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Soundfullness in early childhood education: An ecological sound art inquiry with educators and children

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A thesis submitted in partial fulfillment of the requirements for the Master of Arts degree in Education

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Abstract

Sounds exist everywhere, and early childhood classrooms are no exception. Sounds resonate with us, and sometimes they move us. However, engagement with sound has a limited trajectory. This thesis traces movements from a sound inquiry in an early childhood centre through three research questions: (a) How is sound consumed and produced in ECE? (b) What other ways of being might be enacted through sounds and ecological sound art in ECE? (c) How might sound become an agentic entity through pedagogical documentation and digital technology? The inquiry took a multimodal approach using text and sound, and embraced methods of ecological sound art, common worlding, and pedagogical documentation. Guided by the research questions, I offer interpretations of the sonic data to examine what sounds from the everyday do in a classroom. Sonic data are included to allow readers to listen to the classroom installations and experience new movements and thinking.

Keywords: common worlding, early childhood education, ecological sound art, sonic worlds, place

Summary for Lay Audience

This study examined audio-visual data from an early childhood education project in a southwestern Ontario childcare centre. In response to copious visual data that was collected at the research site, this study examined audio data collected during a one-month material inquiry with children. The inquiry used ecological sound art installations to examine the way children engage with sounds that surround them. This thesis examines movements from the one-month engagement to answer three research questions: (a) How is sound consumed and produced in ECE? (b) What other ways of being might be enacted through sound and ecological sound art in ECE? (c) How might sound become an agentic entity through pedagogical documentation and digital technology? This study was embedded in a common worlding and ecological sound art theoretical framework and used a postqualitative approach to analyze findings. The thesis proposes sounds as possessing agency in the early childhood classroom and concludes with considerations to rethink what sounds do in early childhood education.

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Table of Contents

Abstract.....	ii
Summary for Lay Audience.....	iii
Acknowledgments.....	iv
Table of Contents.....	vi
List of Figures.....	ix
Chapter 1.....	1
1 Introduction.....	1
1.1 Positionality.....	2
1.2 Research questions.....	4
1.3 Significance.....	4
1.4 Literature review.....	5
1.4.1 Music and entertainment.....	5
1.4.2 Songs of knowledge.....	6
1.4.3 Phonemics awareness: Sounding the words.....	7
1.4.4 Developmentalism.....	8
1.4.5 The problem with sounds in ECE.....	9
1.4.6 Sounds in Ontario’s curriculum documents.....	9
1.4.7 Sound as data in research.....	11
1.5 Theoretical framework.....	12
1.5.1 Common worlding.....	12
1.5.2 Ecological sound art.....	13
1.6 Structure of the thesis.....	18
Chapter 2.....	20
2 Methodology.....	20

2.1	Postqualitative approach	20
2.2	Methods.....	23
2.2.1	The research project.....	24
2.2.2	Research site	24
2.2.3	Co-inquirers	25
2.3	Data collection methods.....	26
2.3.1	Pedagogical documentation	26
2.3.2	Methods of attuning to sounds through art	27
2.4	Research design considerations	27
2.4.1	Week 1: Pedagogical orientating	28
2.4.2	Week 2: Ideation	31
2.4.3	Week 3: The concept	32
2.5	Research design—Week 4—Intensive	34
2.5.1	Sound art #1	35
2.5.2	Sound art #2	37
2.6	Ethical considerations	38
2.7	Chapter summary	39
	Chapter 3.....	40
3	Findings.....	40
3.1	Children's engagement with sounds.....	40
3.1.1	Ophelia's encounters with the installation	41
3.1.2	Benny encounters the installation	42
3.1.3	Walt's, Kate's, Shane's, and Maria's encounters with the installation	43
3.1.4	Engagements with sound in the latter half of the intensive week.....	44
3.2	Four moments from children's engagement with sounds.....	45
3.2.1	Cardinal loop.....	46

3.2.2	Drain loop	48
3.2.3	Jackhammer interruption	50
3.2.4	Educator as channel	53
3.3	A chorus of the findings (Analysis)	55
3.4	Summary	57
Chapter 4	58
4	Conclusion	58
4.1	A sound inquiry.....	59
4.1.1	How is sound consumed and produced in ECE?	59
4.1.2	What other ways of being might be enacted through sounds and ecological sound art in ECE?	60
4.1.3	How might sound become an agentic entity through pedagogical documentation and digital technology?	60
4.2	Significance of the findings	63
4.3	Further research	63
4.4	Final thoughts.....	64
References	66
Curriculum Vitae	73

List of Figures

Figure 1. Sound as perceived by human ears.....	16
Figure 2. Notes on Bennett (2010, p. 97) in watercolour on paper.....	17
Figure 3. Educators' pedagogical offering.....	30
Figure 4. Intensive week orientation and information poster.	34
Figure 5. QR code access to aural artifact for Day 1.....	36
Figure 6. QR code access to aural artifact for Day 2.....	38
Figure 7. Approaching the subwoofer.	43
Figure 8. Kate pointing at the projections of sounds.....	44
Figure 9. QR code of the cardinal_loop.mp3.....	46
Figure 10. QR code of drain_loop.mp3.	49
Figure 11. Cloth material engagements with sounds.....	51
Figure 12. Mapping of all sounds in the classroom.....	51
Figure 13. Digital documentation of jackhammer and sound art sound.	52
Figure 14. (Left to right) Child, educator, and sonic object from sound installation.	55
Figure 15. Educators attune to the world with other educators and children.	55
Figure 16. Waveform of sounds from a 26.5-minute audio file.	64
Figure 17. QR code for 26.5-minute audio file.....	65

Chapter 1

1 Introduction

Sounds exist everywhere, and early childhood education (ECE) classrooms are no exception. Sounds resonate with us, and sometimes they move us. Gilmurray (2017) suggests:

When we emerge from the possible worlds . . . generated through our listening, we do not do so into the version of the world we previously inhabited . . . since the new thoughts, perceptions, and sensations that we have experience[d] will be carried forth into the actual world, creating [an actuality imposed by new possibilities]. (p. 39)

Paterson's (2008) ecological sound art titled "Vatnajökull (the sound of)" connected listeners to the melting Vatnajökull glacier. It is impossible to see that a glacier is melting, and it takes years to see the impact of climate change on a melting glacier. Visual comparisons imply that the depletion of a glacier is a sudden, monumental event rather than a slow, constant process due to anthropogenic activity. However, the perception that ecological depletion is sudden was disassembled and reframed when listeners called in on a phone line that played live recordings of the glacier melting. Perception extended, allowing listeners to engage with ecological realities and possibilities. After attending to sound, the listeners could begin to notice previously unnoticed relations between the rising temperature of the world and a slow-melting glacier.

Drawing inspiration from Paterson's (2008) work, this thesis traces movements from a sound inquiry in an early childhood centre in southwestern Ontario. My research was a part of the Climate Action Childhood Network (CACN; <http://www.climateactionchildhood.net/>). Composed of a series of "collaboratories" (collaboration + laboratory; Muff & Williamson, 2014) experimenting and researching climate change responses in ECE, this international network was funded by the Canadian government's Social Sciences and Humanities Research Council (SSHRC) and directed

by Dr. Veronica Pacini-Ketchabaw. My research contributes to the collaborative Witnessing Ruins of Progress, which “experiments with pedagogical methods to notice and document what is going on around us” in southern Ontario (CACN, 2020). The Witnessing Ruins of Progress collaborative is “committed to rendering relations between the human and the more-than-human world (which is too often obscured in educational contexts) visible, audible, comprehensible, even tangible for children” (CACN, 2020). In doing so, it “promotes a collective, multitudinous engagement with, and appreciation of, the precarious complexity that characterizes the delicate balance of our ecosystem” (CACN, 2020).

This thesis notes the events that occurred in the sound inquiry. They were catalyzed by resisting the visual artifacts in the field of ECE research. I and my co-inquirers—two educators and six infants—began to think about how we attune to sounds and how we might rethink sound relations in ECE. More specifically, I considered how engaging with sounds might ecologically reconnect us to the in-between, unheard, misheard, or silenced frequencies in ECE and its movements. This thesis reimagines sounds in early childhood assemblages and proposes alternatives to the ECE curriculum to invite new ways it might engage with sounds.

1.1 Positionality

I jñāna (Sanskrit: ज्ञान, come to cognize, or come to know) this thesis as a “string figure” of my thoughts, experiences, discussions, conversations, and readings on sound and the sonic for the past two years. The ideas in this thesis are temporal, like Haraway’s string figures (2016). The ideas are tenuous and become loosened as the strings come undone. The propositions and ideas on sounds in this thesis hinge on the onto-ethico-epistemological (Barad, 2007) strings that relate to my subjectivity and have cocreated the conditions for considering a cacophony of sounds “thinging” (Voegelin, 2021) as coactants in an early childhood assemblage. Thinging is a borrowed concept that allows space to think with sounds as agents that enact upon and are also moved by other subjects of the assemblage. This shifted conceptualization of sound has created opportunities to engage with curriculum making that considers climate-related issues in the pedagogies

and curricula in ECE. I have visualized the movement of my thinking and ideas in this research as threads from different sonic locations, engagements, and thinking, which came together in an unruly and undisciplined game of cat's cradle. In this webbed conceptualization of sound, the configuration differs from the game of cat's cradle. Instead of knowing what is coming, the threads and webs emerge through playful experimentation with sonic concepts.

The way I came to sound in ECE is one of the threads that forms the sonic reconfigurations. In 2020, Vintimilla and Pacini-Ketchabaw (2021) employed threading and threads as metaphorical devices to weave curriculum as a retrospective and prospective process that unfolds through documentation. They utilized the act of weaving with the metaphorical threads during a gathering of pedagogists, who are people deeply engaged in pedagogy to support educators working with children and families (Vintimilla, Pacini-Ketchabaw, & Land, 2021). The imagery left a deep impression on me. The way a thread weaves in and out and becomes frayed by exposure and handling only to be put back together with stories and memories is how I imagined sounds in ECE.

As I took on roles in the research project related to sounds, such as transcriber, video recorder, audio recorder, and more, I realized my predilection for the sonic was not surprising. I come from a context steeped in sonic waves. Although I never took up an instrument, my father enjoys playing the guitar; my sister is a classically trained pianist with perfect pitch; my mother, a classically trained Bharatanatyam dancer, is especially attuned to *surds* (voiceless consonants) and *raag* (a unique and central feature of the classical Indian music tradition). My mother recalls how I developed in her womb rocking to 1980s rock music. I began breathing and singing with my mother and my mother's mother, creating moments of unforgettable lifelong teachings of philosophy and ways of being. I remember twilight mornings with my grandfather, whose attempts to impart discipline and consistency through a rigid military routine taught me to stay with moments of trouble. My dislike of this routine was punctuated by the chirping of local birds, barking of street dogs in the distance, and the muezzin's call to prayer. I carry many of these sonic moments with me as I move through every day. I remembered such moments from my childhood during the engagements in the research project.

Although these introductory anecdotes may seem romantic, they note the everyday as being always embroiled within the complexity of sounds in daily occurrences. They set the affective and complexifying tone by which this thesis has followed sounds in ECE. I will argue that the literature highlights sound as embedded in sanitized discourses of child development in ECE. I propose an expanded conceptualization of sound for the field of ECE through careful engagement with educators, children, sounds, and interdisciplinary literature on sound and the sonic.

1.2 Research questions

Three questions guided my inquiry into children's possible sonic worlds. The questions emerged through common worlding and ecological sound art theoretical frameworks: (a) How is sound consumed and produced in ECE? (b) What other ways of being with sounds might be enacted through ecological sound art in ECE? (c) How might sound become an agentic entity through pedagogical documentation and digital technology?

1.3 Significance

Paterson's (2008) ecological sound art "Vatnajökull (the sound of)" built a powerful metaphor that repositioned the listener as part of nature. Compared to visual environments, acoustics impose an implicated perception on our common relations. Therefore, it becomes less easy to assume a bird's-eye view or a nature versus culture perception. Ecological sound art presents a medium through which sounds could complexify and make aware implications in ecological inquiries by giving voice to otherwise unheard, silent, or ignored sounds (Gilmurray, 2017; Voegelin, 2021).

My research examined entanglements of an ecological and common worlding nature with educators, children, and families. Engagement with sounds that surround us are significant moments that saturate ECE. My research responded to the sounds already there and proposed rethinking and reimagining relations with sounds through ecological sound art in ECE. The goal of my thesis was to investigate sounds entangled and implicated in ECE practice through sound data. Specifically, it involved sound data

collected from recent research (CACN, 2020) that contemplated environmental precarity through the lens of common worlding pedagogies in ECE.

I employed a common worlding (Taylor, 2013) and ecological sound art theoretical framework (Gilmurray, 2017; Voegelin, 2021) to guide the research. Methodologically, I took a postqualitative approach (Braidotti, 2013; Lather, 2013; Lather & St. Pierre, 2013; Le Grange, 2017) that guided the research in complexifying the ecological relations with our common worlds. Ecological sound art and pedagogical documentation (Pacini-Ketchabaw et al., 2015) enabled the sound inquiries and the documentation of the interconnected and implicated process of reimagining livable worlds.

1.4 Literature review

In my experience as an educator in ECE, unintelligible, unnamed, unrecognizable sounds rarely lead to a pedagogical orientation connected with education and curriculum. Despite what these sounds offer for curriculum making, in my experience educators more often use sounds to entertain children and develop human language, which aligns with the literature review on the use of sound in ECE. Current approaches take for granted the possibilities sound presents. Because sounds are ever-present, I believe inquiring into how they are taken up in ECE is worth exploring. In this thesis, I discuss how attuning to how sounds are taken up as entertainment or for the sake of developmental milestones may pose resistance and lead to a pause, creating spaces to trouble ECE's habitual ways of being with sound. More specifically, I discuss how we have resisted habituated ways of being with sounds. The literature review notes how ECE consumes and produces sounds.

1.4.1 Music and entertainment

Music is an integral part of the early years and education. Curriculum (Ontario Ministry of Education [OME], 2014a, 2014b, 2016) and preservice training include a multitude of suggestions on incorporating music into the day-to-day activities of children in a classroom as ways to support language acquisition, learning, and fun.

Another purpose of musical sounds in early childhood classrooms is as a tool for emotional regulation and entertainment (Foran, 2009). Sounds as music to distract and entertain children are common practices in early childhood classrooms. When infants begin crying, educators will pick up the children and try to soothe them by singing rhythmic verses or playing them through a sound player. Sometimes educators bring attention to sounds supported by visual movements. These movements can be body gestures like waving hands. More common in the last decade has been the use of multimedia, thus increasing the consumption of videos in addition to sounds in children's lives in and outside of the classroom. Visuals amplify particular sounds, and sounds without a visual are obscured and made "dark and forbidding" (Voegelin, 2021, p. 3). We—the children, educators, and researcher in this study—reflected on how we might mitigate "watching-the-show" entertainment habits, a term meant to encompass how engagements with sounds often devolve into hearing sounds to fill "busy time." Particularly, I pull from my experiences as an ECE educator where sounds are played when there is simply nothing to do. Using sounds as entertainment occurs when we listen to music or play musical instruments, both of which are, in part, an act of entertainment.

