the world are shaped and coloured by the mechanisms that detect sensory information: the ears, eyes, nose, tongue, skin, et cetera. Listening is not merely an objective representation of the sounds out there in the world, but rather a subjective experience that

emerges from the filtering processes the occur in the ears, body and mind. The question is how do our ears, bodies and mind affect how we hear and experience the world.

For Maturana and Varela (1998), the answer to this question is rooted in the biological history of humankind. The story of living beings is an ancient one, tracing back to the formation of the earth from stardust about five billion years ago. Approximately 3.4 billion years ago, molecular networks emerged, which could "produce themselves and specify their own limits" (p. 40). This capacity to self-produce yet maintain defined limitations is a fundamental feature in the organization of living beings. Living beings are characterized by their *autopoietic unity*. Autopoiesis, derived from the Greek auto meaning *self* and *poiesis* meaning *creation* or *production*, refers to the fundamental capacity of life for *replication*, which is a process of repeatedly generating "unities of the same class" (p. 59). A unity "involves making an act of distinction which distinguishes what has been indicated as separate from its background" (p. 40). As such, autopoietic unities are characterized by the ability to self-replicate as well as the presence of a boundary "that is essential for the operation of the network of transformation which produced it as a unity" (p. 46). This basic organization applies to all living beings from simple single-celled organisms to mammoth mammals like elephants and whales. Essential to the emergence of more complex, multicellular organisms is what Maturana and Varela (1998) call *structural coupling*: "We speak of structural coupling whenever there is a history of recurrent interactions leading to the structural congruence between two (or more) systems" (p. 75). First-order autopoietic unities in the form of simple, single-celled organisms give way to *second-order autopoietic systems,* which result from the recurrent interactions among the first-order systems. "All known multicellular living beings are elaborate variations of the same theme: cellular organization and the constitution of a phylogeny" (p. 81). Every evolutionary pathway leads to "variation results in different ways of being in the world, because it is the structure of the unity

that determines its interaction in the environment and the world it lives in" (p. 86). To put it another way, the history of life began with single cells drifting in the oceans and branched off to include fungi, plants, fish, reptiles and mammals. These divergent evolutionary pathways, which were shaped by interactions with the environment, determine how we are, know and act in the world. As a result, our experience of the world emerges from the interaction of internal structures rooted in our biological history with the external world. To illustrate this point, Maturana and Varela (1998) told a story about a laboratory frog, and one about girls who were raised by wolves.

> I. In a revealing experiment, a surgeon cuts the edge of an eye of a frog's larva and rotates it 180 degrees. The animal thus operated is left to complete its larval development and metamorphosis until it becomes an adult. Now we do our frog experiment. We cover its rotated eye and show it a worm. The tongue goes out, and we see that it makes a perfect hit. We repeat the experiment, but this time cover the normal eye. In this case we see that the frog shoots out its tongue with a deviation of exactly 180 degrees. That is, if the prey is below and in front of the animal, the frog will now shoot out its tongue backward and up. (p.125)
>
> II. In a dramatic case, two Hindu girls were rescued in 1922 from a family of wolves with which they lived in the north of India. They had been reared in complete isolation from all human contact….At the time they were found, the girls did not know how to walk on two feet. They moved about rapidly on all fours. Of course, they did not speak and had inexpressive faces. They wanted only raw meat and exhibited nocturnal habits. They rejected human contact and preferred the company of dogs or wolves….The one girl who survived after ten years…eventually changed her dieting habits and her cycles of activity. She learned to walk on two feet,

although she would go back to running on four feet under the stress of urgency. She never learned to speak properly, although she did use a few words. (p. 128, 129)

In the former case, the physical structures of the nervous system and eyes determined perception and behaviour. In the latter case, exposure to a particular environment irrevocably changed and moulded the organism. These examples challenge a solipsistic view of consciousness as an isolated mind by demonstrating that the nervous system is in constant interaction with its environment, which "continuously trigger in it structural changes" (p. 169). However, the influence of the environment on an organism is not absolute as the nervous system operates with structural determination. "Therefore, the structure of the environment cannot specify its changes, but can only trigger them" (p. 131). This suggests that there is a more complex interaction occurring between the world inside one's head and the world outside. We are not simply and objectively taking in data from sensory inputs, processing it, and producing outputs in the form of words or actions. Rather, our experiences emerge from an ongoing interaction between our nervous system and our surroundings. In Maturana and Varela's (1998) words, "the nervous system does not 'pick up information' from the environment, as we often hear. On the contrary, it brings forth a world by specifying what patterns of the environment are perturbations and what changes trigger them in the organism" (p. 169). In a sense, the structure, history and nervous system of an organism is constantly transforming and being transformed by its environments. The worlds inside and outside are deeply intertwined.

3.5 Third-Order Structure Couplings; Language, Culture, Art

On a primal level, our experiences in the world emerge from the interaction of an ancient nervous system that is rooted in a five-billion-year-old history with its surrounding. However, organisms do not live in isolation in their environment, but rather in constant exchange with other organisms. Living organisms enter the social sphere by entering into relationships with other

beings. Maturana and Varela (1998) designate the term *third-order structure couplings* to describe bonds that develop with "definite complexity and stability," whenever organisms take part in recurrent interactions (Maturana & Varela, 1998, p. 181). These social bonds are ubiquitous among life forms since they are essential for sexual reproduction. In social insects like ants, these couplings specify "behavioural coordinations that can last a lifetime" (p. 184). A solider ant is born to protect the colony, while the queen is born to produce eggs. On the other hand, larger animals can "participate in relations and activities that arise only as coordinations of behaviours between otherwise independent organisms" (p. 189). For instance, a wolf pack is able to synchronize its actions to kill a moose, which is a much larger animal. Social order, communication, imitation and learning are crucial components of third-order couplings that occur among wolves, dolphins, elephants, apes, chimpanzees and other mammals. However, the human propensity for language results in a kind of communication, behaviour and learning that is unique among living organisms. "The identity of human social systems depends on the conservation of adaptation of human beings not only as organisms but also as components of their linguistic domains" (Maturana & Varela, 1998, p. 198). Because human beings can abstract reality by using symbols, we can manipulate, replicate and communicate these symbols, gaining greater autonomy from innate structures and instinctive behaviours. For Maturana and Varela (1998), "consciousness and mind belong to the realm of social coupling. And as part of human social dynamics, mind and consciousness operate as selectors of the path which our ontogenic structural drift follows" (p. 234).

For philosopher and cognitive neuroscientist Merlin Donald (2001), an understanding of consciousness is also rooted in the symbolic domains of culture and language. Donald claims that "the human mind is unlike any other on this planet, not because of its biology, which is not qualitatively unique, but because of its ability to generate and assimilate culture;" thus, human

consciousness is "the hybrid product of biology and culture" (p. xiii). To illustrate this point, Donald distinguishes among three levels of awareness and their correlations in the anatomy of the brain. Within the brain's structures, there are primary, secondary and tertiary regions. The primary regions are connected to the peripheral nervous system and "receive signals from eye, ear and skin, via sensory pathways, and extract the basic features of sensation, such as colour, location, contrast, loudness, pitch and brightness" (Donald, 2001, p. 166). The secondary receive input from the primary areas, and also signal "back to the primary cortex, in very systematic patterns of reciprocal connections" (p. 166). The tertiary regions, on the other hand, have no direct "connections to either the peripheral nerves or the primary cortex"(p. 166).

> The tertiary regions are devoted to even more abstract cognitive processing than secondary areas and are truly a modal, or supramodal; that is, domain-general. They receive major inputs from all secondary sensory and motor regions and return those connections. They are thus perfectly located to influence and supervise cognitive processing and perform executive functions, such as working memory, selective attention, metacognition and planning. (p. 166)

The primary, secondary and tertiary regions of the brain can be found in diverse species to varying degrees. By comparing monkeys, apes and humans, for example, we can observe similarities in all three regions; however, the "tertiary areas became especially large in humans" (p. 165). Similarly, Donald identifies three levels of awareness that can be observed in diverse species to varying degrees. The first of these levels refers to the phenomenon of *binding*, which is the mechanism "ultimately responsible for our ability to perceive complex things, such as objects and events" (p. 179). The laboratory frog in the previous section provides an example of this mechanism with the act of distinguishing a moving object from the background, a fly, and shooting out its tongue to catch it. Ultimately, the binding problem deals with larger questions

such as how do "we extract such exquisite order from the seeming chaos of light rays scattered about the environment and the myriads of soundwaves accosting our ears" (p. 179). Level two awareness refers to short-term working memory, which allows an animal to hold a memory or idea in consciousness for some time, and develop a sense of the landscapes and longer perceptual sense of events. The third level of awareness, related to the tertiary regions of the brain, "is concerned with the intermediate- and longer-term regulation of thought and behaviour" (p. 196). This level of awareness builds on the previous two, but also encompasses "a vision of oneself, acting in a three-dimensional world" (p. 196). While level one and two awareness exist in many species, level-three awareness is "complete only in primates and fully developed only in humans" (p. 201). It is important to note, however, that this kind of awareness does not constitute consciousness. Without culture and language, various levels of awareness lead to what Donald (2001) calls episodic awareness.

> Lacking the normal human enculturation process, this brain system forms a kind of awareness I have called episodic. Episodic awareness is defined primarily by elaborate event representations. For an episodically competent mind, experience is not normally remembered as a confusion of objects, actions, colours, or raw sensations but as a series of events. These events are the given, the raw data, of its memory, which consists of experience that has been segmented into and remembered as a sequence of discrete episodes. All mammals do this to some extent. (p. 201)

Human beings, on the other hand, create powerful reservoirs of information in external symbolic systems that exist outside of the brain. These systems, in turn, shape and develop patterns within the nervous systems. Take for example, what you are doing right now to make sense of the words you are reading off the page or screen. In the Roman alphabet, there are twenty-three letters representing distinct sounds, which are combined to form words. However,

you are not thinking about individual sounds and assembling them into words. Rather, you are recognizing words and sentences from which emerge ideas and meaning. This ability of the brain to spontaneously detect words suggests that a lexicon has been stored in the memory as chunks of information. Without extensive education, this complex act of reading, which allows us to enter the inner world of an author, would be impossible. In this case, we can observe that enculturation alters the nervous system in profound ways. The human ability to code the inner world into a series of symbols, send and receive these symbols across space and time, and to store this information in libraries, archives and the Web fundamentally transforms human consciousness.

