Portfolio of original compositions

by

Timo Sakari Tuhkanen

Submitted in accordance with the requirements for the degree of Doctor of Philosophy

University of Leeds

School of Music

July 2019

The candidate confirms that the work submitted is their own and that appropriate credit has been given where reference has been made to the work of others.

Acknowledgements

I would first and foremost like to thank my son Aldo and my partner Egle Oddo, my parents Pirkko and Martti Tuhkanen, my partners parents Lucia Zanetti and Francesco Paolo Oddo. Secondly I would like to thank my supervisors Martin Iddon and Scott Mc Laughlin for the invaluable help and guidance I received which enabled me to complete this challenging work. I would also like to extend my thanks to Basak Senova who has been instrumental in her curation of my works in various settings enabling my work to be set in a public context, in this regard I would also like to thank Director Enzo Fiammetta and photographer Antti Ahonen. Most of all I want to thank all my family, friends and colleagues whose words and works have directed me in my research immensely. Lastly I would like to give special thanks to the foundations and institutions for their support with funding and residencies and without whom my research and practice would not have been possible: The Paulo Foundation, Oskar Öflunds stiftelse, Frame Contemporary Art Finland, the Arts Promotion Centre Finland, the Nordic Art School, Fondazioni Orestiadi, Dimora Oz, Kunsthalle Exnergasse WUK, Myymälä2 co-op and gallery, Helsinki City Culture and Leisure Division, Finnish Culture Foundation, the Finnish Institute in the Middle East, and the Department Culture and Social Affairs at Ramallah Municipality.

Abstract

In the last few decades the area of touch research has become vibrant, exciting and urgent, yet research into touch in music – in the way outlined here as cutaneous contact – is close to non-existent. Sounds emanate from touch but still, touch has not been included in the aesthetics of music. Examining touch in musical literature I argue that touch is fundamental to music while music's philosophical and aesthetic definition has excluded it. My research reveals that what were previously argued to be the main reasons to marginalize touch in music, are in fact facets of a style of music which has, so far, been marginalized because touch's inclusion problematizes the tangibility of the musical experience. By contrasting my portfolio of original works with my literary review I demonstrate my interrogation of these marginalized facets and show how music changes by moving away from sounding description to tactile demonstration and exploration of sounding shapes, textures and resonating volumes. By including touch in music instruments become tailor-made for individual bodies engaging with and disrupting the technical skill of the musician, the score stops being a singularly imaginable picture and becomes a fragmented assemblage of tangible forms as a musical instance, which I have called the composed musical instrument. Thus, changing musical organization from the written to the assembled composition changes from writing in time to feeling the mapping of topologies and the manipulation of materials through cutaneous contact. Performance of a composition stops being stage oriented and begins at the first sound of making the composed musical instrument.

Most strangely, silence, a key component of music so far, stops being necessary and listening can be done with the skin. Retaining its communicative value as a sound the inclusion of touch creates a semantic sign system that can only be experienced through touch.

Table of Contents

List of Tables

Nothing is as healing as the human touch.[1]

- Bobby Fischer

1 The Observer Chess, 'The End Game of Bobby Fischer', <https://theguardian.com/sport/2008/feb/10/chess.usa> [visited: 23.05.2019]. Reported by Dr. Magnus Skulason as the last words of Chess Grand Master Bobby Fischer.

Introduction

Through the round numbers
and the coloured nerves
the stars are made
and the worlds are sounds.[2]

- Frida Kahlo

Central to my argument about the inclusion of touch into the definition of music is the notion that music is the result of a mixture of two sign systems: sound and touch. The practice I present in this thesis is an exploration of this mixture and aims to reveal and demonstrate how music changes when touch is included in the philosophical definition of what it is.

This research project is the culmination of over ten years of work where my initial intent was to write music that could not be visualized or would not elicit a picture of any kind in the minds of the listener. During this independent practice I became more and more interested in music that would use all the senses in writing and communicating music. I set upon this direction because of two reasons: a strong disillusionment in graphic representations of music, which included an increased awareness of the strong collaborative element in aleatoric and indeterminate composition. This made the visual or seen score feel redundant and thus I started to think of how music could be represented in the other senses. The second reason

2 Frida Kahlo, *The Diary Of Frida Kahlo: And Intimate Self Portrait*, ed. by Phyllis Freeman, trans. by Barbara Crow de Toledo and Ricardo Pohlenz (New York: Harry N. Abrams, 1995), p.210.

was a personal desire to make a music that would not trigger my aural-to-visual synaesthesia, the notion of which arose from the collaborative aspect of my compositions but also a desire to move away from expressing only my perceptual experience and my inner world into a musical realism that felt more tangible and permanent and less ephemeral and transitory. Aesthetically I was searching for a realism in music that would not be literal but which would be able to support the complexity of life and experience. I was initially drawn to verbal scores but, fascinated specifically as I am with material archives and time, I was drawn to objects that would, by their physical presence and when touched and manipulated trigger different memories for different people. Objects are are also interesting because under some circumstances they remain beyond my physical presence.