Music in ECE can emerge from enjoyment and fun where there may or may not be a deeper meaning to the engagement. I considered whether music was compatible with a common worlding and ecological sound art approach. Common worlding acknowledges the need to examine more-than-human-children ecologies as entangled and complicated (Taylor, 2013). However, music requires manipulation of chords, notes, pitch, and more. Music is ordered and clear often opposite to noise that may hint at disruptions and unrest. Music is a kind of sonic abstraction I attempted to resist in an effort to challenge traditions from positivist research methodologies. Musical manipulation was not a part of the research because it would reduce ecologies into units and variables (Burman, 2016), consequently sanitizing the contextual nature of sound.

1.4.2 Songs of knowledge

We encounter songs of knowledge during everyday ECE practice. Educators often sing songs of knowledge to children, and the purpose of these songs ranges. Sometimes songs are sung to familiarize children with the names of their peers or make a process such as

cleaning up more enjoyable, and at other times, they are sung to simply explore parts of language and practice speech (Bolhuis & Everaert, 2016; Tsang, Falk, & Hessel, 2016). In this way, engagements with sound take place through listening to and singing songs. The purpose of these songs is related to the facilitation of habits (Kern, Wakeford, & Aldridge, 2007). This is not a new concept. I am attracted, however, to traditions of sounds around the world, where songs impart wisdom, histories, and knowledges of being and becoming that are integral to living with others. Most notable are songs of wisdom passed down by Black women to survive (Berry, 2017). Similarly, Indigenous peoples on Turtle Island (Canada and the United States) engage in oral traditions that impart knowledge through songs (Gillreath-Brown, 2019), which are being reclaimed and more recently revitalized through public engagement on social media. In this research project, nonhuman sounds such as bird calls, the earth's rhythms, the wind's voice, and more are assumed to be as filled with meaning and knowledges as human utterances of songs.

1.4.3 Phonemics awareness: Sounding the words

Research (Biancone, 2019; Elbro & Petersen, 2004; Wolf, 2015) in ECE curriculum and pedagogy has examined sound mainly as a mode of communication and entertainment and as an indicator of developmental milestones. Research on children's early literacy (Biancone, 2019; Elbro & Petersen, 2004; Wolf, 2015) has described the significance of sounds for communication. In the last decade, children's early literacy has gained impetus worldwide—to which research and childcare governing agencies have responded with measuring tools to gauge children's phoneme awareness and letter-sound knowledge (Ozernov-Palchik et al., 2018). In other words, children's ability to recognize sounds of the alphabet and produce these sounds to communicate have remained the focus of ECE research in relation to sounds. The same skill-measuring tools also suggest “appropriate” interventions for children deemed to require extra support to enable “typical development” of communication skills (Hulme et al., 2012; Ozernov-Palchik et al., 2018). It is common for research to test tools of the trade that educators can apply in classroom settings to encourage the development of children's communication skills (Kaminski & Powell-Smith, 2017). These tools for intervention are typically

interpersonal methods of teaching aided by technology to reinforce children's phoneme awareness and letter-sound knowledge. These methods generally rely on repetition to learn the sounds and build phonemic awareness. Thus, children seem to sound out words.

The ECE context in Ontario takes up sounds to encourage phonemic awareness. ECE focuses on labelling the causality of sounds to build children's phonemic awareness and their speech ability (Gallagher et al., 2018). Although this is an important skill as language builds and expands worlds (de la Cadena & Blaser, 2018), there is a problem with such methods of approaching sounds. Current methods take sanitized approaches to engage with sound and passively engage with curriculum guidelines. This is a missed opportunity to build a curriculum as phonemic practices take over "teachable moments" due to overwhelming attention paid to sounding out the word. Subsequently, the potential of sounds is muted. As is evident in oral traditions, sounds are more than a tool for literacy. What possibilities might emerge when ECE classrooms in Ontario use sounds with children beyond attending to the phonemic sounds of onomatopoeias? What happens when educators use an approach with sounds that asks questions of an ecological nature? These are vital questions considered in this thesis.

1.4.4 Developmentalism

A pitch or frequency characterizes sounds, and some people are more likely to hear some sounds than others. Sounds evoke corporeal responses in both humans and animals (Hoye, 2020). Even plants are known to respond to sounds (Gagliano et al., 2012). Bioacoustics as a field of study has engaged extensively in following how sounds affect the more-than-human. Mothers' hearts race when they hear the pitch of a crying baby (Giardino et al., 2008). White-tailed deer tune into a particular pitch to ensure their species survives (Hoye, 2020). The ability to respond to audio cues is an important developmental skill. It is often cause for an intervention when children do not respond to audio cues such as cooing and babbling. Whether the bodily focus and response to distress calls is one of survival or not, at a site where place-based approaches or orientations are important, we consider the audio cues from place, and how we can attune to sounds that surround us and alarm us.

1.4.5 The problem with sounds in ECE

The literature reveals that how children and educators use sounds in ECE is problematic. Educational research is anchored in developmental psychology (Burman, 2016), in which engagement with sound happens exclusively in a prescribed manner (OME, 2014a, 2014b, 2016). Approaches that take up sounds as music and entertainment, phonemic awareness (sounding the words), and developmental markers do not acknowledge the subjectivity of sounds in the ECE setting. Unfortunately, this lack of acknowledgment results in a system of engagement with education that is blind to the uncritical and undemocratic nature of typical approaches. Brownell (2019), in a work that engaged with children's everyday sounds, identifies the struggle to not demand "quiet" in place of what she may have instinctively qualified as "noise" (p. 568). The prescribed methods of engaging with sounds do not acknowledge the situatedness of sounds.

Furthermore, by only acknowledging human-made sounds, ECE engages through anthropomorphized sonic engagements. To decenter the human and think with others, I problematize the current movements in ECE with sounds. Problematic movements are reflected in curriculum documents as phonemic development and entertainment and continue in ECE practice.

1.4.6 Sounds in Ontario's curriculum documents

The document *How Does Learning Happen? Pedagogy for the Early Years* (HDLH; Ontario Ministry of Education, 2014b) describes itself as "a professional learning resource guide about learning through relationships for those working with young children and families. It is intended to support pedagogy and curriculum/program development in early years programs" (OME, 2014b, p. 5). *Early Learning for Every Child Today* (ELECT) is a framework for Ontario's early childhood settings created by the Ministry of Education. It is "intended to complement . . . the Ontario Day Nurseries Act, Ontario Early Years Centre guidelines and the Kindergarten Program" (OME, 2014a, p. 1). The full-day kindergarten guiding document *The Full-Day Early Learning Kindergarten Program* (OME, 2016) "sets out principles, expectations for learning, and

pedagogical approaches that are developmentally appropriate for four- and five-year-old children and that align with and extend the approaches outlined in HDLH” (p. 5).

These documents impose on the educator ECE and pedagogical practices. Sometimes they limit the extent to which educators engage with pedagogical issues in their classes. Educators in licensed childcare centres in Ontario must carefully navigate the tension between fulfilling Ministry requirements and following pedagogical inquiries.

HDLH (OME, 2014b), ELECT (OME, 2014a), and *The Full-Day Early Learning Kindergarten Program* (OME, 2016) impose on educators an extremely specific conceptualization of sounds and their role in pedagogical practice. The documents set expectations in which children must listen to their peers to negotiate their interactions and movements, listen to other children’s ideas without interruptions or distractions, listen to stories told to them by educators, and listen to music to sing along with it. The purpose of listening, however, is to listen to the sound of words. The documents describe an overwhelming focus placed on children’s phonemic awareness and ability to reproduce sounds for literacy. Even when attending to music in ECE, the HDLH (2014b) document encourages educators to highlight the sounds of words in music, songs, and rhymes.

The documents demand that educators listen to, observe, and record children’s vocal arrangement of sounds. The documents set a singular normative expectation of listening to sounds in early childhood, extensively emphasizing that educators listen to children to extend vocabulary and phonemic awareness. As such, the work of educators reflects the singular strands emphasized by the curriculum documents. Educators appear deaf to the disparate symphony of sound. Neglecting sounds that have purposes apart from developing children’s phonemic awareness delegitimizes sound conceptualizations that are beyond representational words.

It is important to understand the reason why sounds are listened to. After all, sounds also inform the material relations the curriculum documents impose on children and educators. This reality does not simplify how we perceive, listen to, and produce sounds, but it asks us to consider how we take for granted the practice of listening to human and nonhuman others. Furthermore, it asks us to consider that listening to and producing

sounds is a practice that is not just a tool for human development; rather, sounds are a phenomenon through which we relate to others and by which we mark the importance we give to others in relation to our own body.

1.4.7 Sound as data in research

In research practices, sound as data is made available as transcriptions (Tessier, 2012), which is true in most research into ECE. Most sounds from our everyday lives have signifiers in the English language; others that do not have orthographic representation and are spelled phonetically. Another way transcribers write sounds involves descriptions of a sound based on what it was caused by (Gallagher et al., 2018). Onomatopoeic references are also used to transcribe sounds, which is another form of transcription. Then there are sounds from research that are not transcribable and are labelled “unintelligible.” Sounds are called unintelligible when we cannot distinctly recognize a single sound amid multiple others layered onto it, all captured indiscernibly by the recording device. Yet, this is how sounds occur naturally (Voegelin, 2021). Sounds persist, travelling for some distance, and we hear them always with other sounds.

Using descriptors that allow the reader to imagine the sound from their own memory, researchers find ways to transcribe and describe sounds pertinent to a study. However, this remains true only in the case where a single sound stands out from the others.

There are words that describe multiple sounds, but in education, more than one sound is often described as noise or a cacophony (Radovac, 2015), which has negative connotations to what is in the realm of the heard. These sounds are often perceived as not worth attending to. Brownell (2019) questions the description of sounds as “noise” in her work that examined children’s identities in complex sonic ecologies. She asserts that this perception of sounds as noise is tied to the politics of sounds. For example, while music relays a sense of order or beauty, sounds that are not in harmony or a particular order or hierarchy create a sense of chaos. Noise construed as *disruption* is perceived to hinder children’s ability to become productive members of a classroom (Brownell, 2019). However, chaos is more than simple disorder. In one instance from her research, noise was “read as a political act as the noise nuisance he [a child] produced disrupted the

majority of his peers” (p. 568). In other instances, noises are the others that have always been there and are heard despite forces that seek to silence them (Radovac, 2015). Within the field of research related to sounds, sonic dissonance offers diversity and at times symbiosis between organisms.

The inquiry described in this thesis examined indescribable sounds, sounds that had no words, sounds overlapped by other sounds, and unclear sounds. In examining these sounds, we hoped to resist the visually available data and bring to the forefront aural artifacts that otherwise would have been archived.

1.5 Theoretical framework

Two theoretical approaches influenced my research: first, Taylor’s (2013) common worlds theoretical framework, and second, Gilmurray’s (2017) ecological sound art framework.

1.5.1 Common worlding

Taylor (2013) proposes the concept of common worlding pedagogies as a way to expand the inclusion of relational ethics in ECE and permit living with difference. Her concept, therefore, examines human/more-than-human relations and the intra-action between humans and more-than-humans. The more-than-human category includes mammals, birds, amphibians, cyborgs, materials, places, and more (Burman, 2016; Haraway, 2016, 2018). Humans and more-than-humans in this framework are recognized as coactants. Furthermore, common worlding approaches recognize that coactants exist in tandem, that is, neither can exist without the other. As such, a key aspect of common world conceptualizations is examining the ethics and politics involved in children’s ecologies with more-than-human others (Pacini-Ketchabaw & Nxumalo, 2015; Taylor, 2013).

Common worlding echoes posthumanist and feminist theorists (Deleuze, Guattari, & Massumi, 2013; Foucault & Gordon, 1980; Haraway, 2016, 2018; Latour & Porter, 2009; Lenz Taguchi, 2012) and encourages us to think beyond the human as a central point of interest. Therefore, common worlding in ECE decenters the human child as the focal point of interest and expands children’s more-than-human relations

The common worlding approach acknowledges the significance of place upon which children, as part of an assemblage, gather or collect and enact pedagogies.

Acknowledging and understanding the history and politics of the location is significant because the location strongly affects the values and beliefs upon which educators, children, and families enact their day-to-day lives. Of course, it remains important to acknowledge that our relations are rarely stable or consistent, and so reexamining, or, in other words, staying with the trouble (Haraway, 2016) of understanding where our values and beliefs come from and how they are formed is an important feature of a common worlding approach. Common worlding pedagogies depart from Rousseau's portrayal of nature's child. Instead, they contextualize education as a political and ethical project. In such a worldview, to keep children safe or imagine the child as innocent, pure, and devoid of outside influences is impossible (Taylor, 2013). Children are forever knotted within complexities, insecurities, and the precariousness of the world they inhabit (Nelson et al., 2018; Taylor, 2013). So, I speculate that the role of pedagogy is to become engaged with these complexities.

Taylor (2013) suggests that a shift to enacting common worlding pedagogies is relevant because of "two central ethical challenges facing twenty-first century children" (p. 116). First is the challenge of living ethically with humans and more-than-humans, where relations have become increasingly complex. Second is the challenge of navigating sustainable, livable worlds when so much of the world has been violently and irrevocably changed due to human-centrism. My study acknowledges these two challenges and offers a way in which to attune and respond to them by experimenting with pedagogical possibilities through sound.

1.5.2 Ecological sound art

Gilmurray's (2017) *Ecological Sound Art: Steps Towards a New Field* is one of the seminal pieces on ecological sound art. He situated ecological sound art as a growing movement arising in response to the "critiques and curators [who] often lumped dissimilar artists together, which resulted in a confusion of different sensibilities and tendencies that continues today" (Matilsky, 1992 as cited in Gilmurray, 2017, p. 33).

Furthermore, sound art that addresses ecological precarity seems to lose its importance as

it is overshadowed by the optically loud and large presence of visually curated materials and exhibits. Finally, ecological sound art extends the inclusion of sound art to projects that use sounds to facilitate a discourse on ecological challenges in general, as opposed to acoustic ecologies that deal solely with environmental soundscapes in relation to human production of sound (Gilmurray, 2017).

My research examined ways of being in ECE through sound art. It is important to make the distinction that the theoretical framework did not include acoustic ecology. This study did not concern itself with how children or educators affect environmental soundscapes. Instead, the research worked through the challenges of thinking along with children's relations to the sound places they inhabit, using ecological sound art as a theoretical framework.

1.5.2.1 Sound art as an ecological medium

Ecological sound art and its practitioners acknowledge the significance of developing ecological thought by cultivating a sensorial perception to the surrounding world.

According to Gillmurray (2017),

perception, in this sense, is an attunement or
synchronization between [one's] own rhythms and the
rhythms of things themselves, their own tones and texture
. . . [therefore] becoming sensorially attuned to the world
. . . will result in an embodied understanding of our place
within the earth's biosphere. (p. 37)

The key concept here is perception—more specifically to cultivate a sense of openness to listening and hearing in a manner that leads to sustainable and ethical ways of being with human and nonhuman others by decentring the human from a position of power (Bennett, 2010; Gilmurray, 2017; Morton, 2012).