> Symbolic minds…are hybrid products of a brain-culture symbiosis. Expanded conscious capacity provides raw capacity, but it is unprogrammed capacity. Without culture, we could never have become full-fledged symbolizing organisms. We might have become something else, perhaps, with very powerful perceptual-motor systems, like those of a superprimate, but we would be only powerfully episodic, not symbolic. (p. 202)

Based on this understanding, it is possible to grasp the power that culture has on human consciousness. Because of our faculty to symbolize our reality, we can communicate, and just as importantly, reflect on our phenomenological world. This act of reflection, Maturana and Varela (1998) point out, is not merely a representation of facts and objects out there in the world, but rather a bringing forth of new phenomenological worlds. Furthermore, everything we do—reading, speaking, talking, hearing, listening, tasting, touching—is a world brought forth through the mechanisms of the nervous system augmented with the symbolic codes of culture interacting with its surroundings. In this sense, culture is an essential constituent of human experience, or as David Howes (2005) eloquently puts it, "biology provides the clay, but culture is the potter" (p. 5).

At this point we can return to the questions posed at the onset of this chapter: What is the nature of human consciousness, and how does it affect our experience of the auditory world? It should be evident that the answer is multilayered. Fundamentally, living beings are autopoietic unities, continuously bringing forth new worlds through interactions with their surroundings. Therefore, the act of hearing is deeply integrated with the entirety of a being's sensory and cognitive structures, and indeed, with the living being as a whole. Human beings, however, are products of enculturation, a process that "tunes our neurons" (Howes, 2005, p. 21). This suggests that our experience of the auditory world is affected also by how we were raised, the language we speak, the books we have read, the music we listen to and the movies we have watched. The symbiosis of biology and culture has deeply empowering implications for humans, because this gives us a degree of autonomy from innate structures and behaviours. That is, human consciousness can be transformed through reflection, discourse, education, knowledge and art. Thus, artistic works—by arranging, synthesizing and orchestrating sensory experiences—have power to bring forth new worlds.

> The knowledge of knowledge compels. It compels us to recognize that certainty is not a proof of truth. It compels us to realize that the world everyone sees is not *the* world but *a* world, which we bring forth with others. It compels us to see that the world will be different only if we live differently. It compels us because, when we know that we know, we cannot deny (to ourselves or to others) that we know. (Maturana & Varela, 1998, p. 245)

3.6 Conclusion

Up to this point, I have discussed my process of listening and recording, which have had a transformative effect on my conscious awareness of everyday surroundings. By editing the recorded sounds, I have also created artworks in the form of soundscape compositions. These

compositions exist as digital audio files of varying lengths. *The Morning Sun* (Figure 1) is one such composition, which combines sounds of geese, the surge of the Saint Lawrence River, and rumblings of a crowd. These compositions provide snippets of my experiences of living in Montreal. As an artistic endeavour, they have personal resonance and meaning; however, they remain open to the interpretation of the listeners who understand them through their experiences, and beings as a whole.

Figure 1: Akbari, E. (2012). *The Moring Sun*
This file can be accessed on Soundcloud.com:
https://soundcloud.com/ehsan-akbari-1-1/the-morning-sun

In the next chapter, I will discuss how my creative process of listening, recording, editing and presenting soundscape compositions can be applied to art classrooms for teenagers and young adults. To this end, Design-Based Research has been implemented because it is a pragmatic methodology for designing educational intervention in real-world settings. The focus of this research is twofold: to develop effective teaching tools and to gain theoretical insights into the shifts in consciousness that can occur by engaging in this process. As such, while the students were directed to create a final soundscape audio clip, the emphasis of the data collection and analysis has been placed on the learning that can occur during the creative process. I will present the findings of this analysis in chapter five.

Chapter 4: Methodology

4.1 Design-Based Research

To develop practical creative interventions for teaching soundscape compositions in the art classroom, the pragmatic approach of Design-Based Research has been adopted for this research. According to Wang and Hannafin (2005), Design-Based Research is "a systematic but flexible methodology aimed to improve educational practices through iterative analysis, design, development, and implementation, based on collaboration among researchers and practitioners in real-world settings, and leading to contextually-sensitive design principles and theories" (p. 6). That is, it aims to develop general design principles and theories that have educational benefits beyond the local context, while always taking into consideration the particularities of the context in which learning takes place (Brown, 1992; Collins, 1992; Barab & Squire, 2004; Castro, 2012; Design-Based Research Collective, 2003; Kelly, 2003; Wang & Hannafin, 2005). It is thus imperative that the resulting theory upholds a certain degree of flexibility in its design, and strikes a balance between refinement and adaptability (Barb & Squire, 2004). Design-Based Research differs from similar approaches such as action-research and formative assessment in that its central goal is the development of theories of learning, which can be applied beyond the local context (Brown, 1992; Barab & Squire, 2004; Wang & Hannafin, 2005).

Currently, Design-Based Research is being implemented by a number of researchers in a variety of educational fields, including Art Education. For instance, Mary Erickson (2005) has conducted a study in collaboration with seven practicing art teachers into how a Web-based learning environment "influences students' ability to transfer what they learn"(p.170). At first, traditional instructional programs were developed and implemented, followed by a revised Web version of the same unit. Over a three-year cycle, these programs have led to a hybrid online-offline art instruction that is engaging and meaningful for the students. Juan Carlos Castro (2012)

used Design-Based Research to investigate the impact of social media on learning, and the relationship of students and teachers in online environments. This study suggests that social media enables peer-to-peer learning, and shifts the role of the teachers. That is, social media distributes "the responsibility of what we have come to known as an art-teacher…throughout the collective" (p. 166). These studies indicate that a Design-Based Research methodology can be implemented to develop effective and practical teaching strategies, and to gain theoretical insights on teaching and learning in general.

The roots of Design-Based Research are often traced to the *design-experiments* of Ann Brown (1992) and Allan Collins (1992). As an educational psychologist, Brown identified the need for methodological changes in her field to reflect the theoretical shift from behaviourist learning theories to the cognitive revolution. The central tenet of this revolution is the "awakening to the fact that real-life learning inevitably takes place in a social context" (p. 144). Thus, the advancement of theories of learning will require interventions in the real world messiness of the classroom. It is for this reason that a central site of research for the first iteration of the research was the after-school workshops with high school students and their teacher. Engaging in the process of creating soundscapes in a real-world educational context makes it possible to test and refine the procedures of the workshops, as well as to identify the pedagogical, creative and theoretical value of this process.

The design experiments of Allan Collins (1992) aimed to study ways of integrating technology in classrooms, and to "construct a systematic science of how to design educational environments so that new technologies can be introduced successfully" (p. 15). Collins identified some major problems with the design experiments that were happening at that time. Firstly, people who had a vested interest in the success of a given technological design were often the ones conducting the experiments; and secondly, the designs were carried out without an

underlying theory rooted in education. Therefore, collaboration with teachers as co-investigators was a key component of Collins' design experiments. For this thesis, Anne Pilon's contribution during the first iteration was critical to the success of the workshops. Collaborating with art and music teachers from the Quebec Association of Independent Schools during the second phase of the research also provided invaluable insights on the effectiveness of the workshops. Additionally, Collins suggests that educational design interventions ought to be rooted in, and contribute to theories of learning. In this case, the creative and theoretical objective is to find innovative ways to use technology to raise conscious awareness of environmental sounds. As such, a theoretical understanding of conscious awareness and perception of sound has been instrumental in the design of the interventions. Moreover, this research aims to contribute to a theoretical understanding of how technology can be used to entice young people to become more aware of the world that is around them.

Considering the theoretical foundation of this research, it is important to highlight the nature of the data that was collected and the analysis that took place. Philosopher David Chalmers (2010) distinguishes between *the easy problem* and *the hard problem* of consciousness. He pointed out that, for instance, CT scanners have enabled neurologists to localize various cognitive processes in specific parts of the brain, and with the evolution of this technology, a detailed map of the brain may be possible in the coming decades. However, this understanding only addresses the *easy* problem, but does not tackle the *hard* problem, which is the problem of experience (Chalmers, 2010, p. 5). In other words, we currently have no clue as to how the various synapses in the brain lead to the cohesive, subjective experience of being conscious. While the scientific process may seem limited in addressing this question, exploring subjective experiences is a forte of artists. Yet, artists can only yield results of a phenomenological and subjective nature. This highlights that for the purposes of this project, the data collected and

means of evaluation need to be qualitative. This data includes journal entries describing the design and implementation phases, lesson plans for each workshop, personal reflections after each workshop, audio recordings of focus group discussions, and the recordings of soundwalks and edited soundscape compositions of participants. This data was coded and analysed in order to not only improve and develop the design of the workshops, but also identify the kinds of qualitative shifts that occurred in conscious awareness during the process of listening, recording and editing sound.

4.2 Limitations of Design-Based Research

Design-Based Research is a relatively new methodology, and there are a number of drawbacks that need to be considered in its implementation. One such concern is the absence of standards for identifying when the iterative cycles of collecting data should be stopped (Dede, 2004). Such studies can garner unmanageably large quantities of data in order to take into account the vast range of factors that can contribute to successful learning (Brown, 1992; Dede, 2004). Time and scale are important considerations at the onset in order to ensure that the scope of the design is manageable.