Working in and around these idea for several years I gradually concluded that not only should the music not give any kind of visual sensation, but that the score itself should be reshaped so that no mental image is needed to understand or play the music. Following the central argument of my thesis, the most likely place for this to occur is to engage in a musical making that is entirely within the sense of touch. This manifold sense, which all life has, and which, out of all the senses, is the only one that can perceive and manipulate the physical world around us in a way that is immediately perceivable by others. My research began with an investigation into the aesthetic understanding of touch in music from discursive point of view, which lead me to consider touch from a historical point of view. During the course of my research I nevertheless felt that such an

investigation was too broad for a thesis and I focused my research away from an aesthetic investigation towards practically figuring out how to make objects that would trigger music and musical memories, or the memory of music, and how to combine those triggered memories with a desire to touch the object where the original musical material would only be accessible to the touch. Touch has a direct physical relationship with musical instruments and its existence can be seen all the fields of music. This relationship is apparent in the performance of a composition but it is also in the sounds of making the musical instrument.

In this thesis I describe the process and the end result of simultaneously composing, making, and playing an instrument. Rather than augmenting, preparing, or changing the instruments in some way to create new or alien instruments and sounds that are in contrast to the existing form, I explore various process starting from the unaltered blocks of musical materials – often wood, metals, paper, and fabrics – from which the process of composing, by means of touch, moves towards, through, and away from, the performance of a visually notated musical work. It is the interplay and mixing between the material sound and the perceptual touch that I am interested in demonstrating. While my research moved away from considering musical aesthetics alone, I have decided to include relevant discursive aesthetic reflections in my commentary because it remained an important way to reflect on my music throughout my process. It remains my interest to develop the aesthetics of touch in the philosophy of music in its entirety at a later date.

Chapter 1

Music from the Perspective of Touch

In my research I found that while there is usually no explicit mention of the word *touch* in music, it is relied upon in all musical areas implicitly in descriptions that tend to focus on sounding results. I will demonstrate this by showing examples where touch can be seen as being implicit and even sometimes explicit. While this is the case, the philosophy of music does not use touch in its definition of music. Throughout my thesis I will give examples of philosophical definitions of music to demonstrate how touch is marginalized by music's philosophical discourse and how it has been excluded from the definition of what music is. That touch is found to exist in several areas of music and is sometimes even explicitly discussed – contrasted with the fact that philosophical discourse of the aesthetic of music does not reflect this knowledge on how touch exists as a fundamental feature – demonstrates that it has been marginalized.

Part of this neglect undoubtably arises from the field of touch research which has several areas that in turn marginalize music and sound. Most often touch research sees music as a strain in the hands, or music is seen from the technological perspective as the study of haptic interfaces and digital instruments. The marginalization of music can be seen in recent discussions about vibrations:

> The vibratory, which is both a musical metaphor, it is also a direct consequence of touch, and it is a mode of communication that we are maybe

> not very good at deciphering, so what would it mean to think and to speak and to communicate in a vibratory medium, rather than in this, what seems now, like a very clumsy medium of language.[3]

It can also be seen in the discussion on sound, like in this rather mysterious sentence by Mark Paterson where he says that unlike vision, and somewhat like touch, sound 'can become a model for proximity, the way it impinges upon the hearer and bypasses the difficulties of vision and the separation of representation', without going on to explain how sound bypasses the separation of representation.

In general the field of touch includes psychophysical methods that look at how stimulation of a sense organ creates sensations; in healthcare touch is used to alleviate trauma; psychology and ethnographic research study gender and cultural differences in touching; marketing uses research to create tools by which desires to touch and feel can be used to sell products; designers and architects look at embodiment and the way objects are touched and lived with; touch in art has a long history and there has even been a proposed definition of touch in art; in museums touch is used as a platform for solving issues of access and ableness; in education touch is fundamental in many ways of learning; and finally there is a large body of research into the phenomenology of touch. The importance of touch is noted by authors like Martin Grunwald who in *Human Haptic Perception* defines touch as the 'sine qua non for thought, action, and consciousness', and by and large, these three topics are of immense interest to musicologists and

3 Studim Generale Rietveld Academie, *On Touching: The Alterity Within, Karen Barad*, online video recording, YouTube, 27 June 2018, <https://www.youtube.com/watch?v=u7LvXswjEBY> [accessed: 10.4.2019]. Jack Halberstam quoted from discussion with Karen Bernanrd.

composers, and yet touch is not included in the philosophical nor aesthetic definitions of music.[4]

These topics are of interest to me as well, but I have focused my research on cutaneous touch, which I think brings together all the problems connected to touch in music. Cutaneous touch is the physical sense of touch that happens on the skin and it is this touch, the physical touch of the skin that can manipulate by feeling alone the instrument that emits sounds, that is absent from musical discourse. From the point of view of touch what is important is to recognize that there are several feelings of touch in each instrument and that all these touches have their own aesthetic feeling and their own sign system, which can be followed and used by the composer when composing music.[5] This is where I argue the music of mixed signals happens, when the composition not only uses all the senses to communicate its meaning, but also enters into the details of the senses and starts to communicate within the individual body of the musician.

Thinking about music from the perspective of touch can be presented as axioms which show how music not only hides its indexing of touch, but positively ignores its potential: Touch is the general outline of the body, the rotational axes of the joints, bones, muscles, and skin, as well as the thirteen singular sensory organs inside the skin, muscles, and tendons, which all have their own qualities and dimensions. It is possible to hear

4 Martin Grunwald, *Human Haptic Perception* (Basel: Birkhäuser, 2008), p.vii.
5 What often matters is attention and communication, as Duchamp said, 'to make things exist by pointing them out'. Emerging from this – as I will show in this thesis – is a music that is repetitive and contemplative, even becoming meditative in the sense that craft is meditative. The music utilizes a limited range of sounds where each sound feels markedly different to the touch when the sounds are compared by their cutaneous feeling and not their sound alone.

touch, it is possible to see touch, but neither are touch: only cutaneous contact is touch. Touch can be heard in how sound changes; a *vibrato* is a touch, as is *tremolando* and *portamento*.