Second, ecological sound art acknowledges that listening is a deliberate action. Examining this act of listening unveils the dynamics between a listener and their environment. Furthermore, it shows how we position ourselves within the context of our

environment and others. Gilmurray (2017) borrowed from the work of Voegelin (2014), who rejected the Kantian notions of sound existing as an entity. She suggested instead that sounds are neither subjects nor entities; rather, sound is the in-between, the temporal connection between humans, nonhumans, and more-than-humans (Voegelin, 2021). As such, attending to sounds reveals the temporal subjectivity between the listener and the environment.

Third, ecological sound art moves beyond imagining ways of being in the present to imagining future choices and more sustainable worlds, as well as how to sustain these choices (Gilmurray, 2017). Engaging with sonic worlds or sound art irrevocably affects thoughts and perceptions, thereby moving the listener to cocreate and engage in recreating these sensorial ways of being. Ecological sound art imposes on us the desire to rearrange our day-to-day life and assume the responsibility of togetherness because only then is an inclusive and sustainable alternative imagined and lived, one that is not based on the “power of conquest” (Voegelin, 2021, p. 118).

1.5.2.2 Sonic terminology

In this thesis, I draw a distinction between *sound*, sounds, *aural artifacts*, *sonic objects*, and *soundfulness inquiry*. Conceptualizations of the four were derived from a review of interdisciplinary sound scholarship. Sound, sounds, aural artifacts, sonic objects, and soundfulness inquiry are described in the following section.

1.5.2.3 Sound

In the field of material sciences, sound is generally described as a phenomenon that involves the human perception of the oscillation of material particles. The oscillation is activated by friction or pushback from other particles or objects (see Figure 1). The trajectory, speed, and size of the moving particles in each medium characterizes the pitch, tone, and volume of sound as we perceive them.

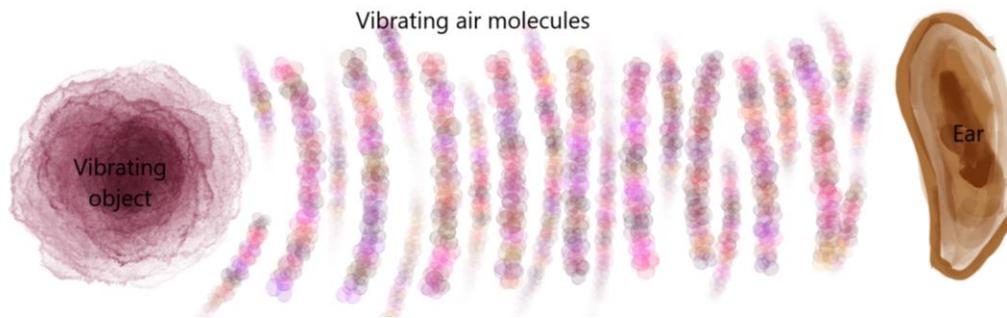


Figure 1. Sound as perceived by human ears.

I prefer Ackerman's (1995) description of sound which is grounded in the act of hearing. Her colourful and elaborate description of what sound does offered the analogy that sound takes routes that mirror a "maniacal miniature golf course" (1995, p. 177). This analogy offered more to the research by opening up the discourse on sounds to encompass questions that asked what sound does rather than just describing what sound is. On the question of what sound is, I acknowledge a conceptualization offered by Bennett (2010) about material waves or their connotation as "vibrant matter" (see Figure 2). However, this acknowledgment required critical recognition at every step of thought and action in the inquiry. As a result of our years of experience in education and pre-service ECE training, we have a vastly different understanding of what sounds are and do.

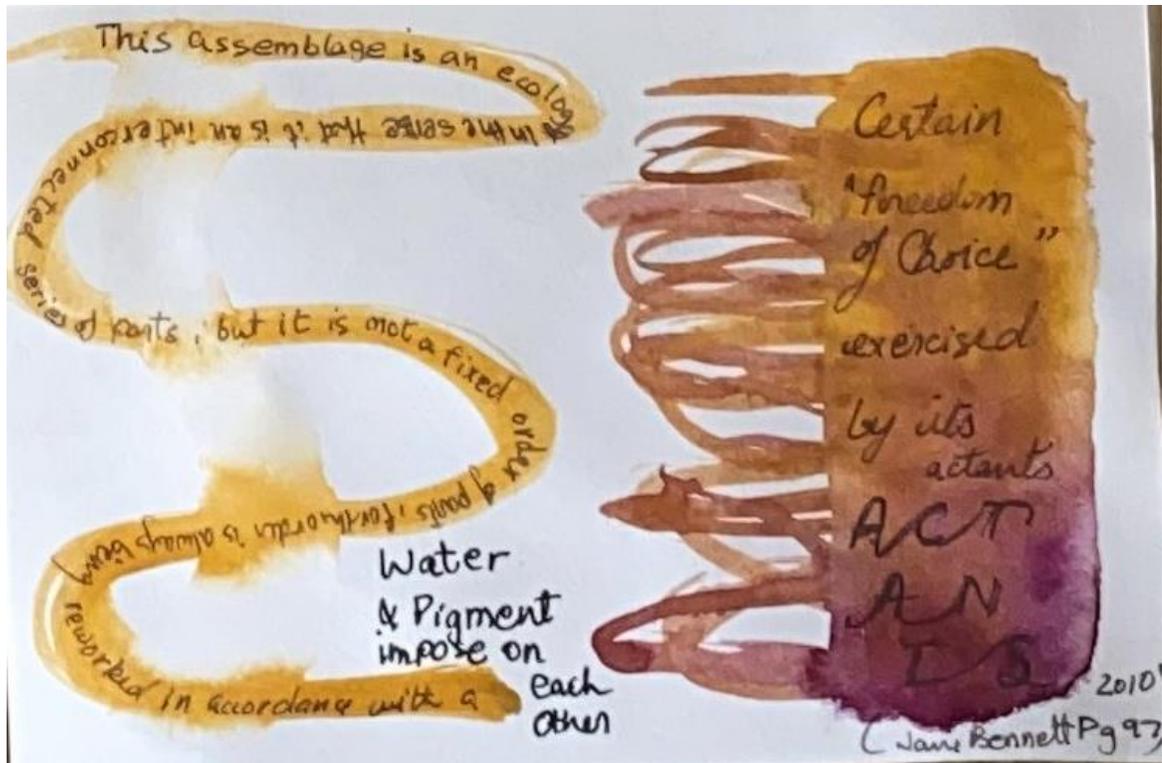


Figure 2. Notes on Bennett (2010, p. 97) in watercolour on paper.

Note. The figure is a photo of my notes in which I think about a quote from Bennett (2010) through artistic engagement and expression with water, pigment, and paper.

In this thesis, specifically in chapters 3 and 4, I write *sound* in the plural form. The use of *sounds* in this thesis is a deliberate act of always thinking with more than one sound. I hope for it to serve as a textual reference to the experience of being immersed within a cacophony of sounds. In this way the writings related to children's and educators' engagements with sounds are anchored within many sonic occurrences rather than a single sound. Use of the word *sounds* also recognizes the leaky nature of material waves in place and the fact that no one sound exists in isolation. Even when we can clearly hear only one sound, it does not mean there are no other sounds (Feth & Durrant, 2014). Using the word *sounds* acknowledges the existence of more than one, or multiplicities (Barad, 2007), in the research (Gallagher et al., 2018). In this thesis I ask the reader to engage with the ideas and propositions in Chapters 3 and 4 premised by sounds.

1.5.2.4 Aural artifacts

The term *aural artifact* in this thesis is coopted from what Anderton (2016) called aural artefacts, referring to recorded sounds played through a computer into one or more speakers. Sounds as aural artifacts are different from the way we normally hear sounds as they occur. The recording equipment that captures aural artifacts records more than the sounds we intended to be captured in that moment, including pops, clicks, or the sudden onrush of wind against the surface of the microphone. The sounds captured unintentionally give the recorded sound clip a particular treatment that muddies the recording and makes its intended subject less than clean; it fails to replicate a single origin of sound. In this thesis, those muddied and unexpected recordings are referred to as aural artifacts. In Chapter 2, I describe the aural artifacts we attuned to as *sound art*.

1.5.2.5 Sonic objects

Sonic object includes the material item from which a particular sound exits. An object is sonic if it has acousmatic properties such as pitch, range, volume, frequency, etc. I have borrowed the term sonic object from a Shafferian trajectory in acousmatic studies. The term originated from the French term *objet sonore* (Steintrager & Chow, 2019). I use it as a label for parts of the sound installation when discussing findings, for the purpose of clarity. In this thesis, the sonic objects are the speakers and subwoofer.

1.5.2.6 Soundfullness inquiry

This thesis engaged with the research questions through a sonically situated methodological approach discussed in Chapter 2. The sound art inquiry that emerged from those methodological conditions in addition to the theoretical frameworks was the soundfullness inquiry. More on this is discussed in Chapter 2 in the section titled Week 1: Pedagogical Orientating.

1.6 Structure of the thesis

This thesis comprises four chapters. Throughout each chapter, images, art, and soundtracks are embedded and considered to hold equal importance to the written words. Chapter 2 begins by describing the methodological approach I used to examine my

findings. I situate and contextualize the research project and describe how the methodological approach affected methods of collecting data. Next, the section titled Methods describes the research project, research site, and co-inquirers. The third section of Chapter 2 describes in depth the data collection methods, of which there were two: pedagogical documentation and methods of attuning to sounds through art. Each subsection describes how engagements with sounds were documented, how sound artifacts were collected, and what they sounded like respectively. The aural artifacts played in the ecological sound art research inquiry are described, and I have provided QR codes to access these soundtracks. I invite readers to listen to these soundtracks as they read this paper. Then I describe the research design considerations from weeks 1, 2, and 3 of the project, which led to the fourth week, called *the intensive*.

Chapter 3 provides a descriptive account of moments from the ecological sound art research inquiry. First, I contextualize children's engagements with sounds. I retrace how the six children physically interacted with the research design at the beginning of the intensive in three subsections: the first focuses on Ophelia, the second on Benny, while the third includes Walt, Kate, Shane, and Maria. In the subsection titled Engagements With Sound in the Latter Half of the Intensive, I retrace changes in children's engagement in the project. Then I interpret four particular moments from children's engagements with sounds. Specifically, these four moments—*cardinal loop*, *drain loop*, *jackhammer interruption*, and *educator as channel*—highlight emergent engagements that were tangential and disrupted habituated ways of being with sounds. Lastly, I thread together the four moments in a section titled A Chorus of the Findings.

Chapter 4 discusses findings and analysis from Chapter 3 and reflects on the questions from Chapters 1 and 2. I come back to the three research questions in the discussion by weaving the questions with theory from the literature review. I then state the significance of this thesis and close with future research possibilities. Final thoughts are illustrated by a waveform image of all the soundscapes and audio tracks, which readers can access by scanning the last QR code.

Chapter 2

2 Methodology

This chapter describes the postqualitative methodological approach within which the research practices and this thesis unfolded. Then I describe the research project, in particular the structure of the research project, the research site, and the co-inquirers. I also describe the data collection methods through which I recorded and interpreted educators' and children's engagements and relations with sounds. Next I contextualize how the soundscapes for engagements with sounds were created. This thesis focuses on findings of engagement with only two pieces of sound art; the sections Sound Art #1 and Sound Art #2 describe the two soundscapes. The next section details the research design considerations from the first three weeks. It is followed by a description of the fourth week, which I call *the intensive*. I close this chapter with ethical implications and a brief chapter summary.

To examine children's sonic worlds and propose other possibilities through sonic capacities, I recognized the need to work beyond the predetermined quantitative or qualitative research designs that have saturated ECE research. Voegelin (2021) argues that engaging with predetermined methods will only recreate the values that have characterized the Anthropocene. I take on this argument and opt for a postqualitative approach which is considered as "a thousand tiny methodologies" (Lather, 2013, p. 635).

2.1 Postqualitative approach

This thesis engages with sounds produced and consumed in ECE and moments that led to rethinking the way we interact with the world around us. To rethink rather than recreate existing material approaches in ECE, I am reminded of Burman's (2016) discussion of binary logics and how they tend to be recreated when research is not innovative or engaged in rethinking the process of meaning making. Furthermore, Burman critiqued the tendency of positivist research to recreate unjust conditions for humans and more-than-humans.

My approach to examine children's relations with sounds employed a postqualitative methodological approach. This approach embraced innovation and indeterminacy to rethink predetermined logics and methods, and proposed refreshed methods and logics to think with. Engaging in relations in a reflexive, diffracted, reciprocal, and generative manner was acknowledged. The approach was appropriate for this study because the principles of both sound ecological art (Gilmurray, 2017; Voegelin, 2021) and common worlding (Taylor, 2013) are interwoven with the theories and philosophies upon which a postqualitative approach is actualized. In other words, the central concern of the theoretical and methodological approaches I used in my study was worlding more ethical common worlds.

The fluidity of a postqualitative approach proposes that the research methods should not be decided at the start of the project. Typically, research using a postqualitative approach may start with a proposed research methodology, but this may change during the study. Other methods may be added on, or the approach may evolve during the postqualitative project. It becomes important to reflect on and record what changes were made and why they were needed. The changes that happened in this research project and its data collection methods are described after the end of this section.

In my inquiry, I borrowed from works of new materialist scholars such as Barad and Lather and recognized that subjectivities may be cocreated, however unstable. Always in vibrant turmoil, perhaps intermittently, these subjectivities are never neatly packaged and are forever in action. They are in action intra-actively, influencing and influenced by agentic actants of an assemblage (Barad, 2007). Therefore, quantifying categories of subjectivities was impractical in my research analysis, as codes create stasis in how subjects are understood. Thus I rejected coding and opted instead to embrace indeterminate fluidity in my research analysis. In this way, the paths I have taken resonate with "a methodology-to-come" (Lather, 2013, p. 635). Embracing indeterminate fluidity necessitated recording to the best of my ability the present and emerging aspects of data and analysis, which often ended with inconclusive concepts characterized by further questions.

The postqualitative approach embraces the idea of situated knowledge (Haraway, 1988) and questions how knowledge is privileged. The methodology pushes the boundaries of research approaches that settle at the conception of reality as a subjective material projection of knowledge (St. Pierre, 2013). As such, in postqualitative research, reality is understood not only as the result of one's knowledge but also as the encounter of the ethics and ontologies with the knowledge (Barad, 2007). This means rethinking what may be assumed as universal.

The notion that language accurately represents reality is troubled in a postqualitative approach. Ingold (2015) acknowledges the limitations of using representational knowledge because it shapes reality in linear and binary terms, often reducing complex realities to oversimplified and controllable variables. Building on previous poststructural arguments about the limitations of representational logic, postqualitative principles critique representational knowledge, suggesting that language is intra-active rather than simply representing an object or subject (Barad, 2007). Barad (2007), for example, asserts, "Intra-action understands agency as not an inherent property of an individual or human to be exercised, but as a dynamism of forces" (p. 141). As such, a postqualitative approach recognizes the performative role of language in the creation of subjectivities as dynamic and ecological. This role necessitates a thoughtful and complexifying approach. Following through with this concept, the subject of postqualitative research is never a single entity or single point of interest; instead, it is the connection between points (Le Grange, 2016). Ecology becomes the focal string in a postqualitative research approach. Likewise, a postqualitative inquiry in ECE rejects human centrism by following children's relations and not children's needs or acquisition of skills (Le Grange, 2018; Taylor, 2013).