As such, it is imperative to start with a solid and specific theoretical foundation that will guide the analysis of data and refinement of design. As Cobb, diSessa and Schauble (2003) pointed out, "Design experiments are conducted to develop theories, not merely to empirically tune ‘what works’. These theories are relatively humble in that they target domain-specific learning processes" (2003, p. 9). Thus, the research question has to be kept in the forefront throughout the process of collecting and analysing data. While it is important to maintain an open attitude to serendipitous findings and transparency on successes and failures throughout the research process, it is also crucial to maintain *humble* and *specific* goals that hone and refine the theoretical concerns outlined in the research question.

A second challenge is developing design principles that can be applied beyond a specific local context. Particularly in the first iteration of the project, the workshops were conducted with a group of motivated students who volunteered out of interest. The advantage of this was outweighed by the difficulty of maintaining steady attendance due to the voluntary nature of these after-school workshops. This illustrates that teaching in different contexts can offer entirely unique sets of benefits and challenges. Design-Based Research provides some key strategies for overcoming these challenges, and aiding in the development of theory beyond the local context. One such strategy is the process of iteration, where a particular procedure may be taught to various groups of students in various situations. Through constant refinement of design, and by analysing data sets from various iterations, it was possible to develop robust and adaptable design principles and creative strategies for teaching sound in the art classroom (Collins, Joseph, & Bielaczyc, 2004).

4.3 First Iteration—All-Girls High School

The first site of research for this thesis was an all-girls high school, which is a private high school in Montreal, Quebec. This school places a strong emphasis on academic success, as well as participation in the arts and a wide variety of extra-curricular activities. As such, many of the students tend to be academically focused and very busy. The decision to conduct research at this location was largely due to my acquaintance with Anne Pilon, who is a veteran art teacher at the school as well as an artist interested in working with sound. My collaboration with Anne gave me access to the site, but importantly also meant that I had a reliable partner who could offer salient insights throughout the process. We agreed to hold four one-hour workshops in her classroom after school. Anne placed calls for participants in the schools' morning announcements and approached some of her students who would be interested in working on a

sound project. She was able to recruit eight students in total, although the number of participants fluctuated from workshop to workshop.

Prior to starting this first iteration, I had conducted a pilot study with four colleagues in the Art Education department, who have classroom and community art teaching experience. During the two pilot workshops, I was able to test my interview questions and lesson plan, which enabled me to develop a detailed action plan. This plan includes an outline of the procedures, equipment, example artists and interview questions that were to be used (Table 1). While conducting the workshops, this action plan was adapted to fit the specific demands of the context. Numerous amendments were made based on the constraints of time, responses of the participants and feedback from the coordinating teacher, Anne Pilon.

Table 1: First Iteration Workshop Design

Procedures	<u>Workshop 1</u> 1. Start with a focus group discussion of listening and sounds. 2. Listening exercises: Listen carefully to the sounds in the room. 3. Recording: Listen to the room through headphones and a digital microphone. Find interesting sounds and record. <u>Workshop 2</u> 1. Editing: Introduce GarageBand and practice by using the recordings from the first workshop to edit a collective piece. 2. Listening: Examples of Sound Art (Janet Cardiff, Murray Schafer, Hildegard Westerkamp, Alvin Lucier). Homework: Record sounds in and around the school. Bring sounds to next workshop.

	Workshop 3 1. Listening: Listen to the homework recordings by playing a game of "guess that sound." 2. Present the theme of illusion in visual art (Victor Vasarely, M.C. Escher, Salvador Dali) and sound (Steve Reich, Diana Deutsch). 3. Discuss editing strategies. Homework: Individually edit the audio recordings to make a sound piece. Workshop 4 1. Presentation of "Soundscapes." Critique. 2. Final Focus Group Discussion. (See final questions).
Equipment	1. From Hexagram: Digital Audio Recorders, Sennheiser shotgun microphone. 2. Provided by participants: iPhones, iPads, Blackberries, smartphones, laptops.
Software	Audacity (PC), GarageBand (MAC).
Example Artists	See: Victor Vasarely, M.C. Escher, Salvador Dali. Hear: Steve Reich, Diana Deutsch, Murray Schafer, Hildegard Westerkamp, Janet Cardiff, Alvin Lucier.
Elicitation questions	Sample questions What are some sounds you enjoy? What are sounds you dislike? What sounds do you hear in this room?

Baseline questions	Sample questions How can you use sound artistically? In what way is sound similar to and different from other media (drawing, paintings, sculpture, etcetera)? Can you think of artworks that incorporate sound in a significant way?
Final questions	Sample questions What have you learned? What aspect of the workshops did you like most? How could you present this sound piece effectively? In what way is sound similar to and different from other media (drawings, paintings, sculptures, etcetera)? How can you incorporate your soundscape composition with other visual media? How could you present this sound piece effectively? How could you use sound artistically in the future?

4.3.1 Workshop 1

Four participants attended the first workshop, which was composed of two activities: a focus group discussion and a soundwalk. During the discussion, I asked the participants about the sounds they enjoyed and disliked, the relation of sound to visual arts, and the potential of using sound creatively. Most importantly, I asked them to identify the sounds in the room before and after actively listening to it in silence. Our conversation about sound and listening was followed by a soundwalk, during which the participants walked around the hallways listening, and took turns using a Sennhieser shotgun microphone to record sounds. The recording of the soundwalk

not only documented the kinds of spaces and sounds they were interested in recording, but also contained their reactions to these sounds. For this reason, this recording and the transcription of the focus group discussion were the primary sources of data collected from this workshop.

4.3.2 Workshop 2

Eight participants attended the second workshop. Based on Anne's suggestion after the first workshop, I had made some alterations to my approach. Anne had told me that some of the participants were putting together portfolios for art colleges, so I decided to start by introducing myself as an artist and showing examples of work in a variety of visual media. I also showed the work of Janet Cardiff, Andra McCartney and Hildegard Westerkamp as examples of sound art and soundscapes, and gave clear guidelines of what they were to be making: a two-minute edited recording of the sounds in their school. After this presentation, I gave the participants the sound recording devices: two portable Edirol R9 audio recorders, and one Sennhieser shotgun microphone, to go on a walk and record. I followed them for the first part of their soundwalk as they walked down a hallway full of private music rooms with pianos, arrived into a larger room with a piano and drums, exited the room and went into the library. I observed them engage with different spaces in their school as if the school was a musical instrument. I left the library, but the students continued on their soundwalk, recording other spaces. The recording of this soundwalk was the primary data collected during this workshop.

4.3.3 Workshop 3

Only two people showed up to this workshop. There were some difficulties in scheduling this workshop, as the participants and teacher were busy. Because of scheduling conflicts, the third workshop was held on a Wednesday, in contrast to the previous ones held on Thursdays, so some participants had other academic obligations. The focus of this workshop was on the basics of audio editing. Due to students' access to personal computers, *Audacity* was chosen as the

editing software. The basics were covered: importing a track; cutting, copying and splitting tracks; adding other tracks; and mixing layers of sounds together. The participants took turns editing, using mostly the cut, paste and the speed effects to create a composition. This composition was the data collected from this workshop.

4.3.4 Workshop 4

This workshop took place in January with one attendee, a couple of months after the previous meetings. The primary aim of this workshop was to discuss and apply a creative and theoretical approach of editing sound that aims to make familiar sounds strange. We started by looking at M.C. Escher's *Night and Day*, which uses specific visual techniques that render an ordinary scene strange, and identifying formal elements in the images that could be translated into sound. Vincent Van Gogh's painting *Farm View* was also shown for its use of colour to render three-dimensional space. After that, time was given to apply these ideas to editing a soundscape. The session concluded with an interview about how the participant would use soundscapes in the future, and what she enjoyed about the learning process of making a soundscape. The data collected from this workshop includes notes taken during our discussion on the formal qualities of the visual arts examples and their parallels in sound; an edited soundscape audio file; and the transcription of the final discussion.

4.3.5 Reflections on the First Iteration

Upon the completion of the final workshop, all of the collected data was analysed in order to identify the pertinent aspects of the design and implementation of the first iteration so as to make improvements for future iterations. The biggest question to be answered about the first phase was, why had there been a drop in the number of attendees after the second workshop? One answer lies in the context of a private high school, which places a strong emphasis on academic achievement and social activities. The result of this is that students have to prioritize and choose

among a number of different extracurricular activities such as math tutoring, volleyball tournaments or voluntary workshops on soundscapes. The factors underlying choices in extracurricular activities during adolescence and middle childhood are explored by Jacobs, Vernon and Eccles (2005), who identify "task value" as a key motivator. They distinguish between "attainment value" and "intrinsic value." The former refers to "the personal significance of doing well on a task" because it affirms one's goals and identity, while the latter is concerned with the enjoyment derived from engaging in the activity (p. 237). While both factors are powerful motivators, staying engaged in a particular activity over time largely hinges on "utility value" or perceived usefulness for one's goals (p. 238). For voluntary art workshops that have little bearing on academic achievement, the intrinsic value of the activity is the key incentive for participating, but the utility value of the activity is essential for continued engagement over time. In the case of Lucy, the one participant who eagerly attended all four workshops, both the intrinsic and utility values were at play. For instance, during both the initial and final discussions, she expressed a deep interest in the connection of visual arts and music by talking in depth about how the sounds of various musical instruments could be represented visually. She also had specific plans to use sound recording and editing for a future English project to make a "book trailer." The lesson drawn from this experience is that effective teaching requires one to consider both the intrinsic value derived from the process of creating soundscapes, and the applicability of this work for future goals. Integrating sound with other aspects of the curriculum can be a motivator for long-term engagement. However, this was a limitation for this thesis, which depended on voluntary participation over a two-month period.

In order to address the issues raised during the first iteration, a number of modifications were made to the design of the workshops. Upon reflection on data in phase one, it was decided that doing a single-session workshop would best suit the circumstances surrounding the research.