Timbre changes are the result of the duration of a touch. To see touch is to embody or mirror a gesture, neither is touch. These are mental representations of touch. A real touch leaves a mark on the skin or inside its tissue, as a cut leaves a scar. This will not happen by looking, while it is the case that sound waves by their nature move matter, including tissue, which can result in tissue damage. In music, tablature maps out the position of where the hand should be to produce the right sound through visual representation. It uses touch, but it does not tell you what it feels like to touch. Articulation and expression marks describe heard qualities of touch in musical terms, as instructions, or how to achieve a certain sound result through touch. Articulation also indexes how touch physically moves sound.

Volume is related to velocity of action and surface materials. Musical notation is an index of touch by which a musician can relate a sound to the means of its production. Authenticity in touch means the feeling of correctness and satisfaction of being correct and things fitting and making sense. If you play correctly you will feel as the piece should feel and you will recognize this feeling the same way it is possible to recognize that the dovetail joint by which the violin's neck is connected to its body is correct. Performance means are general descriptions about the way in which an instrument is approached, including touch, in order to achieve a work of music. Instrumental experience is a wide definition of living with

instruments as cognitive extensions, ranging from the ambience of an instrument and its aura, to playing it.

Chapter 2

Defining a Body of Knowledge

In this thesis I will talk about bodies because a body is a mixture and encounter of its constituent parts. Music as it is formed through touch is fragmented because it only happens when coming into physical contact with the materials making sounds, thus I think the discussion of music must start from 'substances', the physical materials and physical bodies that make sounds and music.[6] The body of music is also a term that is inclusive of the full range of what is included in the experience of musical instruments. For my argument to be understandable within music rather than as interdisciplinary research between several arts I think it is much better to talk about the body of music. I also feel drawn towards its more encompassing categorization of sound, which I see defining not only how the musicians' bodies are related to their instruments in musical performance, but how these categories can place the instruments themselves in relation to their material production and maintenance, which includes the way an instrument looks, and also the notion of how it is touched and how the composers' guide the touch. To me, the way the composers can mix the body of the instrument with the body and perception of the musician with a result that is heard, felt and seen, is explained – or analogues to – the way the Gothic icon painter uses *razdelka*, the painted and coloured lines of

6 Maurice Merleau-Ponty, *The Visible and the Invisible*, ed. by Claude Lefort, trans. by Alphonso Lingis (Evanston: Northwestern University Press, 1968), p.147.

vestments that are there to create a rhythm for the eye and which through this rhythm lead the painting to

> express a metaphysical schema of the given object, with greater force than its visible are capable of, although they are themselves quite invisible. Once outlined on the icon they represent in the icon painter's conception the sum total of the tasks presented to the contemplating eye, the lines that direct the movements of the eye as it contemplates the icon. These lines are a schema for reconstructing the perceived objects in the consciousness, and if one were to look for the physical bases of these lines, they would be force lines, tension lines, in other words, not folds formed under tension, not – folds, in potential only – those lines along which fold would lie, if they were to begin to fall into folds at all. The lines of the razdelka that are outlined on the additional plane reveal to the consciousness the structural character of these planes. Consequently, without limiting one to a passive contemplation of these planes, they help one to understand the functional relationship of such lines to the whole. This means that they provide the means for noticing with special acuteness that such forshortenings are not subject to the demands of linear perspective.[7]

In my reading the physical shape of the instrument, its outlines, volumes and colours not only take the eye of the viewer to the action of touching the body of the instrument in the right places, but go further and give a rhythm to the hands of the toucher in order to guide them to the sum total of the physical structure that is the written score of music and the singular instance of that music. Throughout this thesis I call the object that combines in a mixture these bodies the composed musical instrument.

The second reason is that in order to critique the notion that touch is an extension of music but rather is an intrinsic part of music that has so far been marginalized, I have constructed my thesis as a narrative where by each composition leaves the body of music and then returns to write – or exscribe – on the surface or skin of its body, to show how its centre changes – but in a way that fits in a satisfactory way for a thesis. In leaving music I

7 Pavel Florensky, *Beyond Vision: Essays on the Perception of Art*, ed. by Nicoletta Misler, trans. by Wendy Salmond (London: Reaktion Books, 2012), p.206.

have found it useful to think of a 'body of sense' as consisting of many different parts.[8] This body appears in many forms, but talking about a body in general Nancy says: 'The body—its truth—[which] will always have been the intervallic space between two senses […] [that] inter-express each other.'[9] Thus my narrative began at the inter-expression or the relation between hearing and touch. In music this inter-expressing can happen between various genres of music, between notations and the sounds they represent, and it is also between instruments and between the materials of the instruments. In order to compose music between bodies I have defined the writing of music which inter-expresses between sound and touch as writing that

> indicates the very thing that swerves from signification and which, therefore, is exscribed. Exscription is produced in the loosening of unsignifying spacing: it detaches words from their senses, always again and again, abandoning them to their extension. A word, so long as it's not absorbed without remainder into a sense, remains essentially extended between other words, stretching to touch them, though not merging with them: and that's language as body.[10]

My argument is that the meaning in music is produced by the loosing and swerving of coming together, engaging and mixing the relation between the bodies of knowledge in sound and touch.