Building on postqualitative scholarship, this research inquiry required the researcher to rethink the roles of research data, data analysis, and research methods. In a postqualitative approach, data is not merely collected and recorded. Data is rather understood as deeply implicated in the act of research and has the ability to decenter the researcher; thus, the researcher is not the only agentic entity enacting its will upon the research (Barad, 2007; Lather, 2013; Le Grange, 2018). Data is recognized as agentic and

imbricated/interwoven in the process of data analysis. This requires the researcher to reach beyond conventional qualitative methods rather than engaging with data through categorization and coding.

Finally, a postqualitative approach to research methods is performative and concerned with what might unfold next in the research (Braidotti, 2013; Le Grange, 2017). It is an ongoing process that resists closure. In my study, the methods I employed embodied this sense of movement and forward thinking through sound art. Some of the first tools that became part of the research methodology were related to artistic expression because I recognized the limitations of representational logic in words (St. Pierre, 2013).

2.2 Methods

I engaged with my research in an emergent way to recount movements resulting from research that might have otherwise been seen as tangential and therefore deemed irrelevant in traditional research. I embraced tangents and the outliers from moments of engagements in the inquiry, which might have otherwise been ignored by reductive or prescriptive methodologies. Embracing tangents in the philosophical sense means to deflect from a typical line of thinking to a differently associated line of thought. In this project, one example of embracing tangents unravelled as the co-inquirers and I attuned to noise. Noise, perceived as a disturbance, is typically subjected to control through silencing. However, in this inquiry, considering noise as sounds that may be filled with meaning was an act of embracing tangents. Similar tangential leaps are also evident in my analysis of findings in Chapter 3.

The postqualitative methodology I used embraced tangents by examining change and difference. These nonparallel movements were integral to realizing a nontotalizing truth of matter. To engage in a methodological system that accounts for fluidity, change, and difference in the research design, the research began with pedagogical documentation as a proposed research method. However, the proposed methods shifted through the project and analysis part of the study. Digital art as a method to think with possibilities was added alongside pedagogical documentation. The addition was made because digital art is both a tool and an apparatus. As a tool, it was used in the project to record moments from

the research inquiry. As an apparatus, it created something, and in this act of creation, the subjectivities from the visible–invisible, form–formlessness, and apparent–implied resonated. Thus, digital art as a method attended to the transgressive nature of sounds and children’s engagement with sounds in the project.

In the writing of this thesis, the method of dissemination similarly evolved, from being simply a written representation of what happened, to a multimodal method. The dissemination evolved to incorporate digital art and embedded soundtracks, as seen in Chapters 3 and 4. Below, in the sections Co-inquirers, Data Collection Methods, and Research Design Considerations, I attempt to follow and record why these changes were made.

2.2.1 The research project

Children, educators, and co-researchers were engaged in a sound art inquiry. The first three weeks of the research project (soundfullness inquiry) involved preliminary and preparatory movements at the research site with educators and children. An in-depth discussion of these three weeks can be found in the section titled Research Design Considerations. The fourth week, called the intensive, is further explained in the section titled Research Design—Week 4—Intensive. Initially, the intensive was to last at least half a month. However, the research became bound to a month-long period due to the stay-at-home restrictions imposed during the global COVID-19 pandemic. Below I describe the research site, the co-inquirers, and the data collection methods that led to engagements with sound art.

2.2.2 Research site

The research unfolded and sounded at the site of Dr. Pacini-Ketchabaw’s SSHRC-funded Partnership Development Grant project *Witnessing the Ruins of Progress* (CACN, 2020). The site is an infant classroom in a southwestern Ontario childcare centre. The research site also included the centre’s outdoor play areas and a forested area. Sounds that make up the sonic data were previously collected in these places over the course of a month-long inquiry.

2.2.3 Co-inquirers

Participants in the sound inquiry are referred to as the co-inquirers of the research. In this way, we shifted the language that describes the roles and identities of participants in research to recognize that no child or educator was the subject or object of this research. Such a shift “entail(s) an ethical obligation to intra-act responsibly in the world’s becoming, to contest and rework what matters and what is excluded from mattering” (Barad, 2007, p. 235). Each educator and child was recognized as engaged in the act of research; I accepted Barad’s (2007) assertion that “phenomena do not merely mark the epistemological inseparability of observer and observed; rather, phenomena are the ontological inseparability of agentially intra-acting ‘components’” (pp. 308–309).

The co-inquirers were six consenting children and two consenting early childhood educators. Voluntary participation of children was determined by their legal guardians, who provided informed consent. The children’s ages ranged from 0–2 years. The educators were registered early childhood educators in Ontario with ECE diplomas.

The educators, children, and I collectively influenced and cocreated the research design for engaging with sounds. Educators as co-inquirers collected data as I did through methods outlined in the section called Data Collection Methods. Educators and I co-negotiated the sounds that were played as part of the sound installation. Children’s engagement with the sounds during the inquiry imposed changes to our approach towards the design of the sound inquiry. An example of changes made to the research design is the inclusion of videos corresponding to the sounds, which happened largely due to the children’s and educator’s experiences and feedback. Although the educators and children did not write this thesis, I attempted to co-construct the knowledge produced through this thesis by member checking with the educators throughout the process of writing this thesis. In this way, although educators and children are not co-researchers, they are co-inquirers.

2.3 Data collection methods

2.3.1 Pedagogical documentation

One of the reasons pedagogical documentation was used as a research tool was because it required the researcher to deeply notice the intra-actions and relations between children and others (Pacini-Ketchabaw et al., 2015). This method aligned theoretically and methodologically with the intentions of the project and the thesis.

The inquiry borrowed the idea of engaging in pedagogical documentation from Loris Malaguzzi's notes (Cagliari, 2016). As such, the purpose of documenting was not to simply scrapbook or post the themes or topics of learning with pretty pictures. Instead, pedagogical documentation demanded carefully noting the process children engaged in during the soundfulness inquiry. Furthermore, with pedagogical documentation, I engaged in noticing the environment or place in which pedagogical movements unfolded. It is important to remember that pedagogical documentation aims to complexify what is observed, felt, and related. As such, it is not a process that engages in categorization or coding of what takes place. In the context of this research, pedagogical documentation was not used as a tool to simplify the complexities of early childhood relations. To embrace the convolutions of children's relations and the practice of pedagogy, nontotalizing questions were asked. This meant considering the tensegrity (tension + integrity) of politics, ethics, values, beliefs, places, histories, and knowledge that conceptualized the events recorded as a result of using pedagogical documentation.

To maintain a sense of interconnected complexities, the tools for engaging in pedagogical documentation included those outlined by Pacini-Ketchabaw et al. (2015): "anecdotal observations of children; children's work; photographs that [illustrated] a process in children's learning; audio and video recordings of children engaged in learning; children's voiced ideas" (p. 114). These processes happened collectively with the educators, because they were co-inquirers of the research.

Another reason pedagogical documentation was used was because of its familiarity in ECE practice (Pacini-Ketchabaw et al., 2015). As a tool, it was familiar to the educators who were the co-inquirers.

2.3.2 Methods of attuning to sounds through art

Sound art was used simultaneously and reciprocally with pedagogical documentation methods during the week of the intensive. Sound art is an interdisciplinary art form that involves sounds as a medium to think and make with. Sound art is typically exhibited through installations situated in a particular time and space (Gilmurray, 2017; LaBelle, 2018). In this way, the art emerging through sounds and curated in aural capacities engages with a third dimension in the art space. Most often, a looping structure of sounds is used in sound art. Sound art can be musically constructed; however, there is a subjective fine line when sound art becomes music (Gilmurray, 2017). To stay away from concerns of sound art becoming musical, ecological sound artists tend to stay away from harmonizing or ordering practices, instead focusing on noise and disparate sounds.

Aural artifacts were spliced together to create sound art. Sound art was used intensively and immersively during the intensive of the soundfulness inquiry. We used sounds that had been previously recorded at the research site, as well as sounds we collected outdoors on a daily basis during this week. Whatever was newly recorded was edited into a single soundscape and replayed inside the classroom the next day. The interaction with the soundscapes was observed and pedagogically documented. The aural artifacts curated as sound art were played in the classroom every hour of the day; breaks from listening to the sounds occurred when educators and children left to go outside or have lunch. The sounds that were played every day for five days were never the same.

As part of making sense of what was observed and experienced, creative and academic research practices were combined. Artistic expression that recorded immanent and affective qualities was embraced to balance out the limitations of representational logic in the development of ideas and knowledge in the inquiry. This involved the use of digital technology, such as using an electronic tablet to draw.

2.4 Research design considerations

The conceptualization of the sound inquiry happened collectively with educators and children within a month. In retrospect, the month can be imagined as four stages. In the first three stages, which lasted about three weeks, I made a weekly visit to the site.

During the visits, I connected with the educators and composed research design considerations. These considerations came about through engagement with the educators and children in the classroom and our collective readings of the literature on ecological sounds. This material, as discussed in Chapter 1, exposed educators to conceptual literature and sound art exhibits from the contemporary art world.

During the week of the intensive, children and educators engaged with aural artifacts in an intensive and immersive manner. The intensive was a period of laborious and immersive encounters with sound art. This was the final week of the soundfulness inquiry. I maintained field notes of the educators' reflections and conversations from group discussions through a practice of pedagogical documentation.

In the following sections, I describe how working with sounds during the intensive evolved week by week. The five-day intensive period came to a close with follow-ups with the educators.

2.4.1 Week 1: Pedagogical orientating

The pedagogical movements of the sound inquiry came about through the co-inquirers' common interest in sounds. All movements and decisions to cocreate the sound inquiry were made with a pedagogical orientation and intention. This meant that decisions to move, converse, and engage with sounds were directed by intention. In doing so, the pedagogical work, orientations, interventions, and documentation echoed Vintimilla's (2020) description of pedagogy:

Pedagogy is that which thinks, studies, and orients education: its purposes, its protagonists, its histories, its relations, and processes. . . . [P]edagogy is a body of knowledge (in Europe it is considered a social science). It is active knowledge, one that seeks new bases on which to think in diverse and unfolding conditions. . . . Pedagogy, as a body of knowledge, thinks educational practice; it is reinvigorated by this practice and transforms educational practice. This is why a pedagogue is someone who not only tries to unsettle practice but also tries to find (and sometimes even liberate) the creative force of practice. (para. 5)

To begin engaging with pedagogy in a way that thinks creatively and critically about the ways in which ECE moves with sounds, the educators and I had to come together. Usually, meetings were held in a shared space at the childcare centre known as the atrium. There, we collectively negotiated and cocreated the orientations that would guide the sound inquiry.

Before initiating the research inquiry, educators, other members of the research team, and I met in the atrium and shared pieces from pedagogical documentation that we wished to take up and explore during the intensive week. These pieces were acknowledged as a kind of offering (see Figure 3) which was then to be interpreted and negotiated to cocreate a plan to engage with the questions and issues. Continued conversations with the educators suggested that sound was of interest not only to the adults but also to the children. Collectively, the sounds recalled memories of a place frequented by all in the room. At this stage in the sound inquiry, the educators made suggestions, which we considered during week 2 of the research.

Along with sounds, the educators kept picking up on the concept of power. In conversations, it was curious how much of the conversation was fixed on the issue of exerting a kind of power. This was a consideration I also made when deciding at what volume the sound art should be played back in the classroom. Sounds carry with them the characteristic of decibel control, which determines how loudly or softly the volume is. Attuning to sounds at different decibel levels and allowing them to disrupt everyday activity prompted the question “How can sounds make the happenings of an interaction or action?” We considered how educators could navigate the importance of issues in ECE when certain sounds were muted and others were made louder.

In tandem with power was the concept of softness, as sounds transgressively leak and blur the edges of spaces. In sound art, softness is often achieved through darkness. By erasing the visual form, sound artists create absence or erasure, which allows them to blur boundaries and create a chimeric other. However, the inquiry with sounds during the intensive week resisted this erasure of the visual, because getting a sense of implications

required us to sense from fullness. In other words, we needed information from all the layers in which the acousmatic acts were significant.

We oriented a sense of fullness that came to guide the decisions made throughout the intensive week. The inquiry got its name from this orientation of fullness. It emerged in response to eco-feminists who have proposed moving with the questions of climate change in implicated ways. For example, Shotwell's (2016) propositions on purity came to the surface in this orientation and had a cascading effect on how the aural artifacts were treated before being played as sound art.

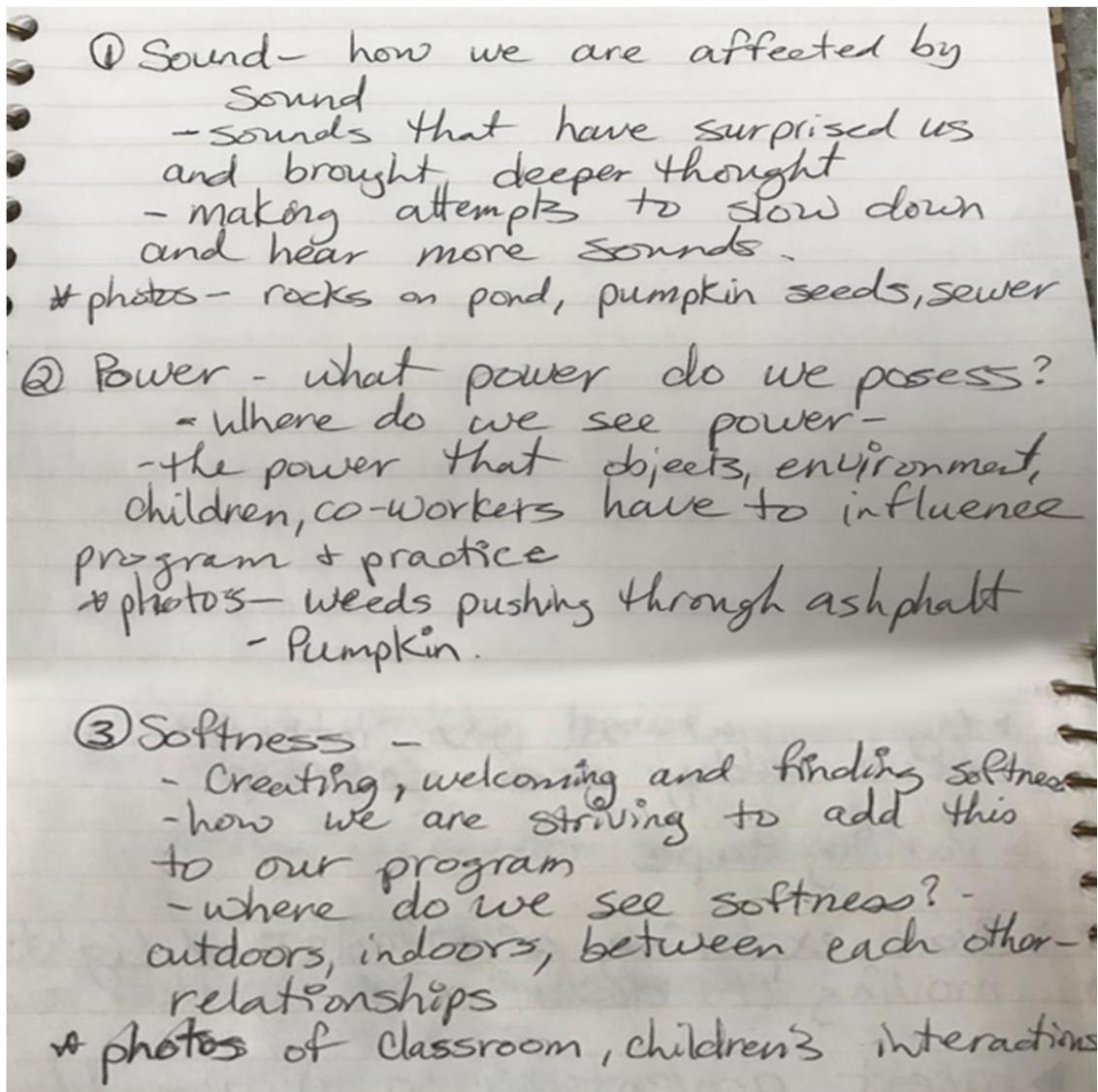


Figure 3. Educators' pedagogical offering.