To facilitate this, mobile devices such as an iPad or smartphone could be implemented to make soundscapes. These devices have the advantage of having both recording and editing functions, which makes the overall process faster and more efficient. The trade-off is that even a fairly versatile audio editing application like GarageBand does not offer as much precision control as desktop computers. In spite of this, the portability of mobile devices means that participants can go on soundwalks and come back with sounds they can instantly play back. Additionally, a single-session workshop would allow for a continued emphasis on the two elements of the design that proved successful in the first iteration: listening exercises and soundwalks. Both these exercises yielded pertinent data related to the thesis question and objective, and as such continued to play an important role in the second iterations.

4.4 Second Iteration—QAIS at Concordia University

For the second iteration, I had the opportunity to work with the art representative at QAIS—Quebec Association of Independent Schools. QAIS is an organization consisting of English elementary and secondary independent schools, whose main aim is to promote "innovation, collaboration and educational excellence" (Quebec Association of Independent Schools, 2014). Art, drama and music teachers from QAIS hold regular meetings focusing on professional development, and the soundscape workshop seemed fitting for their mandate of fostering collaboration among visual arts, music and drama teachers. A letter was sent out from the art and music representatives of QAIS to invite teachers to participate in the workshop, which was to be held in the Art Education undergraduate studio at Concordia University.

Conducting the second iteration of this research with art and music teachers has the drawback of not directly engaging high school students in the in-situ context of an art classroom. However, working with experienced teachers from different creative disciplines can allow for in-depth discussions of the pedagogical potential of various aspects of the workshop, provide a

venue for brainstorming approaches that could invigorate teaching in the arts and music, and offer possibilities for collaboration among these disciplines. As such, the thesis objective and questions could thoroughly be explored during this phase of the research. Taking into consideration the preliminary findings from the first iteration and the particular considerations of the new research site, a new design for the workshop was developed (Table 2).

Table 2: Second Iteration Workshop Design

Procedures	Workshop 1 1. Start with a presentation of myself as a visual artist interested in working with sound. 2. Do Listening exercises: Ask "what are the sounds in the room?" Listen carefully to the room. Ask the same question again. 3. Present and discuss pertinent examples of artists: Janet Cardiff, Brian Eno, John cage and Murray Schafer. 4. Present strategies for teaching the process of listening, recording and editing. 5. Soundwalk: Using GarageBand on the iPad, participants walk around the campus to record key sounds. 6. Brainstorm how the process can be applied in the classroom; feedback about the workshop.
Equipment	Apple iPad tablet.
Software	GarageBand (iPad).

Example Artists	Janet Cardiff, Brian Eno, John Cage, Murray Schafer.
Final questions	Sample questions What aspect of the workshops can work in the classroom? How can the ideas from this workshop be incorporated into your teaching? How can a soundscape be presented effectively? How can music and visual arts teachers collaborate using sound?

Three participants attended the workshop, two of whom are music teachers and one an art teacher. During the course of the presentation, numerous insightful conversations occurred. Most notably, after the one-minute deep listening exercise an extensive discussion took place about silence and significance of sound in daily life. At the end of the presentation and soundwalk, the teachers also discussed how the process of listening, recording and editing sound could be applied in their art and music classrooms. They shared experiences of working with sound, and walked away with concrete ideas and plans for implementing this process in their classrooms. The findings of this will be discussed in the next chapter. The discussions throughout the workshop have been recorded and transcribed as the primary source of data for this iteration.

4.5 Data Analysis

> Wang and Hannafin (2005) distinguished between two levels of data analysis:
>
> Level I Data describe the exact research setting and the research processes, such as notes from observations in classrooms, and specific revisions made in the design;
>
> Level II Data represent a distillation of Level I Data and are used to explain the design and to construct design principles. (p. 18)

During the first iteration, the Level I Data that was collected included lesson plans, journal entries of reflections after each workshop, and audio recordings of group discussions and soundwalks. This data was analysed in order to improve the design of the workshops for the second iteration. This analysis largely focused on practical, procedural and technical issues; namely, identifying what worked, problems that were encountered, and the aspects of the design that needed improvement. Numerous refinements were made to procedures and technological tools (compare Table 1 and 2). For instance, the four session workshops became a single session workshop, and mobile devices were to be used to facilitate the process.

Upon completion of the second iteration, data from both iterations was re-examined more deeply. The Level II data included all journal entries, transcripts of discussions, audio recordings of soundwalks, edited audio files of soundscapes, as well as the analysed Level I data. At this stage, the research question was the focal point for coding the data.

Question: For students participating in these workshops, what are the *salient creative features* of the process of *listening, recording and editing* sound to explore *conscious awareness* of *ambient sounds*?

The Level II data was coded using these keywords extracted from the question: listening, recording, editing, conscious awareness, ambient sounds, and salient creative features. The focus of the analysis was to identify effective procedural aspects of the design, and to highlight the theoretical insights gained from the experience of creating a soundscape. The former deals with questions such as which example artists and artworks were most inspiring, and what kind of procedures stimulated thought, awareness and creativity. The latter focuses on the ideas that were generated during the workshops about conscious awareness of ambient sounds. As an additional step toward rigor, a peer independently coded a representative sample of the data using the same set of keywords. This sample included excerpts from the initial focus group discussion and the

final conversation of the workshops at the high school, and a section of the discussion with QAIS teachers. The coded data was compared with my coding in order to confirm the plausibility of my findings.

By conducting two iterative cycles of workshops, and by comparing data from these cycles, it has been possible to not only develop specific and adaptive strategies for teaching sound in the art classroom, but also gain valuable theoretical insights into how the process of creating soundscapes can enrich conscious awareness of the sounds around us. The results of the analysis will be discussed in the next chapter.

Chapter 5: Findings

5.1 Introduction

In this chapter, I will present the key findings, drawn for the analysis of data from all workshops, in two sections: curricular design and theoretical insights. In the former, I will address the questions of what the salient creative features of the process of listening, recording and editing sound are, as well as suggest methods for applying this process in the classroom. In the latter, I will discuss the nature of the conscious shift that occurred as a consequence of using the ear and technology to listen to our surroundings, and what this tells us about the impact of using recording devices on our conscious awareness. The chapter will conclude by highlighting the pertinence of these theoretical insights for using technology in the classroom.

5.2 Curricular Design

Since its inception, the curricular design of the workshops have been rooted in the reciprocal process of listening to everyday sounds, and recording and editing them to create works of art. By doing two iterations, firstly, with a group of high school students and later, with art and music educators, it has been possible to test each stage of the procedures in real-world contexts at least once, and extrapolate important lessons about what one learns and how one can teach this process in the classroom. It is important to note that there were some variations in design and implementation during each iteration, which resulted in the collection of different kinds of data. The most consistent aspect of the workshops was the listening exercise, which resulted in similar findings in both iterations. Additionally, significant improvements were made with the introduction of new terminology during the second iteration. The editing stage, on the other hand, was thoroughly explored during the first iteration, while more in-depth discussions about presenting a final project occurred in the second iteration. The implementation and analysis of both workshops have contributed enormously to a deeper understanding of the application and

educative value of deep listening, silence, recording exercises, the editing process and the presentation of sound as art.

5.2.1 Listening

One of the crucial components of soundscape workshops is the act of deep listening. A key exercise that launched both workshops was asking participants to identify the sounds in the room they were in. A consistent result of this exercise was that while the listeners were able to identify all predominant sounds at first, after a minute of silence more nuanced and subtle qualities of sound were identified. During the first iteration at the high school, this transformation could clearly be observed. Please note pseudonyms have been used for the participants.

What are the sounds in this room?

Before listening exercise	After listening exercise
Sara: The tap. *Lucy*: Chairs being stacked. *Mary*: Unfolding newspapers. *Sara*: Chalkboard. *Lucy*: Backpacks being opened. *Mary:* Right now, I'm hearing the generator. *Lucy*: Paper towel being pulled out of the dispenser. *Neda*: **These all sound like actions right now.**	*Lucy*: **You hear it more in the winter**. When they turn on the heat, which makes it louder during the winter months. *Mary*: There's the clock and the hum of, some kind of generator, a radiator. There some kind of hum that's always there. *Sara:* I heard the headphones over there make a clicking sound. *Neda:* There are echoes throughout the halls.

As Neda astutely pointed out, all the sounds they picked out at first were actions. When asked about the sounds of their art classroom, the young pupils started thinking about what usually happens in the room. After a minute of listening in silence, however, they became aware of background sounds such as the clock, generator, and "echoes in the halls", or fainter sounds like the "clicking sound" of headphones. Lucy's comment about the winter months is interesting as she touches on a key feature of any soundscape: its circadian and seasonal patterns. Likewise, when the question was posed to the QAIS teachers, it produced much more detailed and sophisticated answers after the one-minute listening exercise. Pseudonyms are used here.

What are the sounds in this room?

Before listening exercise	After listening exercise
Dan: Air flowing through the vents. *Nick*: Voices are the main things we're focused on, then you have the background like Dan was saying, the air sound, and the humming of the speakers or whatever that is. Little things moving around. That kind of stuff.	*Dan*: There is the odd sporadic sound of other things happening in other rooms, above us and beside. Shoving of the tables. *Nick*: I am trying to figure out, it seems like there's two vent sounds. *Ana*: I did get some of this faded kind of a background that I didn't hear before from outside the window. *Dan*: Low frequency, very low amplitude hum from the cars. *Ana*: Yah, couldn't hear that before. *Dan*: Sometimes it's hard to decipher exactly what you're hearing. Whether it's

	like a high-pitch electronic digital buzz, or it's my own mild tinnitus. *Ana*: I have it in my left ear. My left ear is thumping.