Historically the most definite connection of touch with music comes from Aristotle, who in De Anima relates human action to touch.[11] Aristotle considers action to have two categories, those of praxis and poesis, both

8 Jean-Luc Nancy, *Corpus*, trans. by Richard A. Rand (New York: Fordham University Press, 2008), p.23.
9 Ibid. p.65.
10 Ibid. p.71. The argument that follows is that music is the produced by the loosening and swerving from the two meeting and mixing senses and significations of sound and touch.
11 Aristotle, *De Anima: Books II and III (with passages from Book I)*, trans. by D. W. Hamlyn (Oxford: Clarendon Press, 2002), 423b12.

starting from the prima motor. Praxis is premeditated and moral, and as an action is good in itself. Poesis on the other hand is directed towards the creation or production of an object. For touch, the Aristotelian position between praxis and poesis presents an interesting link to form and function, but also to an ethical discussion about touch.[12] This link to ethics and the morals of touch and music feels further augmented by Aristotle when he says in Problems: 'it is argued that the movement inherent in melody – in the ordering of high and low notes, though not in concords – is "related to human actions"',[13] thereby he implicates a line of thought where touch is inherent to the physical ordering of musical notes. Aristotle also seems to be saying that music is an action rather than a motion and is therefore a praxis and not a poesis. It is precisely these mixtures, swerving and problems that fascinate me, especially when working on communal instruments which demand the coming together of bodies in order to play the music and to bring about the instance of a specific musical work.

12 Mark Paterson, *The Sense of Touch: Haptics, Affects and Technologies* (Oxford: Berg, 2007), p.163–164.
13 Lydia Goehr, *Imaginary Museum of Musical Works* (Oxford: Oxford University Press, 2002), p.127.

Chapter 3

Method

My methodology starts with the musical skills needed to make music when being in the presence of and in touch with the musical materials. For me these materials are the physical objects and the sounds that they emit. Historically the relation between music and skill in music can be seen in Lydia Goehr's discussion of Sextus Empiricus definition of music where she presents us with the definition that music is, according to Sextus, 'a skill "as when we describe those who use flutes"'.[14] Sextus, in Denise Davidson Greaves's translation says, music is that 'science concerned with instrumental experience, as when we name those who use auloi'.[15] This simplified translation is a problem because the third definition Sextus provides for music is an improper way of describing any skilled activity, thus the translation, by using the word skill, doesn't clearly define that Sextus didn't consider music to be just any skilled activity, but instrumental experience, for him, was a science adjacent to music theory. While this shows how touch is marginalized in music's philosophical discussion, it also brings up the question: if it is not merely musical skill that Sextus meant with 'instrumental experience', what exactly did he mean? It also leads to a line of thought whereby making, playing, and living with instruments is a science as rigorous as music theory.

14 Ibid., p.123–24.
15 Sextus Empiricus, *Against The Musicians*, trans. by Denise Davidson Greaves (London: University of Nebraska Press, 1986), p.123.

In my research I have developed five primary methods which best characterize my practice. The first, and the one most relevant to presenting the work in an academic context, is the use of visual and auditory documentation of touch as it physically interacts with objects. Today the use of illustrations, photography, and video to show extended techniques has become a staple method to communicate musical ideas. While it is hard to determine the first instance of this method being used, it can be seen in works such as Pierluigi Billone's *Mani. Giacometti* (2000) and has evolved into an aestheticizing of hands in the music vide style documentation of Helmut Lachenmann's compositions such as *Pression* (1969). This implicitly points towards a notation system where hands are filmed so that both the sound and image of the touch are captured in a visual score that is viewed as a moving image rather than read on paper. This aestheticizing of the hands can be seen taken to further artistic levels by Claudia Molitor in works such as *Zuhanden II* (2019) which shows music happening by, with, on the skin, and out of the hands.[16]

These techniques by which 'vision itself can be tactile' is defined by Laura Marks as 'haptic visuality'.[17] Rather than aestheticize the visual element of touch, the documentary recordings are made of each interaction so that they can be analysed separately in order to discern differences between visual and auditory experiences of seeing touch and the feeling of cutaneous touch. Documentation presented with this thesis on a separate USB pen drive includes audio recordings, video recordings and photographs

16 Claudia Molitor, 'Zuhanden', *Tempo*, 287, 91–93, p.93.
17 Laura U. Marks, *Skin of the Film: Intercultural Cinema, Embodiment, and the Senses* (London: Duke University Press, 2000), p. xi.

from the scenes of making instruments, modifying instruments, writing for instruments, playing instruments, listening to instruments, and talking about the music instruments while play and composing, and what this feels like.

The second method is a notational practice which inter-expresses the composition between the body of senses and the body of touch's senses. This method works by manipulating the symbolic representation within each sense and material affordance by which that signal is understood.[18] In this method I am interested in how musical notation can be dispersed between the senses so as to express one particular parameter of music or signal in one sense, and another in another sense, thereby creating the means to mix signals, representations, and icons. By combining this sensorial approach in notation to the idea of using the affordances and properties of materials, my method becomes a means to guide the reflexes of the mind and the body towards a certain action once the instrument is touched, in other words a *razdelka.* This is in opposition to creating a set of instructions to which the musician responds or reacts with a motion. Generally speaking once an object is touched, a well though out use of affordance as a theory will suggest to the user the correct use of the object. Affordance is informed by behavioural science and is originally an evolutionary term.[19] Today it is used more widely, especially in design.[20] It is argued that this wide use makes the term less useful.[21] I have used it as a concept to design instruments which

18 By material affordance or more specifically working with affordance, I mean the reading humans are able to make of their environment and how it is possible to predict that certain materials and shapes afford certain readings more than others.