2.4.2 Week 2: Ideation

During week 2, we *whiled* with the offerings (see **Error! Reference source not found.**). Jardine (2012) says that for something “to be worthy of ‘while’ means not being disconnected and fragmented and distanced, [a] manageable object, but to be lived with” (p. 2). Whiling therefore needed us to slow down from the day-to-day approach normally required of us. We endeavoured to slow down, not so that all activity ceased, but rather so that activity was no longer measured by the clock on the wall. Making momentary interruptions at instinctual clock breaks, we gathered to consider how our work as educators and researchers could take on regulatory roles borrowed from the hustle of market economies. In whiling with children, educators, and others, either in the room or on outdoor walks, conversations and ideation (the formation of ideas or concepts) happened, leading to the soundfulness inquiry in the final intensive week.

Taking up the challenge of understanding the potential of the archived sounds, we wove pedagogical documentation and engagements with collective readings. These posed considerations of how sounds were used, often to entertain children and develop human language. An ongoing tension in the work began to emerge and is described below. This was a tension that educators pushed past by collectively considering and unravelling what sounds do.

In this stage, educators grappled with the tensions between the pedagogical orientation and the challenges of using sounds beyond the ways the literature imposes. To rethink our engagement with sounds in ECE, we decided to attune to sounds that were typically ignored or misheard. These sounds were often unintelligible and unnamed. The idea was to attune to these sounds and the many others that can always be heard along with the sounds that interest us. In this way, the inquiry oriented itself to being immersed in a cacophony of sounds and resisted, by way of silencing, a sense of sanitization. We did this to stay implicated with the multiplicities of subjects in the early childhood assemblage. This orientation was achieved when the recorded sound was not edited out of its contextual soundscape. We ideated this orientation by carefully repeating the sounds, thus making a longer track of sounds that stayed true to a sense of multiplicity. We also programmed, using audio software like Audacity, the sounds that were monophonic to

come simultaneously out of multiple speakers. This allowed us to recreate a multidirectional sense for the intensive week inquiry. To cocreate a fullness in the week-long inquiry, we considered the visual nature of sounds. Our conversations echoed what Kelly and Russolo (2011) describe—that “we usually think of the camera as an eye and the microphone as an ear, but all the senses exist simultaneously in our bodies” (p. 20)—as we ideated how to curate a layered and deep experience using our sound artifacts.

2.4.3 Week 3: The concept

We adopted an approach familiar to the educators and children called *material engagement* to respond to the pedagogical offerings about sounds, power, and softness. The educators had previously immersed themselves in engagements with cardboard and charcoal materials (Bacelar de Castro, 2020). To prepare to engage with and through sounds, my co-researcher and I approached the field of bioacoustics, a cross-disciplinary science examining the production, dispersion, and reception of sounds by animals, including humans. Although bioacoustics is an approach related to the examination of sounds of both human and nonhuman others, it is still problematic. As an approach that attunes to sounds, bioacoustics centralizes singular frequencies of sounds; its methodologies preferentially engage with the isolation of one sound from another. We perceived that the sanitization of sounds from their context was no different from a controlled and exclusionary practice found in quantitative studies. This put bioacoustics at odds with this project and its postqualitative trajectory, which acknowledged tangents, others, and multiplicities. Therefore, we considered another approach to sounds—ecological sound art—which better fit our pedagogical orientation and proposed methodology. Chattopadhyay (2017) writes:

Often, we become absentminded, or experience a trance when listening to certain sounds. These sounds can be as mundane as everyday occurrences—we usually do not attend to them in our daily activities. However, some of these sounds may quite randomly induce us to elevate ourselves to some other perceptual planes perhaps not directly related to the object, source, signification, or site of these sonic occurrences. (para. 7)

Ecological sound art focuses on how sounds entangle with a place's history and epistemologies. To blur distinctions by way of leveraging the leaky nature of sounds, we considered creating disorientating sound relations. In this pairing, an audio track would be paired with objects around the childcare centre, and these objects would be different from what the sounds implied. However, this pairing separated our sounds from their originating physical forms. We ultimately abandoned the intention to explore sounds without an emphasis on their material and object-based visual dimensions (Chattopadhyay, 2014) due to the logistical limitations of this approach.

Music and musical instruments were not a part of the inquiry because music arranges sounds for the pleasure of the human ear. Music is a humancentric notion, one based on ideas of entertainment and self-soothing (Bakker & Martin, 2015; Foran, 2009). Instead of engaging with sounds as predetermined and prescribed in curriculum documents, the inquiry engaged with sounds that surrounded us, moved us, and sometimes agitated us.

The sounds, such as the sonic rocks, the cardinal birdcall, and the storm drain, kept pulling children and educators back to the memory of the place, similar to what Chattopadhyay (2014) describes:

The fluid and mutating nature of that universe of digital objects and their diffusion across the social fabric makes them difficult to authenticate, preserve, or archive in the social memory and knowledge base. The elusive flow of digital objects, carrying a multitude of sound contents, problematizes their (sound's) objecthood, rendering them more as ephemera than even discrete artifacts. (p. 138)

Picking up on this thread from our experiences, we sought to cocreate an immersive sonic environment where children, educators, and researchers listened to the familiar environment of the forest in a place away from it (the classroom) for a week. From this discussion emerged the invitation (see Figure 4).

The starting point was the invitation that informed parents of children who were part of the inquiry about the intensive week. As noted at the bottom of the invitation poster, a

point of inspiration for the inquiry with sounds during the intensive week was Paterson's (2009) participatory installation, where listeners dialed a phone number that allowed them to hear the slow-drip depletion of the Vatnajökull glacier.

Soundfulness

Above: Still from video of pumpkin seed rain on paper.
Below: still from video of storm drain run off.

In the infant room we have been thinking with sounds. With **Educator names** and the children we have noticed certain sounds that provoke our thinking. These sounds stay with us and we revisit them. This week we will be spending more time thinking with the sounds that stay with us. We ask the following questions:

How might we attend to sounds that stay with us?

- How does sound move children?
- How do children attend to sound?
- What relations do they have with sounds?

Sound witness

We envision a process of becoming sound witnesses. A sound witness, a term for attentive, reliable observers of crimes who can inform legal proceedings, becomes instead a witness to realities of precarious climate times.

What does it mean to be an audio witness to ecological sounds?
What can we understand differently when we move past seeing and speaking as dominant ways of witnessing?

We bring the sensorial complexities of attunement to friction ways with sound. In thinking with soundfulness we create audio sequencing of the entangled surround sounds of living in precarious times. What does existence sound like in the name of progress?

Soundfulness is the ethos of engagement in attending to the sounds that stay with us. In curating this ethos, we want to engage with sounds that stay with us and consider these engagements.

To bring a material level of engagement with soundfulness we will participate with fabric connections and embodiments of sound relations. Daily we will engage with audio worlds from outside (pond, forest, playground, neighbourhood) and gather recordings with children bringing these experiences back to the class to engage with.

Above: Sonic rocks video still from pond visit.

As a point of inspiration we begin with Kate Paterson's (2007) *glacier sounds from the deep* done as an audio track with an international phone number anyone could call and listen in real time. Have a listen at <https://www.npr.org/templates/story/story.php?storyId=12317438>

Figure 4. Intensive week orientation and information poster.

2.5 Research design—Week 4—Intensive

During the fourth week of inquiry, we followed up with the design considerations. The invitation in Figure 4 marked the beginning of the week, during which I was on-site for five days, which was four more days than the usual once-a-week visits that took place during weeks 1, 2, and 3. This week was an intensive period and was intended to be a

pedagogical intervention. The week was called *the intensive* because the experience of overhauling and culling toys and materials from everyday practice and the environment in which it unfolds was drastic. There was great discomfort caused by reducing the number of materials in the classroom to only one or two. This is an uncomfortable practice as quality checklists such as ITERS (Harms, Cryer, & Clifford, n.d.) reinforce the concept that for a program to be “high quality,” it must have more than a certain number of items in a classroom. Furthermore, having few things means that if a child shows no interest in what is there, there might not be another item with which they could engage.

The intensive week, therefore, was a disorienting process that interrupted efficiency-based models of quality and brought to the forefront questions that educators must consider engaging in a way that is critically ethical and requires active planning. In doing so, questions were asked about the ethics of living well and what that might mean.

Day 1 of the intensive week began early as Rose and Lynn the educators, along with my co-researcher and me, began setting up speakers to play the aural artifacts. The speakers were a new addition to the room and drew attention due to their physical form. As such, the first half of that day was spent feeling and becoming familiar with the physical form of the subwoofer and speakers. Once it seemed the children had become familiar with the speakers, we began playing sound art #1, featuring sounds of the cardinal, storm drain, pumpkin seed rain, and sonic rocks.

2.5.1 Sound art #1

On the first day of the intensive, four audio tracks were played in a loop. These four sounds came from four video recordings captured at the research site months before the start of the inquiry. The videos had been recorded to capture the sounds of the movements of the children and educators, because relistening to the sounds stimulated questions of memory, affect, and other emergent sensorial ways of being with sounds from the past, present, and possible futures. Filled with such affective consequences, educators and I took up sounds as a member of the research inquiry to think with. Here we extended the same agency to sounds as we did to the educators and children. Sounds

were not an object of the research. Although we recognized sounds as a subject of the research, we also remained open to the possibility of what sounds could be. The subjectivity of sounds remained contingent.

The aural artifact in Figure 5 opens with sounds of water flowing down a storm drain; the second track is the sound of pumpkin seeds falling onto paper; the third sound is rocks hitting a frozen pond, and the last sound is a cardinal's song. The four sounds were stitched together, creating an 18-minute, 46-second-long aural artifact for the soundfulness installation.



Figure 5. QR code access to aural artifact for Day 1.

The sounds in this first soundscape have stayed with and catalyzed ongoing conversations among the educators, children, and researcher. From this point, pedagogical documentation made visible the processes that sound, children, and educators engaged in.

Each day after for the remainder of the intensive week, children were welcomed by aural artifacts in the form of ecological sound art. Educators and children engaged in everyday activity while immersed in waves of the aural artifacts. Each day, we attempted to deeply listen for a few hours until it was time to go outside as a group. When weather permitted, we went to the forested area. When outside, we carried audio and video recorders. Aural artifacts for days 2, 3, 4, and 5 were collected during the time spent outside. The criteria

for selecting which sounds to tune into on subsequent days came about as a collective agreement that echoed orientations, intentions, discussions, questions, and more from the first three weeks of the soundfulness inquiry.

The criteria for selecting sounds to play were: (a) sounds that the group had collectively come up against; (b) sounds that caught inquirers by surprise or provoked pedagogical thinking; (c) sounds that imposed a change of pace in the day-to-day routine and required staying with questions that emerged from listening; and (d) sounds that were already there from routines that we had not yet slowed down. At the end of each day, educators debriefed their own experiences with the sounds from the installation and those of the children. During debriefings, educators considered the selection criteria for sounds with relation to their experiences of the day. We also chose recordings from the day that would be played the following day.

2.5.2 Sound art #2

On the second day, we played sound art #2 (see Figure 6). For this second sound art, sounds were collected by the educators, children, and me from the forested spaces of the research site. In the recorded sounds, the wind was audible. Occasionally in the sound of wind, we heard noise from a nearby schoolyard. There were sounds of birdsong and traffic or a train going by.

I then used Audacity (version 3.0.5), a digital audio software program, to stitch the aforementioned recorded sound clips into a soundscape. The soundscape was offered back to the classroom. The classroom was set up with audio speakers so that the sound could be experienced directionally, intensively, and intimately. Thus, we experienced these sounds in an imbricated manner. We made arrangements to experience the sound and its textures (bass, treble, and noise), ensuring an immersive sensorial experience.

After the first day of engagement with sounds, educators said the sounds from the installation had been disorienting. Upon being questioned further, Rose said the sounds played from sound art #1 had a memorable visual element. Further, Lynn and Rose agreed that “sound and sight were impossible to separate in children’s relations with the

place.” Hearing the familiar sound and not seeing or feeling the associated cues left children and educators feeling uncomfortable. The lack of visual cues also seemed to interrupt the intentions of the inquiry, as conversations among children and educators did not go beyond asking: “What is that sound?”



Figure 6. QR code access to aural artifact for Day 2.

To pursue further and in a contextual manner children’s relations with place through sounds, we decided to continue the surround-sound, multi-speaker set up in the classroom but added corresponding video or visual cues. We agreed that any videos played should encompass minimal movement to avoid habits that, by default, focus attention in “watching-the-show” entertainment ways that cause visuals to dominate audio. In doing so, the educators and I acknowledged that “the senses exist simultaneously in our bodies” (Kelly & Russolo, 2011, p. 20).

2.6 Ethical considerations

The research is embedded in the Climate Action Childhood Network: Exploring Climate Change Pedagogies with Children project (CACN), which has ethical approval from the Western University Non-Medical Research Ethics Board. The existing NMREB file number is 109337.

The research did not present any foreseen risk or harm to the children, educators, and researcher. Breaks from listening to the soundscape (by switching off the sound system) were organized to reduce the chances of desensitization to the sounds. For ethics approval, my study was embedded in the approval acquired for the CACN project. I ensured the necessary safety protocols were followed related to sensitive information about the children and educators. This included maintaining anonymity and confidentiality of the personal information of the children and educators.

2.7 Chapter summary

This chapter described how a postqualitative methodology was used to resist prescribed conceptualizations of sounds in early childhood education. The research project in which I had analyzed the existing data was described. Then I explained the site where the research unfolded over the course of a month. I detailed how the last week of the inquiry was an intensive week in which the children, educators, and I engaged with methods of pedagogical documentation and sound art to attune to emergent and sporadic moments with sounds.

In the next chapter, I share the findings that emerged from the soundfulness inquiry. Specifically, Chapter 3 describes moments from engagements with sound art #1 and sound art #2, followed by an analysis of the findings.