At first, the teachers concisely and accurately depicted the soundscape of the undergraduate studio at that particular moment in time. After a minute, the descriptions became richer, and new sounds from outside of the window became distinguishable. For example, the sound of traffic outside was heard and described as a "low frequency, very low amplitude hum." Dan's comment about a "mild tinnitus" touches on an intriguing aspect of the experience of sounds and sensations in general; that is, the experience of any sound is ultimately an internal cognitive process, and therefore, our inner awareness affects the experience of the outer world. The experience of any soundscape is always coloured by the instruments we use to hear: our ears, which are an integral part of our conscious being as a whole.

In both iterations, the act of listening silently for a minute led to more acute awareness of the soundscape of the room. As such, sitting silently and actively listening to the room is a good starting point for teaching soundscape compositions. This act of deep listening can then be taken outside of the classroom or school to explore different spaces with interesting sounds. Listening is a key component of teaching and creating soundscapes. The integration of deep listening into daily life has been one of the more gratifying aspects of doing this research. After spending a period of time listening to quotidian environments, and recording and editing their sounds, my awareness of the soundscapes in these environments has also increased.

5.2.2 Silence

Doing the listening exercise with the QAIS teachers instigated a detailed theoretical discussion about silence. One of the participants alluded to a well-known anecdote of John Cage stepping into an anechoic chamber. In Cage's (1961) words,

> For certain engineering purposes, it is desirable to have as silent a situation as possible. Such a room is called an anechoic chamber, its six walls made of special material, a room without echoes. I entered one at Harvard University several years ago and heard two sounds, one high and one low. When I described them to the engineer in charge, he informed me that the high one was my nervous system in operation, the low one my blood circulation. Until I die there will be sounds. (p. 8)

For Cage, this experience had been revelatory: there is no such thing as absolute silence for living beings, and as such, sound establishes a deep connection to life and one's being in the world. So it is that Cage began using silence as a fundamental element of composition, opening the doors of music to let in the wider living world and its sounds.

However, as the teachers pointed out, absolute silence can be quite discomforting, as it is a completely alien experience for living beings, signifying the annihilation of life. Yet, relative silence, or the kind of silence that is decorated with subtle ambient aural waves flowing through ether, can also be unsettling. This is illustrated by an anecdote from Nick:

> I remember with my daughter, around the time she was a year old, I would find myself wake up in the middle of the night once in a while and think 'oh my god, there's no sound, She's dead.' So the effect of that silence is that there was a few times where I thought I was going to have a heart attack waking up in the middle of the morning to silence. And not really silence, but just a regular morning. So, it's all about perception. Suddenly you are more in tuned to the noise of your kid.

In addition to vividly describing the disconcerting feeling we can experience from silence, this story shows how sound connects us to others. The need to make utterances and to hear the utterances of others binds families, communities and people. As such, sound and silence are also important social phenomena.

This lack of comfort with silence was also an undercurrent of the experience at the high school. When asked if they had previously noticed the sounds they had identified after the listening exercise, one participant's response was "I've noticed them before because there seems to be a lot of awkward silences." Awkward silences can arise in social situations were participating members do not feel entirely comfortable with one another. Certainly in the context of a classroom, such silences are important. As a teacher, I often fear the awkward moments when my questions and statements are met with dead silence from students. One is inclined to confuse these silences as a lack of intelligence, or apathy and docility, and one's instinct in such circumstances is to try to fill in and clutter the silence by talking over it. While this aversion to silence is perfectly understandable, I would argue that inserting silence in one's teaching could be deeply enriching. The aim of the listening exercise has been to illustrate that when one sits in silence and listens, one is bound to become more aware and attuned to the ambience of a particular space. In this light, silence is an opening toward a deeper engagement with the spaces of classrooms. This eloquence of silence is expressively summed up by a personal story told by one of the participating QAIS teachers, Dan.

> I grew up in Northern Ontario, and being in the woods at night in the dead winter, I've found has been the quietest time of my life. Just this past winter, I went back and found myself in the woods. As I was walking, I realized what was happening, and I stopped the crunching of the snow under my boots, and just stopped and listened for a while, and it was so quiet it was almost a shock. *The silence was so*

loud. It seemed like the end of something. Ah! All that sound that has been happening for the last year, since I got back to this silence again, so let's enjoy it, and let it last. It doesn't last very long.

5.2.3 Recording

During the first iteration of the workshops, participants had the opportunity to record the sounds of their high school during the first and second workshops. In the second workshop, I gave them two portable audio recorders, and a shotgun microphone to share, and asked them to explore the soundscape of their school. By following them for the first part of their soundwalk, I was able to watch them in the process of recording. This is what I observed:

> They first walked down a hallway with lots of private music rooms with pianos, and arrived into a larger room with a piano and drums. One person started to play the piano as others walked around the room. Another person recorded sounds of the blackboard being cleaned, and another pointed the recorder out the window. Next, the group went into the library. They started walking between the shelves, picking up books and flipping through them to record their sound.

It was fascinating to see them walking around their school manipulating objects to draw sound out of them. It is also important to note their choice of locations to record: music rooms, the library, and later, the gymnasium and washrooms. This would indicate that these spaces contain the sounds that participants found most interesting. One could also deduce that these spaces are significant sites in the students' daily experience of school.

However, while the students' exploration was interesting, it lacked the conceptual coherence that could guide the recording process. That is, simply asking them to find *interesting* sounds in their school was not enough. Consequently, in the re-design of the workshop for the second iteration, new terminology was introduced to better direct the recording process. This

lexicon, taken from Murray Schafer (1977), identifies the *signal, keynotes* and *soundmarks* as key components of a soundscape. Just as an image has a background, against which figures in the foreground are discernable, there are keynotes and signals. Keynotes are "the anchor or fundamental tone" of a place (p. 9). They are the background sounds that are always present but are listened to mainly unconsciously. The sounds of a nearby sea, or traffic in cities are examples of this. Signals, on the other hand, are "foreground sounds that are listened to consciously" (p. 10). Bells, horns, sirens and people's voices are common signals. One can aim to identify and record both keynotes and signals in a given space. In order to identify the unique characteristic of an environment, one can also listen for soundmarks. Soundmark is "derived from landmark and refers to a community sound which is unique and important to the community" (p. 10), such as the church bells in Montreal or the calls to pray in Istanbul. A stimulating question to ask students is "what are the soundmarks of your school?" That is, what are the sounds that identify and bring you together as a community? An advantage of asking students to listen for and record soundmarks is that one could make a more direct correlation between the recordings and the spaces students consider significant in their daily experiences at school.

During the second iteration, this terminology was presented to the QAIS teachers to introduce the recording process. The word soundmark was immediately met with great enthusiasm; particularly, for its equivalence to landmarks in the visual world. When asked about the soundmarks of their schools, Ana pointed out that the loud noises of students filling up the hallway between periods function as a clock as "it establishes everyone's life; it really creates the order, and we all abide by it." As a result, once the teachers were given iPads and asked to walk around Concordia's campus, this term was conducive in guiding their exploration. Upon returning and reporting their journey, they referred back to this word. Dan said, "I recorded the elevator. I thought that was a really important soundmark. It would tell you where you are in the

building if you heard the elevator." Nick also commented, "if you're walking down a quiet hallway, and you start hearing people talking, you can tell you're getting to the end of a hallway, as a soundmark."

Later in the discussion, the teachers returned to the notion of soundmarks as a means of conceptualizing a soundscape composition project that they could do with their students. One of the ideas that emerged from the discussion was doing a *sonic portrait* of the school. Ana explained:

> I would usually give them cameras and ask them to record certain parts of the school, and put it all together as a composite of what the school portrait is. But imagine if you were to give them the iPads, and ask them to walk around the school, and do a sound representation of what the school is. A portrait using sound.

In this kind of project, the soundmark can give students a clear directive while they are walking around the school documenting sounds. For Ana, composing a sonic portrait of the school with her students has significance: "We spend seven hours a day there. It becomes our world, for the children especially, so it would be nice to have them interpret it."

5.2.4 Editing

Once a variety of sounds are collected, they can be mixed, edited and transformed. There are a number of pertinent creative and aesthetic considerations in composing a soundscape, particularly in regards to the theoretical framework of consciousness. In my creative work, I aim to use editing to bring attention to keynotes, which are the sounds that define a sonic space but are largely experienced unconsciously. I do this by making the familiar strange through the use of repetition, looping and various effects so as to bring attention to the sounds we typically tune out. In order to elucidate this for students in visual arts classrooms, I find it useful to look at two visual arts examples and relate them to sound.

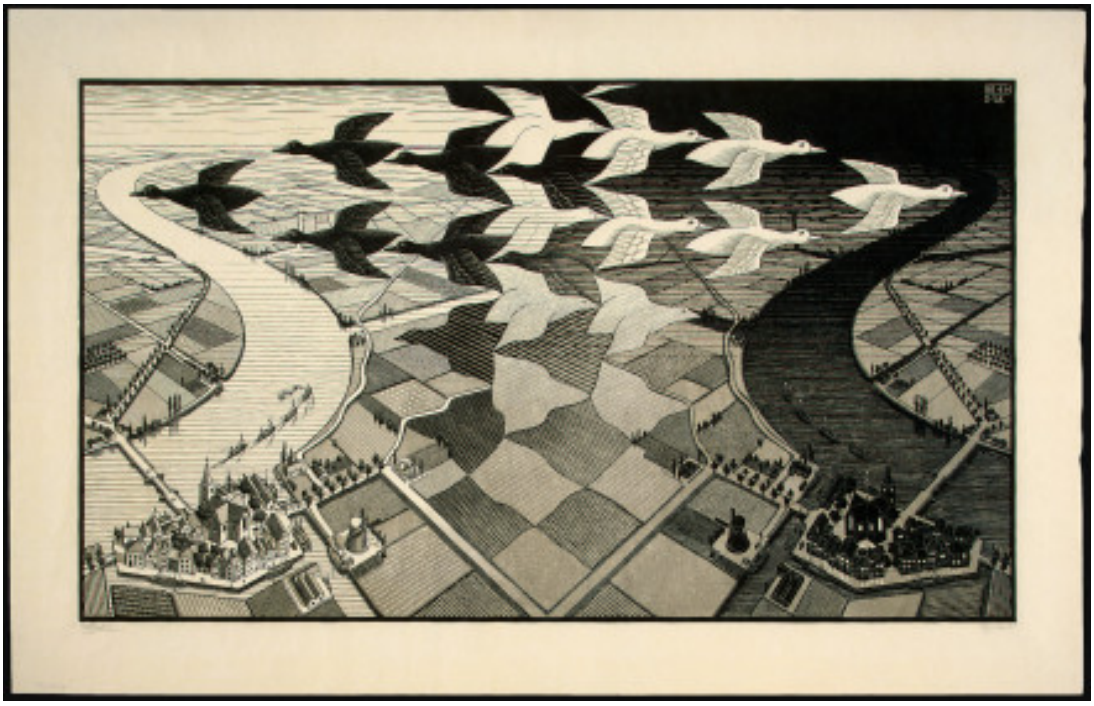

Figure 2: Escher, M.C. (1938). ***Night and Day***
This image was used as a visual example to inspire an approach to editing that turns ordinary sounds into a novel composition.