19 Andrea Scarantino, 'Affordances Explained', *Proceedings of the 2002 Biennal of The Philosophy of Science*, 70 (2003), p.949–961.

20 Udo Kannengiesser and John S. Hero, 'A Process Framework of Affordances in Design', *Design Issues*, 28 (2012), p.50–62.

21 Martin Oliver, 'The Problem with Affordance', *E-Learning*, 4 (2005), p.402–413

are approachable because they are known through their affordance, in that through their visual, or what could be termed their haptic visuality, they communicate a need for touch at a specific point, and once touched they are easily decipherable and engaging.

More specifically to the philosophy of music, and in my works, such as *Heel*, *Pickhammeraxe* and *Valigia Avvolgente*, I have used this method as a way to understand instrumental technique as a 'perceptual background' and the composed musical instrument as a tool that can 'de-habituate' and disrupt this background.[22] Symbolic representation is on the other hand more conceptual and often arises from convention and memory rather than use or function and thus while braille notation exists and is used by blind musicians there are no real cultural conventions of how music should be represented in touch. This method has been a location of experimentation throughout my thesis.

I have called the third method 'skin-listening' and it emerges from the inter-expression between listening and touch in the discourse of practice-based research. In their book Choreo-Graphic Figures Nikolaus Gansterer, Emma Cocker, and Mariella Greil discuss their 'practices of attention' that 'perform a vital role within [their] artistic research process, creating the germinal conditions for experimental aesthetic enquiry.'[23] These 'preparatory' techniques are aimed at enabling an 'increased alertness, vigilance and receptivity, in turn augmenting (heightening, deepening, widening) and nuancing (sharpening, refining) […] individual and collective

22 Mark Paterson, *The Sense of Touch*, p.21.
23 Nikolaus Gansterer, Emma Cocker, and Mariella Greil *Choreo-Graphic Figures: Deviations from the Line* (Berlin: De Gruyter, 2017), p.134.

sensitivities to the vitality dynamics and affects within […] live explorations.'[24] In my work I have developed these preparatory techniques into a method which I have called 'skin-listening' and it is possible to see a deep resemblance between what is termed live explorations and what I have termed building and making instruments. Skin-listening aims not only at heightening attention but I argue it correlates with hearing.[25] Thinking of it as a type of listening is beneficial in order to understand what it means to think in touch. Skin-listening is a method of attention, which unlike affordance, commands its actions when in touch. Affordance being external while skin-listening is internal. The reason I think skin-listening is important for my practice is because it focuses on listening to a touch that does not move but seeks to understand the inter-expression between touch's body of senses and how far the mind can extend when in contact. The method can also be seen as a systematization of what Merleau-Ponty describes as one person touching their hands together, but unlike Merleau-Ponty, I argue that it is possible to train ones attention so that the touch of both hands can be felt at once rather than have the attention always shuffle from one to another.[26]

Not only do I argue this but I argue that it is possible to simultaneously feel many more touches than just two. While I explicitly demonstrate this method in my composition *Fourteen Times in Touch*, it permeates my work. Understanding the inter-expression between attention

24 Ibid. p.134.
25 In contexts beyond music or art, what I call 'skin-listening' can be found in the work of people like Jeff Sitar. He is a locksmith and eight times Lockmaster's International Safecracking Competition winner specializing in opening combination safes through his touch and the sensitivity of his touch has been tested multiple times.
26 Merleau-Ponty, *The Visible and the Invisible*, p.9.

to touch and attention in touch brings about the possibility to de-habituate touch in at least two ways. The first is mimicry, where familiar instruments are turned unfamiliar by replicating them in other materials. Thus, it is possible to use materials that are not typically used in those instruments to make visual replicas which nevertheless feel and sound different. My *Violino-Piccolo* does this by constructing several different replicas of the ¼ violin. The shape is replicated while the materials, and thus the sound, of each replica is different: cardboard, paper, and solid wood. When looked at and when held, the form and weight of the instrument can feel right, but when played the touch and the sound that emerge are not. This practice aims to 'transform the utilitarian relation we tend to have with them (things) in an unfamiliar encounter, where materials, shapes, temperature, size, weight will enter in a dialogue with you.'[27] Skin-listening is the mixture of touch practices and listening practices. Unlike making and playing instruments, where touch causes sounds that can be listened to, skin-listening approaches music from touch via a sensual approach towards the body. Unlike attention to touch, which speaks of the touches that come from without and which approach the body, attention in touch speaks of the internal sensations that reflect and refract in the interior folds and membranes of the deep skin as touch happens. This alter-listening of the skin disturbs the ways in which musicians normally touch their instruments when playing, forcing them to take in much more detail, to slow down, even to become totally still. This causes a musician to make actions and movements that they would never normally make to produce sounds they have no initial idea how to make and

27 Gansterer et all. p.140.

which might not be heard by anyone. This type of listening not only results in an unfamiliar form of listening but also an unfamiliar form of touching, which can be extended into creating unfamiliar forms of musical instruments that are either completely removed from the typical way an instrument should work practically, or which still utilise the forms of traditional instruments to create other forms of music. In my thesis this is especially seen in *Twang I & II*, *Sonic Independence*, *Pickhammeraxe* and *Valigia Avvolgente*.