Chapter 3

3 Findings

In this chapter, I present data that emerged from the five days of intensive inquiry with sounds (called the soundfullness inquiry) through a descriptive recounting of events. The anecdotes that illustrate moments from the inquiry are italicized. They are vignettes developed from field notes, interpretations, drawings, sound art, and images from the intensive. While Chapters 1 and 2 engaged my first two research questions simultaneously (i.e., *How is sound consumed and produced in ECE?* and *What other ways of being might we enact through sounds and ecological sound art in ECE?*), this chapter discusses my third research question (i.e., *How might sound become an agentic entity through pedagogical documentation and digital technology?*).

This thesis is both embedded in and has emerged through postqualitative methods; as such, the beginning and ending stages between methods in Chapter 2 and the inquiry as noted in this chapter overlap. The sound inquiry lasted a month. In the first three weeks, educators, children, and I cocreated a methodological approach and research design, which is described in Chapter 2. In this chapter, I examine the engagements from week 4, which was called the intensive. I begin by broadly describing children's engagements with the sound art. Then, through anecdotes from the intensive, I highlight moments that were tangential to the ideas I found in the literature, describing what happened in them and my interpretation of those moments. Importantly, this chapter includes digital illustrations and anecdotes, which were part of the pedagogical documentation that emerged from moments and debriefings of those moments during the intensive week.

3.1 Children's engagement with sounds

At the beginning of the intensive week, the educators and I changed the classroom to accommodate the sound art. These changes, which I described previously, involved reducing the number of items in the classroom and making space for the speakers and subwoofer. The children met the changes with excitement and hesitancy. The changes merited exclusive attention due to the physical form of the sound installation: Children

noticed the speakers and subwoofer occupying physical space in their classroom, and these objects were nothing like what the children had witnessed in the classroom before the intensive. The shiny black plastic surfaces of the speakers were striking. They contrasted with the neutral palette of colours and materials in the classroom.

I noted three ways children moved with the sounds and the sound art installations during the intensive. A caution to the reader: I do not posit there exist only three kinds of engagements with sound art. Instead, these are just the ones I was able to notice and follow.

One kind of engagement was children who turned their heads and only attended to the aural aspects of the sound art installation. For example, educators noticed Ophelia taking steps away from the speakers. She then came closer, only to move away from the installation again. Despite her distance, Ophelia was always within sonic reach of the installation. The second type of engagement was when children stayed in proximity to the sound installation's material bodies (sonic objects). They showed interest or excitement in the physical nature of the sonic objects, such as the hard plastic surfaces encasing the speakers. For example, Benny's encounter with the installation was intimate (in proximity) as Benny tumbled, touched, and stayed with the plastic speaker and the sounds it played. Third, some children did not engage with the installation at all until educators guided the engagement. Children such as Walt, Kate, Shane, and Maria did not come closer to the speakers after their initial introduction to the installation. I further describe these three kinds of engagements in the following sections, which detail the children's respective engagements with the sound installation.

3.1.1 Ophelia's encounters with the installation

Ophelia only showed interest in the sounds and not the speakers or subwoofer. She turned her head towards the speaker only when sounds exited it. Ophelia's engagement with the installation was always from afar. Educators noticed that the child seemed hesitant to touch parts of the sound art installation. She consistently maintained a distance from the installation. The educators and I noticed that Ophelia's distance was not a lack of engagement but a differential engagement with the sound art. Ophelia moved and acted

because of the sounds, just not in ways the educators and I had expected. Ophelia shook her head, arms, and feet when sounds played through the installation. Other times she turned her head towards the sounds while walking around the classroom and still maintaining distance from the installation. We considered the reasons for Ophelia's distance. It was a kind of distance characterized by how sounds moved the air pressure in the room and thereby moved the child. Was Ophelia's equilibrium disturbed as her middle ear struggled to find stasis in a room filled with sounds, or was it the loudness that made her inch away? I recognize that sounds are more than an auditory perception of our minds. Sounds are movements of particles—the air in a space transformed by pressures exerted by phenomena of a place (e.g., the forest) into another location (e.g., the classroom). Could distance between Ophelia and the installation have been due to a tension between the material-subjective ontology of the sounds?

3.1.2 Benny encounters the installation

Other children constantly engaged with the physical form of the sonic objects and prepared themselves in anticipation to hear the sounds to come. Benny, for example, was consistently close to the installation.

On their own, Benny traced their fingers over the different speakers as and when it emitted sounds, exclaiming “ooooh” with eyes widened. Then, they babbled and reached out cautiously towards the black subwoofer when it displaced air, which produced low-pitched frequencies commonly referred to as bass (see Figure 7, Approaching the subwoofer). Benny did this multiple times over, and every attempt became bolder than the last. They stopped temporarily to reach out to another speaker when it produced sounds. Unlike Ophelia, Benny would proactively scope the classroom for sounds and sometimes preemptively mimic pieces from the sound art. Benny's and Ophelia's actions showcase two characteristics of encountering sounds. One characteristic is defined by the physical distance between the listener and the sonic object. The second characteristic is the preemptive or reactive manner of engaging with sounds. These characteristics were the context in which children's engagement with sounds unfolded.



Figure 7. Approaching the subwoofer.

3.1.3 Walt's, Kate's, Shane's, and Maria's encounters with the installation

Although Benny and Ophelia engaged with sounds without any encouragement from the educators, other children only acknowledged the sounds when educators encouraged them to do so. For instance, Walt, Kate, Shane, and Maria acknowledged the classroom changes only after the educators' prompts. The prompts were questions such as "What is that?" or "Where did that sound come from?" or "What was that sound?"

Kate (see Figure 8) pointed at the visual projections of sounds, and along with Lynn (an educator), mimicked the sounds from the installation. Educators noted during debriefings that they thought these moments provided a good way of incorporating opportunities for children to practice pronouncing sounds.



Figure 8. Kate pointing at the projections of sounds.

3.1.4 Engagements with sound in the latter half of the intensive week

As the days of the inquiry progressed, Walt, Kate, and Shane began engaging with the sounds without always attending to the physical form of the installation. They reacted less and proacted more towards sounds. The shock and awe at the beginning of the intensive week due to the unexpected emergence of sound was absent; instead, the children and educators expected to hear sounds. Towards the end of the intensive week, educators moved through everyday activities fully expecting to hear sounds, going so far as to notice the sounds of their movements with the children, such as changing diapers or

shuffling file folders. These were sounds they had not paid much attention to before the experience of the intensive week.

3.2 Four moments from children's engagement with sounds

The way the educators, children, and I consumed sounds in the soundfulness inquiry was largely concurrent with the literature on how educators in ECE use sounds as music and entertainment, songs of knowledge, phonemic awareness, and developmental markers. Sounds from the intensive week were taken up often as music for children's entertainment. For instance, educators asked, "What is that sound?" or said, "Listen to the sound" when they wanted to keep children entertained. Educators also repeated the sounds from the sound art in a melodious manner. However, engaging with sounds as ecological sound art situated within the common worlding onto-epistemological framework interrupted the problem with sounds in ECE I mentioned earlier. The interruptions happened during small windows of time in which the soundfulness inquiry reconfigured wordless sounds as filled with affective relations and knowledge of a place, instead of dismissing these sounds as noise. Viewed through a developmental lens, felt moments with noise-sound would have gone unnoticed before the sound inquiry in the classroom.

The sound inquiry made these moments apparent by the disruptions caused by embracing the emergent sensorial experiences with sounds. The tensions from these meaningful moments remained fleeting as we struggled to stay with sonic possibilities. The following are moments from the inquiry that illustrate other ways of being with sounds. These ways include conceptualizing sounds as transgressive, implicated, and multilayered rather than sanitized and controlled in practice.

In the next four sections, Cardinal Loop, Drain Loop, Jackhammer Interruption, and Educator as Channel, I describe the interruptions made by engaging with sounds within a common worlding onto-epistemological framework. At the end of this chapter, I analyze how these interruptions, despite being momentary, stood out and paused our habituated sensibilities of music and entertainment, songs of knowledge, phonemic awareness, and developmentalism.

3.2.1 Cardinal loop

The sound in Figure 9 is an excerpt from sound art #1 (see Chapter 2). We heard the sounds of a cardinal chirping from varying distances. We also heard the wind, the cars, and unintelligible others fading in and out in the background.

The sound of the bird from cardinal_loop.mp3 breaks the relative silence in the room. The chirping immediately turns heads upwards, stopping us in our tracks. With a searching gaze, all of us look up. Then we all look at each other confused. Ophelia, Benny, Kate, and Walt look at the educators and then back up. Educators and I catch ourselves in the action as we collectively realize the sound of the bird is playing through the installation. It was not a real bird as we instinctively assumed. The room broke into exclamations about how “for a second I thought it was really a bird in here.”



Figure 9. QR code of the `cardinal_loop.mp3`.

In this moment we had looked up, as we would outside, to search for birds perched in trees. The sudden sound of a bird loudly chirping interrupted our movements and instinctively made us look around. We knew there were no trees inside—we could see the white walls of the room. Similarly, there was no cardinal in the room either. Yet, we looked up, seeking the form of a bird perched somewhere above us. We wondered if the way we had responded was truly instinctual or perhaps just a habituated way of listening to sounds when their source is unknown.

The bird sound played for around 4 minutes and 30 seconds each time throughout the day. As we habitually sought the source of sounds inside the classroom, the separation of being indoors versus outdoors broke. The indoors, which educators lamented as giving off an “institutionalized” feeling and I described as a byproduct of modernity, separated children and ECE from the politics of the world, that is, separating the indoors from the cardinal. The emersion of the cardinal loop created invitations for the outside to have a place inside. As a result, the classroom, as a place, became less clean and no longer free from climate politics.

The cardinal loop fabricated feelings of the outside that were made evident by confused responses like the one in the anecdote above. As the educators and I discussed, parts of place felt liminal. This feeling was followed by a reconciliation of catching ourselves reacting in habituated ways. These were momentary and imagined fabrications of the outdoors, interrupted by the realization of being indoors while still having memories and affect related to the cardinal loop from the forest, which led to blurred boundaries between the inside and outside. Educators addressed how this brought another facet into their own thinking about boundaries and how outside sounds made the boundaries ambient or less distinct.

As we listened to cardinal sounds inside, boundaries of the place we called indoors became queered by interruptions made by the sound art and the concepts that flowed from listening to the soundscapes from them in out-of-place environments. The sounds jolted us and thus moved our bodies. There was a sense of physicality that was missing from hearing sounds in their place of origin. Nevertheless, by hearing the sounds out of place, we were located somewhere in-between, not close to the forest where the bird originally was but neither inside the white-walled institution of the childcare classroom. As Shaviro (1997) states, “You can’t quite map out this space, you can’t locate yourself precisely, and you can’t even distinguish one object from another. . . . The sound cradles and embraces you, inviting—even demanding—a sensuous, tactile response” (as cited in Kelly & Russolo, 2011, p. 122). In similar ways, we experienced disorientation and recalled memories from particular places, which created experiences of in-betweenness in place.

3.2.2 Drain loop

The sound in Figure 10 is another excerpt from sound art #1 (see Chapter 2). The sounds from this looped audio track are those of water on the ground falling into a deep drain. The sound of wind erratically contaminates the sound of draining water as it came up against the recording device's microphone at the time of the recording.

The children reach out to the stereo speaker that is across from the subwoofer. Then two children hear water draining into a chasm. As the sounds from the recording in Figure 10 play, we feel the vibrations on our skin. The subwoofer moves air around it, creating pressure that replicates low-pitched frequencies from the sonic artifacts called drain_loop.mp3. The children reach out once again, this time to the source of the low-pitched frequency vibrations called bass, and flinch when fingers encounter the vibrating drum of the subwoofer. Sounds are not only heard but are also felt through the act of reaching out and barely touching the subwoofer. Fingers bounce to the bass in the sounds. Just like the sound of the cardinal in the cardinal_loop.mp3, the water dripping down the storm drain is not an event happening in the classroom. There is no storm drain or runoff water in the classroom as we listen to the drain_loop.mp3. However, ears, fingers, and bodies inch towards the corners of the classroom looking for drains, and the movements stay with the originating event that led to drain_loop.mp3. The atmospheric pressure from sounds touches us, and we become corporeally entangled with the memory of drain_loop.mp3. Thus, the children come into relations with sounds beyond their auditory ranges.



Figure 10. QR code of drain_loop.mp3.

Judging from the children's responses, it seems that the sensation of a speaker drum vibrating is interesting and unusual. Sounds usually do not shake us; instead, sounds creep up and through a sudden drop or increase in decibels, jolting us into surprise. In drain loop, the bass tickled Benny's skin in movements parallel to the sounds from the water running off into the drain. This moment with sound, child, educator, and researcher compelled us to consider that sounds are not simply a perception of human minds. We considered the tactility of seemingly invisible or formless sounds. They interrupt preconceptions of sounds as a thing of cognition realized only through developmental or psychological conditions. By bringing to the forefront the otherwise ignored mechanical nature of sounds that are always intra-acting (Barad, 2007) with others, we understood that sound was not a thing surveyed from a proverbial mission control. We were rather in the thick of it with sounds, journeying together through invisible yet felt sonic spaces. Educators recognized that sounds inhabit a physical space and extend themselves. Hearing the sounds of drain loop did more than sounding out a moment. As Voegelin (2021) suggests, "It builds a sonic timespace environment, made from the invisible relationships of visual objects that have lost their name and purpose in the eventness of sonic materiality" (p. 99).

These spaces were not inert; they propagated transgressively, as noted in cardinal loop. Listening in the sonic space during the intensive week implicated other senses, such as vision and touch. More importantly, it paused the idealization of sounds as a tool to control or master for children's development. From pausing, a space emerged for

educators to consider sounds as agents within the classroom. Intermittently, educators considered “What do sounds do?” as opposed to “What can we do about this sound?” The change in questioning reflects the beginning of understanding sounds as more than a thing we can control, moving us toward understanding that “pursuing this assemblage-ecological sense of sound is how powerfully and pervasively sound acts *on* the human rather than merely being modulated by the human” (Born, 2019, p. 187).

3.2.3 Jackhammer interruption

In this section, I narrate a sonic moment called jackhammer interruption that interfered with our engagement with sound art. I describe how we took up this interruption as a sound worth listening to and not noise that needed to be controlled and reduced. Then I follow conversations and discussions with educators during and after this sonic moment that led to recognizing sounds as always more than a single sonic occurrence. These moments were interruptions that paused habituated engagements with sound in ECE.