The first image is M.C. Escher's *Night and Day,* chosen specifically because it makes the familiar strange by transforming an ordinary scene of geese flying over a village into a visual illusion. Escher uses contrast, symmetry and repetition to bring the viewers' attention to the act of seeing. The question that concerns us is how these elements can be applied to editing sound so as to bring the listeners' attention to the act of hearing. To gain some perspective on this, we can study this image, identify its formal elements, and translate these elements to sound. For example, symmetry and repetition can be achieved by cutting, slicing, looping, and rearranging sections of the sound recording; contrast can be created by combining sharp and soft sounds; and a sense of depth can be conveyed by effectively arranging loud and quiet sounds and using the panning tool to move the position of a sound source in the left and right speakers. This image was presented during the first phase at the final workshop with Lucy. I asked her to think about how Escher composes his images, and how these elements could be used when composing a

soundscape. Lucy's comparisons frequently suggest a musical approach to editing by taking into consideration factors like tempo and beat. In the edited composition that she produced, repetitive sounds of chalk writing on a blackboard and piano are looped to create a steady rhythm and tempo. Foreground sounds of the gymnasium and people are faded into the soundtrack, creating a sense of movement through space.

Lucy's analysis

How does Escher create the illusion?	How can you translate this to sound?
Repetition	→ Tempo / Beat
Contrast	→ Clash of two genres of music
Sense of Depth	→ Loud and soft sounds

The second image is Vincent Van Gogh's *Farm View*, which uses colours effectively to create a sense of depth in space. In this image, we can think about how cool colours occupy the background, while warm and vivid colours are in the foreground. Translating this into sound, we can think about the higher pitched sounds, which are generally more noticeable and directional, as warm colours, and the low-pitched sounds, which are generally less directional and occupy the background, as cool colours. When composing a soundscape it is important to think about how to arrange the high, mid, and low sounds to give a sense of depth and richness. This consideration for the various frequency ranges can also lead to alternative approaches to editing. In the QAIS workshop, Dan pitched the idea of bringing a range of high, mid and low frequency recordings to the students and asking them to create a composition by combing sounds from the different frequencies. While all students start with the same palette, the ultimate result is bound to be diverse, demonstrating how blending these building blocks can itself be a fertile creative exercise. In any approach to editing, however, paying attention to the spectrum of sounds and composing

them methodically is key. Just as a painter aims to strike a balance between the reds, blues and yellows, so too must a soundscape composer think about the low, mid and high sounds.

5.2.5 Presenting

The presentation of a soundscape provides endless creative possibilities for the art classroom as sound can be presented on its own, or integrated with various visual media in interesting ways. One option is to present the soundscape on its own as an audio file, or to share it through an audio sharing website like *Soundcloud*. Soundscapes can also be combined with an array of visual media, such as installation and video. Video is a particularly suitable medium as it combines sound, images and text to invoke an artistic expression. In my artistic practice, video art has given me the platform to amalgamate the distinct acts of writing poems, taking pictures, and making soundscapes. I have composed series of multimodal poems, for example, in which the harmony and dissonance of sounds, words and images give rise to poetic sensations. Creating videos that separate and combine different elements can be an effective means of raising students' awareness of the multimodal nature of digital media, as it provides an opportunity to reflect on how meaning can be conveyed and altered with the combination of sound, text and image. A classroom project can begin with a soundscape to which images are added, or a video clip for which a soundscape is composed.

The connection between videos and soundscapes is also an evident theme in the data from both sites. During the initial focus group discussion at the high school, students were asked to find correlations between sound and visual arts. This provoked one participant, Neda, to draw a link between high-pitched sounds and images of birds and bees jumping around in a movie, which she thought was "cool because without the image you can still imagine the scene." In the final meeting at the high school, Lucy and I had a discussion about how she might use what she had learned in the future. Her idea was to make a "book trailer" by recording and editing sound

effects for her English class. This short movie would illustrate the plot of a book by using words, images and sound, which indicated that there was already a tacit understanding of the multimodality of the medium of video among students. Developing projects that raise awareness of this implicit knowledge can be a source of creative inspiration. During the Concordia workshops, the QAIS teachers were also asked how soundscape could be implemented in their classrooms. This question reminded Nick of a project he had done with a music class:

> I gave each student a different video and said, 'Okay, you have to compose the music for it.' So you'd see things like cats stuck in a fan, and the students have to think about what kind of music they would compose for that.

Nick observed that while some students started with the image and thought about how to create music for it, others began sampling everyday sounds to illustrate the scene. These examples suggest that video can be studied as a medium that is inherently multimodal. Students stand to benefit from a deeper understanding of how sound, image and text are combined with digital media by doing projects that require them to think about separating and assembling these elements in creative ways.

Another approach to presenting soundscapes is installation. The artistic practices of John Cage, Brian Eno and Janet Cardiff highlight the profound relationship that exists between sound and space. In Cardiff's *Forty Party Motet*, for example, the sculptural arrangement of the speakers defines the space in which listeners move to interact with the music, and the movement of the spectator through space is the key compositional element. This approach to presenting the soundscape was favoured by Ana, who suggested asking students to gather in the classroom after finishing the recording process, and playing their soundscapes simultaneously within the space of the classroom. She explained:

> I'm thinking, for example, Dan plays his sound, and then Nick comes in later and plays his sounds, and the next we know, we have all this layering and orchestration happening. I can see that being useful in an art class where all of a sudden you've got all these different levels, different sounds coming at you.

Thinking about sonic composition as the layering sounds in space creates a bridge between the soundscape and elements of form and space in the visual arts. The composition of space is also a central concern for contemporary installation artists, some of who consider sound to be a crucial element of their work. In the art classroom, this relationship between sound and space could be explored in installations that start as soundscapes and cumulate into projects that can incorporate paintings, photographs, dance, movement and performance.

5.2.6 Summary

A careful analysis of the data indicates there are a number of salient features in the creative process of listening, recording, editing and presenting soundscapes for the art classroom. These findings are a vital step toward establishing a set of curricular procedures that can be utilized in a variety of educational contexts to raise students' awareness of environmental sounds and to invigorate their creative practice by introducing them to soundscapes. A summary of how to teach this process can be found in *Appendix 1*. It is imperative to mention that this is not meant as a prescriptive formula, but rather a set of robust and adaptable procedures that can be put into practice in a variety of educational contexts.

5.3 Theoretical Findings

The central theoretical questions this research hopes to shed light on are: Does this creative process lead to a shift in conscious awareness? What is the nature of this shift? And what is its pertinence for education in general, and Art Education specifically? The data from the listening exercise confirms that conscious awareness of ambient sound does expand when we

remain still and simply listen. This is significant for understanding consciousness because it reveals the directed nature of our awareness. When we are asked to direct attention to the sounds in the environment, new sounds emerge from the background that had previously been experienced unconsciously. The sound waves had already been floating in space, but became identifiable only once we tried to identify them. This observation seems consistent with Maturana and Varela's (1998) thesis that "cognition is an ongoing bringing forth of a world through the process of living itself," suggesting our understanding is the result of a simultaneous convergence of inner and outer worlds. In this case, when we steer the attention of our inner world to outer surroundings, a shift in consciousness occurs. This transformation is novel as concentration on mere ambient sounds is an atypical experience for most people most of the time. Reflection on this experience raises the question as to why we had not noticed these sounds before deep listening, and in this sense, we become aware of the behavioural patterns that guide auditory perception. That is, we become aware of being aware. For Maturana and Varela (1998), this act of reflection brings forth *knowledge of knowledge*, which "compels us to realize that the world everyone sees is not *the* world but *a* world, which we bring forth with others" (p. 245). Elliot Eisner (2002) argues that one of the functions of art is to provide "the conditions for awakening to the world around us" (p. 10). Awakening to the world around us necessitates an understanding of our own relationships to our surroundings and other people in it. Deep listening is one way of stimulating reflection on this relationship.