The fourth method, which brings me back to the experience of instruments, emerges from the inter-expression between the various material crafts and skills. This method is expressed in the making of instruments and the making of replicas. While there are arguments as to why there can be no replicas of musical compositions because once enough of a music is replicated for it to be recognizable it is no longer a replica but is an instance of those compositions, my work critiques this notion by creating composed musical instruments that are singular, physical and which hold the music as a physical form that can be replicated. In music the idea of the replica is marginalized by calling it a craft, even a crime, rather than a constituent of music, in contemporary art theory the physical replica is a fundamental method to understand a work of tactile art. Caro Verbeek speaks of this when studying the tactile poem Sudan-Paris (1921) by Filip Tommaso Marinetti. She says:

> Strongly convinced of the fact that seeing a visual work of art is of additional value to the art historian studying it, I came to the conclusion that studying a tactile work of art should involve haptic experience.[28]

28 Caro Verbeek, 'Prière De Toucher!', *The Senses And Society*, 7 (2012), p.229.

Other works in art exist that explicitly ask to be physically copied, one example is Andrei Monastyrsky's *Finger – 1977*, which came out of the Moscow Conceptualist movement and the Collective Actions group. In *Finger – 1977* he explicitly asks the work to be replicated by publishing online the documentation of the measuring.[29] I argue that my work critiques this purity by including these senses of building, making the form of music composition inherently relate music to tangibility. In this way the act of making a composed musical instrument can be seen as a process of carving and figuring a sonic identity to an object in a way that can be felt to appear on the skin and reveal the body of hearing and non-visual imagination. Whereas a traditional instrument is created to give maximum freedom within a given timbral set, a composed musical object is more akin to a music box, which holds a certain number of timbres the use of which is perhaps constrained to certain gestures and touches, and quite likely even to various tools.

The fifth method is a conceptual tool I have called oppositioning, that is to take an idea or an object and to think and make what I believe is the opposite of that thing and to move in this manner from one opposition to another in a non-linear fashion. This opposite then provides a maximum

29 Podjachevda, *ИЗМЕРЕНИЯ "ПАЛЬЦА" 1977 года*, online video recording, YouTube, 17 January 2014, <https://youtu.be/Xp861b49BuM> [accessed 23.5.2019]. In the process of working on this thesis I have made two copies of Monastyrsky's *Finger*. Based initially on estimates, after discovering this video showing the artist measuring the object, I used them to construct as close a copy as possible. In 2019 I produced a replica of *Finger – 1977* for an exhibition and in the Autumn of 2019 Andrei Monastyrsky contacted me to ask about the copy and my reasons for making it. During this discussion we talked about his reasons for making the video measuring the artwork and he said by way of analogy that he had made no plan to make such a video but that the circumstances had presented themselves and it felt like the right thing to do with the artwork.

contrast and complementary to that thing, taking me from the inside to the outside and back inside in a gesture akin to needlework. Thus rather than a linear development from idea to idea my work can jump over vast distances because of the way in which I use opposites to construct and map out a path of conceptual development. In the way I use this method the opposite of an object can be an idea and vice versa and it can travel from one sense to another. The idea is to study and understand what is it exactly that the thing is, what is its form, what is its function, what does it elicit, what are its relations, and how it can be organized, and then to imagine what is the furthest thing away from that.

From an aesthetic perspective my research has allowed my work to grasp several things in contemporary society such as the role of touch as a cultural healing force, it has taken me towards the discourse of climate change and plant and forest rights as well as the question of plant action in the philosophical sense, to furniture design where instruments are thought of as inhabiting environments and interrupting and de-habituating everyday relations to that environment. The work connects to ASMR or Autonomous Sensory Meridian Response, which becomes relevant when documentation is viewed and listened to even when the aim of all my compositions has been to reduce or eliminate the use of electronics and electricity from the entire process of making, playing and discussing music. ASMR is a sound induced experience felt on the skin. In media, this experiences is often induced by a combination of a video showing in detail an object being touched while amplifying the recorded sound of the touch. Accidental or

unintended ASMR also exists and usually consists of various crafts or work where the recording exposes the scrubbing, rubbing, and other incidental sounds of the action. In contemporary music this aesthetic can be seen in works like *Memory Properties* (2013) by Darya Zvezdina, where a video shows hands as they slowly rub the bow across the violin in various ways.

A major connection emerging late in the research is the knowledge industry of physical presence and operational tactics in the theatre of war where 'an understanding of borders as lines has given way to a new understanding of frontiers as a series of disconnected and estranged points across a surface'.[30] Thus the border or the skin on which the music is written in touch resembles the points which are accessed from above by the musician's body in a non-linear fashion, questioning if these musical actions can be understood only while in physical contact with the point in question or if they can also be understood without the cutaneous touch.

Thus it can be seen that the questions I have been asking have led me to a path of artistic research which combines theoretical and practical issues in a vast variety of subjects that not only bring me to difficult questions about the role of touch and sound in society but does so using musical composition as the primary vehicle of exploration.

30 Eyal Weizman and Philip Misselwitz, 'Military Operations as Urban Planning', <www.metamute.org/editorial/articles/military-operations-urban-planning> [accessed: 8.5.2019].

Chapter 4

Research Questions and Hypothesis

Research questions in order of their appearance in the process:

1. How does music mean something?
2. What does it mean to touch a score?
3. How can one know that one is touching a musical score?
4. How does one's musical experience change when studying music that is only available via touch?
5. How can touch be used actively as a compositional parameter?
6. How can the interaction between touch and music be made communicable?
7. What does it mean to think in touch?
8. How can touch grasp what it cannot reach?
9. What does touch sound like?

In answering these questions, I hypothesise that:

1. All music is intrinsically related to touch, but this relationship has so far been marginalized by discourse that uses touch, but focuses on a description of sound more-or-less excluding touch in aesthetic writing.
2. Touch as a component in music is simultaneously private and intimate and public and communicative.