Just before the jackhammer interrupts our engagement with sound art, we are sitting on the floor in the classroom (see Figure 11). I am sketching the sounds from this moment on my tablet (see Figure 12). I mark yellow-green clouds as sounds of children’s engagements. Shane is twisting, pulling, and throwing pieces of linen across the room. Maria finds the edge of a piece of tape holding the speakers’ wires down to the floor. Other children are affixed to the projection which is noted by the multicoloured square in the far-left edge of the room. There are conversations among educators noted by the red lines running across the illustration. Concentric grey circles at the bottom of the drawing denote the sounds of the sound art. The dark blue colour to the right marks the sounds of cabinets opening and closing. While playing, conversing, and exploring, we suddenly hear a loud, repetitive banging sound emerging from outside the room, which I mark as overlapping jagged-edged red shapes (see Figure 12). Benny reaches out to the subwoofer, getting startled as soon as another boom from the jackhammer making impact is heard. Maria, Kate, and Shane look disturbed. Their eyes become wide and their mouths open, but it is not long before eyes squint and mouths close into frowns. Maria continues to pull at the tape holding

down the wires of the installation. Shane, who was playing with squares of linen, now has the cloth balled up and is squeezing it with his palms. The educators drop what they were doing, look outside a circle-shaped window towards the early childhood centre's atrium, and visually confirm a construction worker using what seems like a jackhammer just outside the sunroof.



Figure 11. Cloth material engagements with sounds.

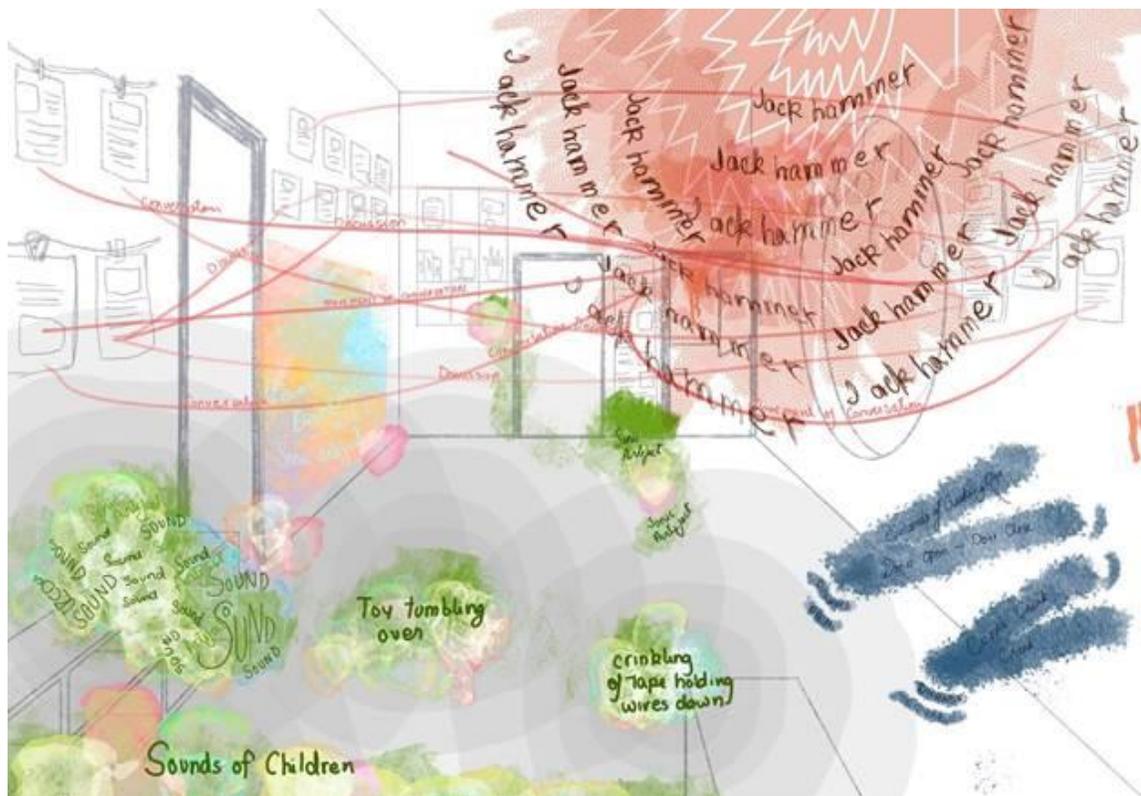


Figure 12. Mapping of all sounds in the classroom.

Rather than calling the jackhammer sounds noise, educators instead took on this moment and wondered how this sound reminded us of the pervading construction work surrounding the centre. Surprisingly, educators did not comment on how the jackhammer was interrupting children's engagement with the sound art. They asked questions from the sound art invitation (see **Error! Reference source not found.**) about the jackhammer sounds. More specifically, they asked the third question, which wonders what children's relations are with the sounds that surround them.

To begin examining children's relations with the sounds around them, the educators realized they had to first recognize and consider those sounds. However, unlike the colourful markings seen in Figure 12, the educators described only two kinds of sounds: the jackhammer and the sound art sounds. Educators noted that the jackhammer sounds invaded and overlapped with the sounds of the sound art. Figure 13 presents my interpretation of the two sounds educators named and described.



Figure 13. Digital documentation of jackhammer and sound art sound.

During debriefings, educators described the moment in the jackhammer vignette as overwhelming. Overwhelming, when used as an adjective to describe an experience, might suggest many parts, some of which may be indescribable. The rendition of two sounds (see Figure 13) hardly seems overwhelming when compared to Figure 12. I ask then, *How do we begin to see the markings of an overwhelming event?* One consideration comes from attempting to recognize the indescribable parts. Another comes from the loudness of sound. Loudness lends a sense of visibility to sounds, making them obvious. Loudness also masks smaller sounds that resonate at lower volumes, thereby reducing perception of the many sounds already present, and in this case, rendering them indescribable.

As educators considered in our discussions how the jackhammer sounds were loud and that there were many other smaller sounds around, they began to name the smaller sounds. In debriefing, we visualized the jackhammer event as filled with other sounds or sonic occurrences. It showcased the sounds from conversations between educator-educator, children-children, children-educators, and sounds-children: the sound of doors opening and closing; the sounds of sonic artifacts from the installation; the sounds of toys tumbling over as children engaged with them; the sound of a piece of tape that secured the speaker wires coming undone, and so many other sounds. Naming these sounds began to disturb the idealization of a singular sound. More specifically, educators recognized sounds beyond the children's verbal occurrences. Educator Rose wondered about what lingering with sounds could offer to curriculum making. In such ways, although momentarily, educators began to consider the others that were a part of the ECE spaces. This question remained until the end of the intensive week. These were welcomed moments that interrupted habituated ways of attuning to sounds in ECE. They allowed critical reflection and recognition of the entropy of sounds as not contained within the confines of the classroom walls. Recognizing the ebb, leak, and flow of sounds began to blur the binary boundaries between one sound and another.

3.2.4 Educator as channel

Midway through the intensive week, in a debriefing at the atrium, educators discussed how their role is often a source of interest or motivation for the children when it comes to

staying with something. This was certainly true for the soundfulness inquiry. As described previously, educators often facilitated or mediated children's encounters with sounds.

The children who seemed to stay with moments from inquiries only when educators embraced the offerings did not care what the inquiry offered if educators ignored the propositions and impositions made by the inquiry. If an educator continued with the day as if it were no different than any other day before the intensive period, then children also seemed to not engage or stay with moments of inquiry. Once the initial shock and awe reaction had passed, educators modelled and impacted children's interest. In response to children's and educators' relationships with sounds, I imagined educators as channels that played sounds of interest. If they were in proximity or exposure to the channels, children would then tune into those sounds. In the world of soundfulness, the teachers were akin to wavelength amplifiers that receive signals that are then strengthened and transmitted to proliferate beyond the wave's point of origin. Therefore, an image of the educator in this assemblage is characterized by the action of channelling sounds to retain children's attunement to staying with sounds that hold possibilities for curriculum.

Figure 14 is a piece of digital documentation from the inquiry created during one of the debriefings. It illustrates that children who listened to the sounds from the installation without the educator more often moved on from the sounds. This was a constant struggle throughout the inquiry. After the conversations in the atrium, educators began noticing the short-lived encounters and increased their engagement with the sounds and children.

Perhaps what is more important to recognize here is not that the educators changed their behaviour. Instead, it is pedagogically significant to recognize educators as critical participants in curriculum making. To be critical participants requires that educators reorient their movements from custodians or simply caregivers to those of an educator. Engagements with sounds offered opportunities for educators to rethink their roles from acting as passive amplifiers to cocreating curricula that thinks of the issues surrounding 21st-century children. The interruptions made by sound art created spaces for educators to

reconsider their roles and think deeply about what is leveraged in early childhood education.

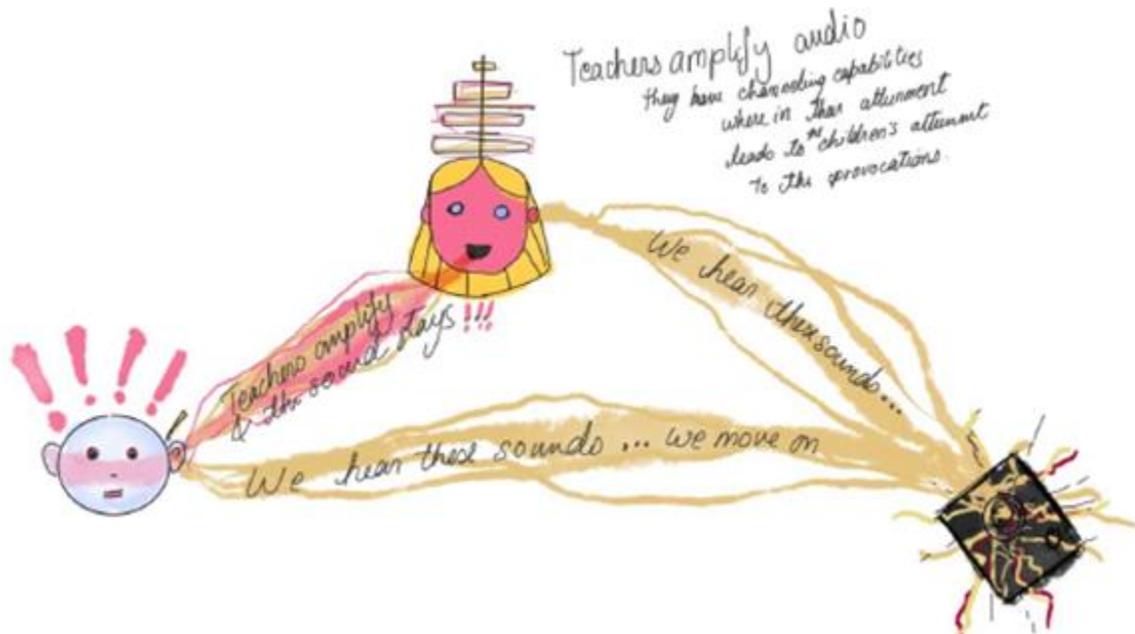


Figure 14. (Left to right) Child, educator, and sonic object from sound installation.

Figure 15 captures a moment from the sound art inquiry and provides a working metaphor for the reimagined educator. In it, the educator is a critical participant who works collectively with other educators and children, attuned to and engaging with the world around them rather than centering on care for one child.



Figure 15. Educators attune to the world with other educators and children.

3.3 A chorus of the findings (Analysis)

The *Oxford English Dictionary* defines a chorus (noun) as “a part of a song that is repeated after each verse, typically by more than one singer”; it is also “a simultaneous

utterance of something by many people” (Oxford University Press, 2021). This section is much like a chorus: It repeats the analysis of my findings and describes other scholars’ utterances that resonate with my findings.

Ecological sound art installations played sounds that were selected through a negotiated process. Engaging with these sounds as a material seemed to shift how we engaged with sounds in the classroom. Through four moments from the soundfulness inquiry, I examined the sonic possibilities, which blurred the boundaries between places.

The cardinal loop anecdote shows that conversations and opportunities for learning that might be tied down by the bounds of a space can be transgressed by sounds. This suggests that sound is another way by which we can situate education and pedagogical work beyond the confines of an institutional classroom. Sounds have a propensity to bring us back to a place and, with immersion, feel it multisensorially.

The drain loop furthers the notion of sounds as vibrant, physical subject-thing-object-events that impose on human actants within the early childhood sound assemblage. The engagements with sound in drain loop resonate with a common worlding approach that recognizes coactants existing in tandem, often decentering the human as the centre of change. The violent physicality of sounds felt through jolts and tickles speaks to how sounds agentially (Barad, 2007) interact in an assemblage.

The moment of the jackhammer interruption reveals the depth of listening to sounds through digital art. Through it, we conceptualized sounds as implicated and multilayered rather than sanitized and controlled in ECE settings. A critical awareness came about regarding the extractive and isolatory nature of our approaches to sounds. Although these moments did not last longer than the consumptive moments with sounds, they proposed multilayered ways of being with sounds. Interruptions made by the sound art became not interruptions but welcomed moments of inventiveness and thinking with children and colleagues about what was collectively important. Always, sounds are dense—not one sound in our day is isolated. Picking up on the idea of denseness, I diffract to LaBelle’s (2020) consideration of how listening helps us to relate to the “depth of others” (p. 7).

The model of educator as channel extends how staying with sounds beyond extractive and consumptive modes might be possible. It offers an opportunity to rethink a role for the educator that reaches far beyond a custodial care provider within the service industry.

The cardinal loop, drain loop, and jackhammer interruption all have in common that these moments did not last long. These four moments were tangential from the educators' and children's everyday movements.

3.4 Summary

In this chapter, I described moments that emerged during an intensive engagement with sounds during a soundfullness inquiry that lasted for a week. The inquiry was grounded in ecological sound art and common worlding theoretical frameworks. This chapter invited you to engage with the findings in sonic ways using QR codes to access the audio tracks that are as much a part of the data as the rest of the findings.

The findings described children's physical engagements with the sound installation and visualized four meaningful moments from the intensive in the fourth week: the cardinal loop, which showcased sound as transgressive and multisensorial; the drain loop, which proposed sounds beyond a modulation of humans; jackhammer interruptions that disrupted our thinking about sounds as a single sound in an otherwise silent space; and the notion of educators as channels, which interrupted the concept of educators as custodial caregivers and proposed they play a critical role as curriculum makers.

In Chapter 4, I return to the research questions guiding this thesis, suggest the significance of the findings, propose further research, and conclude with final thoughts.

Chapter 4

4 Conclusion

Sounds are always present, even in a seemingly quiet early childhood classroom; sounds from within and beyond the room dance around the audible range of human ears. Yet sounds in ECE are embedded in sanitized discourses. In ECE, we do not yet engage with sounds to think of what sounds indicate or tell us about the history of a place or our relationship with it. This thesis examined moments from an inquiry that was filled with sounds. The soundfulness inquiry was an alternative way in which educators and children engaged with sounds in ECE. This thesis engaged with ideas that emerged from a month-long sound inquiry. Specifically, the data focused on four moments of the intensive from the inquiry. In the four moments were glimpses of possibilities to engage with sounds differently than ECE already does. This thesis applied a postqualitative methodology and engaged with data through multiple methods in an emergent manner. In this way, I resisted oversimplifying sonic moments. Instead, I recognized the many methods and tools that resisted totalization. These included written pedagogical documentations, diagrams, digital documentations, audio clips of nonhuman sounds, educator discussions, personal journal notes, drawings, and more. We worked with nonhuman sounds to decenter the human from the sounds in the research design stage. The recording devices picked up more than what our ears could hear; such sounds were called sonic artifacts and were a part of the sound art.