Technological devices can also be used to facilitate reflection on the relation of our conscious awareness to our environment. The same question could be asked about these tools: Did a shift in consciousness occur, and what is the nature of this shift? The data collected from the recording exercises at the high school provides some insights. In these workshops, participants had the chance to use powerful directional shotgun microphones, which zoom in and

amplify sounds from a specific direction. After returning from the soundwalks, participants seemed impressed by the loudness and intensity of background sounds like ventilation systems and their own footsteps. According to one participant, Kyla, "just hearing your own steps so loudly is so odd. You're so conscious of your movement." In this case, using a device to listen did lead to a shift in conscious awareness, and to understand the nature of the experience we can return to our discussion about differences in listening with the microphone and the ear. The ear is an integral part of the body's sensorimotor apparatus, selectively experiencing sounds in accordance to the entirety of one's being, while the microphone is indiscriminate and picks up a surplus of information. As a result, walking around and listening to your surroundings blaring from headphones can seem quite unusual. Furthermore, the ear is fixed in its position on each side of the head, whereas a directional microphone can be pointed in any direction. It is for this reason that we do not usually hear footsteps tapping right into our ears, so the "oddness" Kyla describes is not just due to loudness but also the distortion to the physiology of the body that occurs with the digital apparatus. Ultimately, it is through the body and nervous system that sound is experienced with either a directional microphone or the ear, so the notion of a disembodied experience is a fallacy. However, technology seems to offer a means of experiencing the body differently by augmenting our organic sensory system with digital machines. Other instances of these *differently-bodied* experiences occurred during the first soundwalk.

> *Mary*: "I can't tell who's talking. I'm not looking at you. It's kind of weird. It's a lot like the movies."
>
> *Neda*: "It sounds 'echoy' here."
>
> *Mary*: "It sounds like a horror movie."
>
> *Lucy*: "It's creepy."

These comments from the girls suggest that a common and familiar referent for this kind of experience is film, which is an artistic medium that exploits technology and the sensory apparatus of the body to create an altered reality. According to Mark Hansen (2004), it would be misguided to consider perception of lights and sounds we experience in a movie theatre as a disembodied experience, as perception intrinsically relies on affection, which is "a rich and evolving field to which bodily modalities of tactility, proprioception, memory and duration make an irreducible and constitutive contribution" (p. 101). Affectivity, therefore, requires the body "as a kind of filter that selects…according to its own embodied capacities, precisely those that are relevant to it" (Hansen, 2004, p. 3). In this light, the experience of the digital audio one hears through headphones is integrated into the complexity of the nervous system. In Mary's case, she became aware of an altered sense of proprioception as a result of using this technology, and for all the girls, the reverb in the hallway provoked emotional responses and conjured associations with horror films. In this case, technology enabled an altered sensory experience, which was framed and understood by the participants in relation to their previous knowledge and experiences.

One potential of exploiting new media technology in artistic practice is to create these types of altered sensory experiences, which reveal all perception to be anchored in the body. Hansen (2004) pointed to a number of new media artists whose "hybrid human-technology assemblages" explore the relationship of the act of seeing as an integral part of the body's sensorimotor apparatus. In Tamas Waliczky's *The Garden*, for example,

> A computer-generated animation depicts a 'synthetic' world oriented around the figure of a child who plays the role of point of view for the camera and thus anchors this point of view, and that of the spectator, within the space of the image. (Hansen, 2004, p. 108)

For the spectator, entering this virtual space is a strange and unfamiliar feeling as we are accustomed to being anchored inside our own embodied perception. Hence, experiencing a space from a child's point of view calls the spectator's attention to the embodied nature of the act of seeing. This is analogous to the experience of hearing sound with a powerful directional microphone. By having a digital ear that can be pointed in a given direction and amplify sound, attention is called to the embodied act of hearing. When doing listening exercises with the ear, we realize that our conscious awareness emerges from the interaction of internal and external worlds through the sensorimotor apparatus of the body. Technology can also facilitate a visceral encounter with this fact by allowing us to listen to the familiar in a different way.

5.4 Technology in the Classroom

The aphorism "the medium is the message," coined by Marshall McLuhan (1964), serves as a cautionary reminder that an understanding of the formal structures of new media is crucial in a technologically saturated world as these ingrained structures have an immense impact on how people and societies think and behave. In recent years, our interaction with digital devices that are capable of gathering, storing and transmitting sound, image and text has exponentially grown as a result of the pervasiveness of the Internet and mobile technologies. One consequence of this, as one QAIS teacher put it, is that "we're often so caught up with the world in our handheld devices" that we forget to interact with the person that is in front of us. Fortunately, artists and educators can play a role in the understanding and implementation of new media. A central aim of this research has been to theorize and experiment with a novel, creative way of using technology in the classroom. Specifically, I believe that by turning the sensory apparatus of digital devices to listen to and record the world around us, we can become aware of what McLuhan called "changes in sense perception." For McLuhan (1964), it is the artist who can "encounter technology with impunity" by being aware of these sense changes (p. 33). Art

teachers can raise students' awareness of patterns in sense perception by asking them to listen with the ear and microphone, compare these devices and think about how one's consciousness is guided by various sensory inputs: organic and digital.

As such, the educational benefits of the soundscape workshops are twofold: raising awareness of technology's impact on sensory experience, and promoting deeper engagement with everyday life and environments by listening carefully. This sentiment is summed up in Dan's comment, "using this technology that's within our grasp, I think, is a wonderful thing if we can tie it into the idea of what it means to be at our school based on sound."

Chapter 6: Conclusion

6.1 Listen

One of the key objectives of this thesis can be summed up in one word: listen. When you listen, you begin to notice the world around you a little more. You begin to reflect on your relationship to it, and how you construct the world as much as the world shapes you. When sitting next to a canal on a Tuesday morning surrounded by the cacophony of the city, you can start imagining *the thungs, bangs, rooomz and zooms* as a rhythmic composition. You begin to notice how modern people are impacting their soundscapes with little thought given to their relationship to these sounds. You may also become mindful of the impact of the sounds you make on your environment. Schafer (1977) pointed out that "the soundscape is no accidental byproduct of society; rather it is a deliberate construction by its creators" (p. 237). In Maturana and Varela's (1998) terms, we are bringing forth worlds with the sounds we create, notice, accept and reject. Through art and education, we can actively influence how we construct the world. One way of doing this is by engaging in the process of soundscape composition. This process begins with listening. Listening connects us to the here and now. Listening is an act of reflection on ourselves, and our relation to the world. Listening is an important aspect of our living being as a whole.

6.2 Summary of Research

Throughout the thesis, a number of pertinent questions have been addressed. The first of these questions is the most basic, but also the most important: Why teach art? Eisner's (2002) answer to this is art education can transform consciousness by helping us to notice the world, our environments and our own consciousness in a different way. In essence, the practice of composing soundscapes is rooted in the act of reflecting on our conscious awareness of the soundscapes we inhabit. When engaging in the act of listening and recording sounds, it becomes

evident that we tune out the vast majority of the sounds around us. This does not mean we do not hear these sounds, but rather that they exist outside of our awareness. Tor Norretranders (1999) illustrates that the amount of sensory information we are conscious of is infinitesimal in comparison to the sensory information that we receive, and suggests that we always rely on large quantities of *exformation* to make sense of the world. According to Maturana and Varela (1998), this process of knowing the world originates in the fundamental biological organization of all living beings, which are *autopoietic unities*. They assert that all acts of knowing and perceiving the world must take into account the living being as a whole, who brings forth the world with others. In this view, how we experience the soundscapes around us cannot be isolated from any other aspects of our being. What we see, hear, smell, taste and feel always influence how we hear. Merlin Donald (2001) adds the symbolic domains of culture and language as crucial components of our conscious awareness. In this light, the language we speak, where we were born and grew up, the books we have read and people we know are also part of how we perceive the world around us. Furthermore, all living beings are deeply connected to their environments, as these spaces influence our experiences, and we influence these spaces. As Murray Schafer (1977) pointed out, our soundscapes are a deliberate construction of our society. So, the power of this creative endeavour lies not only in raising awareness of our everyday soundscapes, but also in imagining and constructing different possibilities. The value of teaching *soundscape composition* in art classrooms is in "refining our sensory system and cultivating our imaginative abilities" in relationship to our everyday environments (Eisner, 2002, p.4).

The second question is about the relevance of sound in visual arts classroom. The answer should be self-evident that the senses are intertwined and deeply integrated with the entirety of one's being. According to David Howes (2014), the desire to separate and compartmentalize the senses is a modern phenomenon that reached its zenith in the nineteenth and early twentieth

centuries. However, there is a rich history of counter-culture movements among avant-garde artists, who rejected this view in favour a multisensory and multidisciplinary approach to artistic practice rooted in everyday life. Some practices of Dadaist, Futurist and Fluxus artists incorporated sound as a major component of poetry, typography, performance, happenings and musical compositions. Today, there is a diverse and multidisciplinary range of practices that fall under the general rubric of *sound art*, including experimental music, sound sculpture and installation art. This thesis specifically draws inspiration from the work of John Cage, Brian Eno and Janet Cardiff as multidisciplinary artists whose work offer insights on our relation to sounds and space. However, the pioneering work of Murray Schafer and his collaborators, and his successors in the field of Soundscape Studies, provides the basic framework for developing the process of soundscape composition. This field explores the relationship of people to their environment through the examination of its soundscapes, and presents a number of relatable strategies to facilitate deeper awareness of these soundscapes for art classrooms. Developing this awareness can enrich our experiences and engagement with quotidian spaces, and because all experience is inherently multi-sensory, sound cannot be isolated and excluded as an object of investigation in visual arts classrooms. There is growing sympathy for this point of view by advocates of Visual Culture (Chalmers, 2005; Efland, 2004; Tavin & Anderson, 2003) and Material Culture Studies (Bolin & Blandy, 2003), who argued Art Education should broaden its focus beyond canonical works of visual art to include the wide range of cultural production that influence youth in contemporary society. There is also a growing recognition by theorists in these fields (Bal, 2003; Duncum, 2004, 2012) that such examinations do not involve merely the sense of sight. Sounds, words, touch, affect and cognition are an integrated and inseparable part of how we experience visual culture, material culture and life in general. As such, one objective of this

thesis is to add to the chorus of voices calling to expand the field of Art Education beyond merely the study and creation of visual artefacts.