Chapter 5

5.1 Compositions

The arm thrust itself through the dry-baked earth
Its fingers moved and reached toward space
And searched like eyes, in far places for
The sight of beauty.
The arm twisted and turned with lightning
Imperativeness as if to reach the point
Of the borders of the day that touch
Each other on the rim of the precision-discipline.
Where is the place of the circles of
the eternities?
Suddenly the arm played music sounds
The world had never heard before…
And yet the world knew the meaning of the sounds
The sounds commanded another weight of the way.
Like a greater light, a living fire
They held the greater day of the alter-age
Through sundry equations of projection-being.[31]

- Sun Ra

The compositions are here organized so as to best reveal three conceptual progressions which focus on various aspects of my research questions. While I initiated my research with my first two research questions, the central ideas for the pieces *Heel*, *Violino-Piccolo*, and *Valigia Avvolgente* were conceived at the start of the research, but in terms of chronology *Heel* was the first, *Valigia Avvolgente* was second to last, and *Violino Piccolo* the last piece I finished. These three form three distinct paths and I felt that in

31 Sun Ra, *The Arm*, from *The Immeasurable Equation: The Collected Poetry and Prose*, ed. by James L. Wolf and Harmunt Geerken (Nordestedt: Waitawhile, 2005), p.72.

order to solve them I needed to create compositions that were stepping stones along the way starting from *Heel*.

Heel is the first piece I wrote, the second was *The Land Singing*, the third was *Twang*, the fourth *Sonic Independence*, the fifth *Pickhammeraxe*. At this point I analysed my compositions using the classification system developed during the research process and noticed that I what was missing was a piece which better focused on the skin. Thus I wrote *Fourteen Times in Touch*. After this I wrote *Valigia Avvolgente* and *Twang II: Seeding Tonality*. The last piece I wrote was *Violino-Piccolo*. All my compositions more or less exhibit traits seen in contemporary music, positing them within the wider discourse in music, finding commonalities as well as differences. The first two pieces, *Heel* and *Violino Piccolo*, use my literary review as sign posts to interrogate and pass through the problems arising from the inclusion of touch in music by moving notation away from the seen paper score into a tactile score in a way that includes the body of the instrument in that score. This focuses them within the discourse of the history of notation and the idea of the score as material. This history includes braille notation for the blind, as well as various ways of depicting and representing touching musical instruments or the body as musical instrument on paper. Examples can be seen in works like Lauren Redhead in *collagemusic* (2019), which uses cut and paste collage techniques to arrange fragments of musical materials written on paper, or Francesco Filidei's *Antinoo* (2000) and Robin Hoffmann's *Œhr* (2006) both of which use vertically read notation that asks the musician, in the case of Filidei the audience and in Hoffmann's case a

soloist, to manipulate the sense organs on their faces, the ears, eyes, nose, and mouth, with their hands. The latter three, *The Land Singing*, *Twang* and *Twang II: Seeding Tonality* and *Sonic Independence*, explore facets in the experience of musical instruments and how music inter-expresses between the performance and the making of the musical bodies including non-human bodies. Here I use my literary review as sign posts towards inclusion of touch. These compositions situate my work specifically within the discourse about audience-performer context and again attend to Filidei's *Antinoo*, but also to works outside of music like Paul Neagu's series of works arising from the *Palpable Art Manifesto*, almost all titled *Tactile Objects* (1969–1972), which were intended to be manipulated by the audience and presented sculptures away from their traditional modes of presentations. Two other strong influences have also been what are called *happenings*, which historically brought art to the everyday. Here I am indebted to artist Paolo Barrile, whose *Amplified Art Manifesto* of 1980 stated that the new artist is an

> artist who expresses himself through the actions, behaviours, participation and works of other artists. The "new" artist conceives a project, he announces it, he "proposes" it explaining to other artists its meaning and aims. If they are tuned in to the new artist's thought and objectives, the other artists act. The "new" work of art – which will be exhibited, criticized and commercialized – is the whole project, consisting of dozens or hundreds of works and/or actions of dozens or hundreds of artists.[32]

32 Paolo Barrile, *Paolo Barrile*, ed. by Adriano Barvella, trans. by Richard Birkby, and others, other texts by Carmelo Strano and others (Milan: Antonio Battaglia Arte Contemporanea, 2005), p.68.

From this perspective, I have also wanted to stop the musicians and the audience 'from forming expectations in relation to music making and from relying on the dominant belief that the project dealt in signifying sounds', and instead I ask the participants to offer themselves to not knowing what happens, to being curious, and finding and exploring their touch in 'a playful, social, experimental event (new frame) rather than a concert (conventional frame)'.[33]

In the third line, from *Fourteen Times In Touch, Pickhammeraxe* and *Valigia Avvolgente*, I show how the inclusion of touch in music expresses musical structure and organization in the sense of touch. These compositions situate my work within the discourse of notating music played on the body such as Vinko Globokar's *Corporel* (1985) and the wider history of body percussion as well as the Pauline Oliveros concept of Deep Listening. My works are also related to what are defined as situational scores by Sandeep Bhagwadi, for example in his *Nexus* (2010), meaning that the score 'delivers time- and context-sensitive score information to the musicians at the moment it becomes relevant.'[34] This also makes the works relevant to the discourse of the tactile score which can be seen in the works and thinking of Thomas Enrique and the 'musical instrument as score'.[35] Other relevant works in this context are AndreRaffo Dewar's *Material Music* (2013), which

33 Nina Sun Eidsheim, *Sensing Sound: Singing & Listening as Vibrational Practice* (London, Duke University Press, 2015), p.105.