I applied alternative ways of engaging with sounds that disrupted existing engagements with sounds in ECE. By reviewing the literature and recounting moments from the soundfulness research inquiry, I examined how early childhood education consumes sounds and proposed other ways to engage with sounds. In Chapter 3, I suggested that sounds are agential within the early childhood sound assemblage.

In this chapter, I return to the research questions stated in Chapter 1 and discuss the findings from the research inquiry. The questions guiding this thesis were: (a) How is sound consumed and produced in ECE? (b) What other ways of being might be enacted

through sounds and ecological sound art in ECE? (c) How might sound become an agentic entity through pedagogical documentation and digital technology?

Following this discussion I describe the significance of the findings and implications of the gaps in sound discourse within the curriculum. The chapter closes with considerations for future research and final thoughts.

4.1 A sound inquiry

Motivated to resist the burgeoning visual artifacts within the field of early childhood education research, this soundfulness inquiry proposed an alternative sensorial reimagining of early childhood assemblages. This study examined children's relations with sounds using an ecological sound art installation and methods of pedagogical documentation. From a postqualitative methodology (Braidotti, 2013; Lather, 2013; Le Grange, 2016; St. Pierre, 2013) emerged an analysis of children's relations with sounds and a proposition to consider sounds beyond controllable variables in children's experiences. This thesis aimed to build a diffractive account of moments from the soundfulness inquiry. In other words, this thesis did not propose a totalizing theory of sound in early childhood education. Rather, the intended goal was to explore possibilities that emerge from engaging with sounds through intermittent methods of research and interpretation. I embedded audio files within the text of this thesis and created digital art to engage postqualitatively with moments from the soundfulness research inquiry with the goal to tune into the implicated and entangled nature of sounds in ECE.

4.1.1 How is sound consumed and produced in ECE?

A review of the literature on engagement with sounds in Chapter 1 showcased that ECE curriculum documents (e.g., OME, 2014a, 2014b, 2016) that guide practice impose the consumption of sounds for the purposes of developing children's ability to produce sounds and for entertainment. Furthermore, research in early childhood curriculum is predominantly rooted in developmental psychology (Burman, 2016); therefore, engagements with sounds focus on developing behaviours. These are the habituated ways of attuning to sounds in ECE, which the soundfulness inquiry occasionally interrupted during the intensive week. Chapter 3 revealed that acts of engaging with sounds are much

more than behavioural opportunities. Sounds through ecological sound art became, as Kelly and Russolo (2011) describe, a multisensorial experience. According to Bennett (2010) and Ackerman (1995), such an act of listening attunes to the liveliness of sounds.

4.1.2 What other ways of being might be enacted through sounds and ecological sound art in ECE?

In Chapter 3, I described four moments from the soundfullness inquiry. These moments were windows into other ways of being with sounds through ecological sound art. Glimpses into what is enacted through ecological sound art were described. These possibilities contrast with how curriculum documents currently compose relations with sounds. Within the four moments, sounds are recognized as place based, multilayered, always more than one, corporeal, and uncontained. Although these moments were short-lived, they represent the potential of using ecological sound art as a method to interrupt preconceptions of what sounds do in ECE.

The soundfullness inquiry produced another way to engage with sounds in ECE. It revealed a layered cacophony of sounds, a multiplicity of sorts. Constructed in collaboration with educators and children, this new way of engaging would shift early childhood education from being a consumer of sounds for only entertainment or linguistic and phonemic development. Instead, sounds could be part of a method that thinks and interrupts impositions made by curriculum documents. Furthermore, the inquiry invited pauses in everyday practice, which interrupted educators' movements. The interruptions provoked educators to think beyond preconceptions of what sounds are created by children to consider what sounds do in ECE. The multiplicity of sounds reimagines the spaces of ECE as implicated within the histories, ethics, and lives of others.

4.1.3 How might sound become an agentic entity through pedagogical documentation and digital technology?

Sound as agentic has been a subject of theorization by interdisciplinary sound artists. However, in an ECE setting, sounds are taken up as tools or variables that can be controlled and learned. In this inquiry, educators interrupted how they would usually

approach sounds by taking up an ecological sound art installation as an approach to resist visual and institutional ways of engaging with curriculum.

The cardinal loop, drain loop, and jackhammer interruption described the sonic possibilities emerging from encounters with ecological sound art. Although these moments were intermittent, each elucidated varying frequencies with which sounds act. In the cardinal loop, sound enacted tension between a place's histories, ethics, and ways of knowing. In the drain loop, sound, as an entity that affects others, is evident and sound is inducted as an entity of sorts within the sound-art-early-childhood assemblage. The jackhammer interruptions repositioned noise from ambient to the foreground, introducing many other sounds through a very particular set of practices. The educator as channel conceptualized the role of educator from custodian to someone always engaged with the act of education, thus reintroducing a particular set of practices. All four moments from the inquiry are "individual events, entities and sets of practices . . . intra-acting with and mutually constituting one another" (Barad, 2007, p. 389).

Although the illustrations from digital technology are performative and reconfigure what is already there, they also hint at the possibilities of sonic events. I propose to think with the layers of sounds from Figure 12 and consider the thickness of the crudely labelled sounds. There was a sense of chaos with which sounds existed in the assemblage. The four moments noted not only the variety of ways in which humans of the sound-art-childhood assemblage consumed and produced sounds but also the ways in which sound intra-actively imposed itself on the other actants. Perceiving sonic moments beyond being human centered and activated led me to create the digital pedagogical documentation in Figure 12, which illustrates vibrancy and animacy between sonic emergences. The layers of transparent hues resting upon one another in the illustration demonstrate how sounds are nebulous. They showcase layered depths of sounds. The effervescent formlessness of sounds evokes parallels with Bennett's (2010) indeterminate vibrancy and Barad's (2007) sporadic figures of entangled genealogies. There is a sense of pressure between the origins of the sounds that creates dense clouds of interactivity between contact points. These dense moments between contact points are like conversations darting around the room. Although the agency of sound has been theorized and conceptualized already

(Kelly & Russolo, 2011; Labelle, 2018; Steintrager & Chow, 2019; Voegelin, 2021), the four moments discussed in this thesis are unique because, through digital documentation of pedagogical movements, co-inquirers were allowed to take up sounds for purposes that went beyond a measure of classroom control or a developmental milestone.

The illustrations in the findings made visible the agency of sounds, which is often unseen or unnoticed. Ironically, the same representational logics make sounds less visible yet bridge them as heard through appearances. Through visual organization, we were able “to see the mechanisms [of sound], its dynamic structure, and the investment of its agency which might as well be dark and forbidding” (Voegelin, 2021, p. 3). However, by engaging in pedagogical documentation through digital art mediums, we did not leave sounds in the dark, and sounds were not forbidding. Rather, visualizing the invisible natures of sounds invited educators and children to reconsider what they had missed, not noticed, or perhaps even taken for granted in their practice.

In this inquiry, sound was attuned to as if it were part of an early childhood assemblage, “an interconnected series of parts . . . not a fixed order of parts . . . being reworked, each asserting a certain ‘Freedom of Choice’ as actants” (Bennett, 2010, p. 97). Sound then was acknowledged, albeit at the end of the inquiry, nonetheless as a coactant within the soundfulness inquiry.

Sounds came with animacy and vibrancy; they bled into one another and were uncontained. Like the subjects of assemblages (Barad, 2007), acknowledging unseen, unintelligible, or unheard sounds as implicated subjects in our everyday movements led to ongoing consciousness about subtleties of interconnected parts of a whole. Sounds, like vibrant matter (Bennett, 2010), were filled with affective qualities and intermittent personalities that moved others, both human and nonhuman, thus resonating as agentic actants (Barad, 2007) within the assemblage of sound and ECE. Sounds, children, cloth, speakers, birds, water, wind, and more were implicated in what unfolded in the classroom. The digital illustration in Figure 12 represents tenuous sounds with educators, children, me, sounds, other sounds, and materials in the soundfulness inquiry overlapping like plumes of smoke.

Processes of common worlding, ecological sound art, and digital technologies acknowledge nonhuman others. If they are used in ECE as we did in the soundfulness inquiry, I propose that ECE will come closer to engaging with sounds as agentic than it would while continuing with prescribed curriculum practices.

4.2 Significance of the findings

This thesis rethought sound in ECE and proposed ways sound has yet to be considered within everyday practice. Furthermore, this thesis examined how attending to sounds through ecological sound art propositions with orientations from common worlding can lead to alternative sensorial reimaginations of ECE and the agents that make up a sound-child-educator assemblage. My thesis considers the sonic agentic within a common worlding framework that aims to explore the ethical question of living well with others in ECE. Chapter 3 responded to the proliferation of visual documentation in ECE and took the less-visible, unheard, and misheard frequencies into consideration. This thesis responds to the limitations posed by representational logics through semantic ways of coming to knowledge that continue to exist (Ingold, 2015) by using sound clips that may be accessed through QR codes. A postqualitative approach that embraced pedagogical documentation and digital technology at the analysis stage offered ways in which the less obvious parts of an ECE assemblage may be attuned to or granted access to for consideration and to think with and interrupt how ECE consumes sounds. Finally, the analysis of moments from the intensive week proposed a significant shift in how ECE currently conceptualizes sounds in ECE. Rather than a concept to be mastered, this research has proposed sounds as agential coactants, which begs the consideration of engaging with ethics of care with sounds and extending the same principles to sounds as we would to our human peers.

4.3 Further research

The movements of the sound inquiry were catalyzed as a response to the increasing visual data from research in ECE. Although the research intended to shift focus from visual towards auditory parts of the data, visuals were used in the methods and analysis.

Recognizing the limitations of representational logics, I wonder then about nonrepresentational methods to engage with the acousmatic in ECE.

Another consideration comes from the design of the ecological sound art installation. The overall project was one month long. The first three weeks of the month involved once-a-week visits to the childcare centre to orient, develop, and finalize the concept for the fourth week of the inquiry. In the fourth week, we broke away from once-a-week visits to intensive daily visits for five days. What would be the possibilities if co-inquirers engaged with sounds for longer than five days in an intensive? Would the engagements be any different? Further research into children's material relations with sounds from everyday practice involving a multidisciplinary sound art project could shed light on these questions.

4.4 Final thoughts

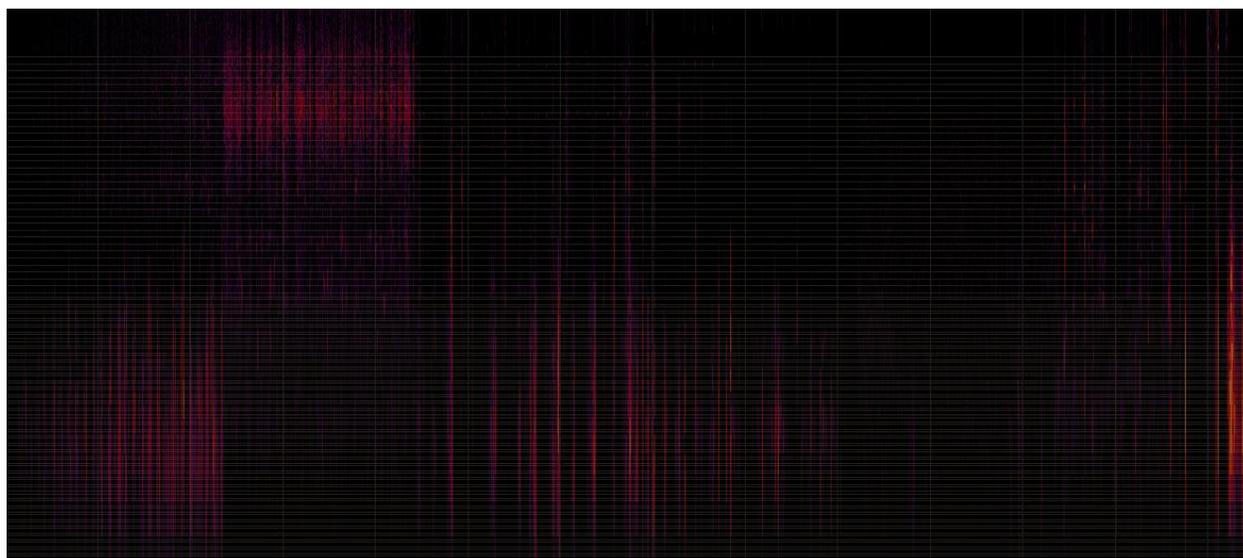


Figure 16. Waveform of sounds from a 26.5-minute audio file.

In keeping with the opening quotation from Gilmurray, I offer the above waveform and the following soundtrack. These are visual and auditory ways to read sounds from a 26.5-minute audio loop of sounds from all five days of the inquiry. It is my hope that listening to these sounds allows them to continue *thinging* through others.



Figure 17. QR code for 26.5-minute audio file.

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Curriculum Vitae

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- Education:** **M.A., Curriculum Studies** - Western University - **Current**
B.A. (Honours), Early Childhood Leadership - Fanshawe College -**2019**
Early Childhood Education Diploma - Fanshawe College - **2017**
Graphic Design Advanced Diploma - Fanshawe College - **2015**
- Teaching Experience:** **B.Ed. Teaching Assistant (ECE II)** - Western University
 Oct 2020 - Current
Program Assistant - London Children's Connection
 Oct 2018 - Feb 2020
Early Childhood Educator (Internship) - Eagle Heights Public School
 2016
Early Childhood Educator (Internship) - University YMCA Childcare
 2016
- Research Experience:** **Research Assistant** - Western University & Early Years Pedagogy Network (ECPN)
 Engaging with Ontario and British Columbia pedagogist working with the ECPN
 Jan 2021 – Current
- Research Assistant**, Climate Action Network - Exploring human-climate relations in early childhood studies (SSHRC Insight funded research project), Veronica Pacini-Ketchabaw, Faculty of Education, Western University
 Responsible for conducting research and collecting research data in a childcare centre with educators, children, and families.
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 Sep 2019 – Jan 2021
- Publications:** Hennessy, S., MacAlpine, K., Bacelar de Castro, A., **Agarwal, M.** et al. (2020) Witnessing Pathways: the troubling, uncomfortable, real, and imagined stories of witnessing the ruins of progress, a pedagogical documentation of collaboratory research work, Children's Museum exhibit Dis/orientating the early childhood sensorium: Micro-stutters for alternative climate futures, London ON, Canada.
- Zakharova, T., and **Agarwal, M.** (in press) Digital Collaboratory. *Children's Geographies* **2021 (forthcoming special issue)**
- Academic Presentations** **Poster Presentation:** "Troubling the logics of sustainable consumerism with a logics of pumpkin"- EnviroCon - Western University, London,

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2020

Paper Presentation: "Soundfulness: Conceptualizing ecological soundscapes as phenomena in early childhood education"- 65th Annual Conference CIES - Seattle, WS, USA

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Symposium Committee Member: "Curriculum and Pedagogy for Uncertain Futures Symposium 2021"- Interdisciplinary Centre for Research in Curriculum as a Social Practice - Western University, London, Canada

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Memberships Pedagogist Network of Ontario,
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Other Relevant Experience: **Program Supervisor** - London Children's Connection
Aug 2019 - Feb 2020

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EarlyON Group Facilitator (Internship) - OEYC Westmount Family Centre
2017