The final question relates to the thesis objective and question stated in the introduction. The basic aim of this thesis is to develop ways to integrate the process of soundscape composition in art classrooms, so this research seeks to identify salient creative and educational features of the process. To this end, a Design-Based Research methodology was implemented to design, test and refine a series of workshops, in which participants partook in composing a soundscape. In the autumn of 2013, a series of four workshops were conducted at a high school with groups of young students. After this initial phase, the workshops were re-designed into an intensive single-session workshop, which was carried out with a group of art and music teachers from the *Quebec Association of Independent Schools* in the winter of 2014. The data collected from these two phases was analysed to answer the thesis question. The analysis and interpretation of data focused on both the practical application of this process in educational contexts (see Appendix 1), and theoretical questions about the nature of the conscious shift that occurred as a result of engaging in this process. One critical finding is that when we listen deeply to our surroundings, we notice sounds more discerningly. This practice can be applied in educational contexts to raise awareness of the soundscape of the school. The term *soundmark* proved useful for achieving this as it gave participants the directive to seek sounds that defined their relationship to the environment of their school. Furthermore, the use of technology for recording led to a shift in conscious awareness. By using a digital ear, which can be pointed in any direction to indiscriminately amplify sound, an altered sense of embodiment occurred. These devices can allow us to experience and listen to the familiar in a different way. They can be used to raise awareness of the simple act of hearing in everyday life. Digital technologies are now a pervasive aspect of life for many young people. McLuhan (1964) argued that technology has a

profound impact on our sense perception. Artists and educators can play a vital role in raising awareness of our relationship to these technologies and our daily environments. Today, digital devices are increasingly becoming an integral aspect of what it means to be a living being as a whole.

6.3 Implications

There are a number of important implications for the field of Art Education. First of all, this thesis argues that the visual arts are not merely visual, and other senses can play a part in art education. There are numerous precedents of artistic practice that explores sensory multiplicity, and multimodal media pervade. If contemporary artistic practices and visual culture are to be included in visual art curricula, then senses other than the visual inevitably play a role in our understanding of these practices. In this view, learning to listen carefully is as important as learning to interpret imagery. Understanding movies, videos, music, websites, paintings, sculptures, performances and installations requires us to look as well as to listen. These senses are an integrated part of our being as a whole. As such, the visual arts are also auditory, tactile, affective, intellectual and cognitive.

Another vital question that has been explored throughout these pages is the relation of consciousness to learning. Eisner's position that the value of art education is in transforming consciousness implies that one way we learn through the arts is by becoming more conscious of what typically escapes our awareness. Conscious awareness is at the heart of all learning:

> Learning new things, for example, is largely a matter of conscious awareness. Enfolding such knowledge into one's life, however, is often a less conscious event. For instance, conscious awareness is usually needed to make sense of rules of grammar, to expand vocabulary, or to discern the standards of acceptable behaviour

in a new setting. Yet, at some point, such explicit learning must fade into one's fluid patterns of acting. (Davis, Sumara, & Luce-Kapler, 2008, p. 26)

What can we learn by focusing on sounds we usually tune out? For one, the acts of listening and hearing are part of our fluid patterns of being. The sounds that surround us define our relationship to our environment, yet our awareness of these sounds is conditioned by patterned behaviour. Through art, we can intervene in this process and notice our listening habits. Students in a school, for example, can listen, record, edit, and present soundmarks that define their relationship to their school. This is one way artistic practice can refine our sensory system and make a unique contribution to "our experience with and understanding of the world" (Eisner, 2002, p. 4). The growth and prevalence of digital technologies today is making this a pressing issue. The computer has been shrunk in size to fit inside our pockets. Digital mobile devices, such as smartphones, have added a new layer to our sensory experiences. Most of the time, these devices are used to tune out our quotidian environments and the people in it. Art educators can play a vital role in raising awareness of the relation of our nervous system and technology to our environment. One way of achieving this is by using these devices to listen.

6.4 Future Directions

This Master's thesis has aimed to develop strategies for teaching soundscape composition in the art classroom. The findings confirm that listening to soundscapes of familiar environments is a valuable exercise for deepening our awareness of and engagement with these spaces. Furthermore, technological devices can be used to shift sensory perception by enabling amplification and manipulation of sound. This raises key questions about the impact of technology on our conscious awareness of daily environments, in general. I am pursuing a Ph.D. in Art Education to expand on this Master's thesis by conducting research on how smartphones can be used to better connect teenagers and young adults with their everyday aural environment.

The Doctorate research will specifically focus on mobile devices because of their influence on our habits and awareness of the world around us. Smartphone ownership has significantly risen in recent years, and these devices are increasingly being used for their multimedia functions such as photo sharing, and playing music. Yet in most quotidian contexts, such as a daily bus ride, we can witness individuals using these devices to create an isolating sensory bubble, detached from their environments. For instance, the ambient sounds of the urban, public spaces we occupy daily provide a rich array of sounds that we tune out with our headphones. This results in an *auditory bubble* that isolates individuals from their environment, creating a disjunction between the interior and the exterior worlds (Bull, 2005). This may also mean that our relation to ambient sound has become more unconscious (Treasure, 2007). Listening consciously to the world is a crucial part of being a participatory citizen, as well as a full human being as sound connects us to our environments, our societies and our being as a whole. Thus, listening consciously needs to play a more significant role in education. The Doctorate research aims to develop creative and educational interventions that can inspire us to listen more carefully, and thereby, engage more deeply with the world around us and the people in it.

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Appendix 1—Teaching Plan

Keywords	1. *Sound Art*: An umbrella term that describes a range of interdisciplinary practices that use sound as a central component. 2. *Soundscapes*: The study of the interrelationship between sound, nature and society (Westerkamp, 2002). 3. *Soundscape Composition*: The creative process of listening, recording, editing and presenting soundscapes in art classrooms. 4. *Soundwalk*: An excursion whose purpose is listening closely to the environment (Westerkamp, 2007). 5. *Soundmarks*: Sounds that are unique and important to a particular community (Schafer, 1977).
Example Artists and works	*Sound Art* 1. Hugo Ball (Sound Poetry), Luigi Russolo (*Intonarumori*) 2. John Cage (*4'33"*) 3. Brian Eno (*Music for Airports*) 4. Janet Cardiff (*The Forty Part Motet*) *Soundscape Studies* 5. Murray Schafer 6. Andra McCartney (*River Writing*) 7. Hildgard Westerkamp (*At the Edge of Wilderness*)
Procedures	I have found it fruitful to start with a presentation to define keywords and provide examples of sound art and soundscapes, followed by

	listening and recordings activities. The recorded sounds can also be edited and presented as audio recordings, installations, performances or video art. 1. *Listening*: Start by asking, "what are the sounds in this room?" Note the sounds, then remain silent and focus on the ambient sounds. Ask again, "what are the sounds in this room?" 2. *Recording*: Go on a soundwalk. This excursion begins with listening carefully to the room, and then going outside to explore the space with the ears. Participants can be asked to seek soundmarks of these spaces to record. 3. *Editing*: The collected sounds can be mixed, edited and transformed by using digital devices. Examples of visual art can be used to inspire creativity in the editing stage. M.C. Escher's woodcut *Night and Day* is particularly effective for this purpose as it uses repetition, contrast and symmetry to transform an ordinary scene. 4. *Presenting*: There are a number of creative possibilities for presenting the edited work. This work can be presented as an audio file or integrated with various visual media such as video, installation or performance.
Discussion Questions	Discussion questions can be asked at the beginning of the process to elicit interest, during the process to stimulate thought and creativity, or at the end to consolidate learning.

	1. What are some sounds you enjoy? 2. What are sounds you dislike? 3. What sounds do you hear in this room? 4. What sounds are important to you? 5. What are some sounds that are usually around you, but you do not notice? 6. In what ways is sound similar to and different from other media (drawing, paintings, sculpture, etcetera)? 7. How can you incorporate sound in your artistic practice?
Equipment and Software	Depending on access and time, various devices and software can be used in the recording and editing stages. 1. Mobile Devices: iPhone, iPod or iPad with GarageBand. There are various application options for Android phones such as Easy Voice Recorder, RecForge Pro, Miidio Recorder. 2. Recording Devices: Digital audio recorders, such as the Edirol R9, can be used. Directional shotgun microphones can also be used with portable hard drive recorders, such as the Sound Devices 702. 3. Computer Editing Software: GarageBand (MAC), Audacity (PC).

Appendix 2—Certification of Ethical Acceptability

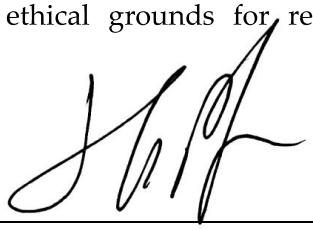
UNIVERSITÉ Concordia UNIVERSITY

CERTIFICATION OF ETHICAL ACCEPTABILITY
FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant:	Ehsan Akbari
Department:	Art Education
Agency:	N/A
Title of Project:	Let's play it by ear - An art curriculum for "sound art"
Certification Number:	30001700

Valid From: August 15, 2013 to: August 14, 2014

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.



Dr. James Pfaus, Chair, University Human Research Ethics Committee

Appendix 3—Sample Interview Questions

First Iteration—High School

Initial focus group questions:

1. What are some sounds you enjoy?
2. What sounds do you dislike?
3. What are the similarities and differences between sound and visual arts?
4. Are there textures and colours in sound?
5. How can you use sounds artistically?
6. What are the sounds in this room?

Final interview questions:

1. How will you use soundscapes in the future?
2. What did you learn from this experience?
3. What was your favourite part of this experience?
4. Do you see any connections between music and visual arts?

Second Iteration—QAIS Art and Music Teachers

Initial discussion question:

1. What are the sounds in this room?

Final discussion questions:

1. What aspects of the workshop can you use in your classroom?
2. How can you represent the soundmarks of your school?
3. How can art educators use sound in their teaching?
4. How can technology be incorporated in this process?
5. What do students learn from engaging in this process?