34 Sandeep Bhagwati, Marcello Giordano, Joanna Berzowska, Alex Bachmayr, Julian Stein, Joseph Browne, Felix Del Tredici, Deborah Egloff, John Sullivan, Marcelo Wanderley and Isabelle Cossette, 'Musiking the Body Electric: The "Body:Suit:Score" as Polyvalent Score Interface for Situational Scores', *Second International Conference on Technologies for Music Notation and Representation* (2016), p.121.

35 Enrique Tomás, 'Musical Instrument as Score', *Proceedings of the International Conference on Technologies for Music Notation and Representation*, 2016, p.110–120.

uses purely tactile objects as a form of graphic or gestural notation, and works like Bnaya Halperin-Kaddari's *Top-Game* (2019), Alexander Khubeev's *Ghost of Dystopia* (2015) and Elena Rykova's *The Mirror of Galadriel* (2012). In these pieces the composers have constructed new instruments that bear little resemblance to traditional instruments to be in line with and to express the conceptual framework beyond the materials used for the sounds. With this organization I intend to make clearer the details and relations between each composition and my research questions, what the materials of each piece is and how I approached them, why, or what the idea behind each piece is, what the piece is about, and what I did with touch that effected the musical outcome of each piece.

5.2 *Heel*

Heel is a composition for contrabass Paetzold which is played so that all the keys are fingered by the musician and who then uses her heel to cover part of the air hole at the bottom of the instrument. Moving the heel over and around the sound hole the sound that is produced is a soft and quiet timbre rich in overtones. The piece asks the musician to play this single note as a drone for any amount of time. During the rehearsals the musician I worked with asked if she could use electronics to amplify and loop the sound and I agreed that she could do that for performances. An extracted image of the performance can be seen in figure 5.2.1 and the full performance can be viewed from the pen drive. (See *Heel* documentation, [Susanne Frohlich Thomas Noll Heel Nr4.mp4], on the attached pen drive.)

Figure 5.2.1 Susanne Fröhlich and Thomas Knoll performing Heel.

In the composition I interrogate the problem of sounding description by questioning what it means to touch a score and how does the musical experience change when a score can only be studied by touch? The inherent problem of sounding descriptions, in the way composers, musicians, and philosophers of music use them to describe music, is that they often rely on

the underlying presence of touch to indicate and represent the way the body touches the instrument, but the descriptions themselves aim at describing the sound produced rather than what the instrument feels like when touched. An example of this can be seen in the way pressing the fingers is described and how this indicates where to touch and what should happen to the sound as a consequence:

> The glissandi are present in the form of bow position on the cello neck. This positioning is constantly behind the fingers, […] The performer is asked to work through the piece whilst maintaining a bow pressure that is consistently just below the level required to create pitch. The only pitches that the performer should allow to sound are the natural harmonics indicated by the numbers in circles (left hand nodal point) on the string indicated by the numeral. These pitches should be allowed to sound until they collapse, or until the right hand is asked to play ordinario, indicating that the performer should slowly move across all four strings from IV–I, I–IV etc.[36]

In such a way the original question can be reformulated as being how the musical description can move from the seen, written or pictured, and the said, to inhabit only the tactile sense of touch. In other words, what exactly is a sounding description in touch and can the sound of touching be itself the description? Through interrogating these questions I came up with two lines of enquiry, the first is to look at the problem of the sign and referent in touch and explore what happens when touch indicates a sound through many senses instead of one. The second is to merge the sign and the referent so that the description of the sound is itself the touch that produces it. These two lines of enquiry are important throughout my thesis and each is more suitable for different purposes and different instruments. In the case of my *Heel*, where the sound is produced by a combination of breath, fingers, and

36 Daniel Richard Wilson, 'Portfolio of Original Compositions with Written Commentary', (unpublished doctoral thesis, University of Leeds, 2014), p.82.

foot, the first approach seemed better and I started by trying to synthesize a single tactile object, or tactile notation, that would describe all the various parameters of music in touch.

5.2.1 Practice Diary for *Heel*

My composition *Heel* was made in collaboration between myself and musician Susanne Fröhlich. After the composition was completed Susanne brought in Thomas Knoll with whom she re-rehearsed the piece for performance. My initial research during the practice sessions with Susanne were relational rather than material or symbolic, which the final score ends up being. In order to interrogate the problem of the tactile score, or referent, I first wanted to study and understand what happens when the musician touches the instrument, and to establish what are the degrees of freedom into which a tactile score can be inserted for it to be read during playing rather than only studied before a performance, interpreted, and then played from memory.[37] As a general approach to the rehearsals, I did this by keeping observational notes during rehearsals from which I could reflect and ask questions about certain ways of touching the instrument during our time together, i.e. what is possible and what not, and secondly by extensively recording, filming, and photographing our practice sessions to be used for post-analysis, which again would inform the way in which I scored the music into the tactile relationship between the musician and the instrument. I also studied Paetzold repertoire through several ensemble and solo pieces

37 By this I mean that my intention was always to produce a score that is as freely experienced as a visually notated score. Ideally, the tactile score should be touch-readable in the same way a visual score is sight-readable.

Figure 5.2.2 The heel touching the air hole of the Paetzold.

including Luciano Berio's *Gesti* (1966), Mathias Spahlinger's *Nah, Getrennt (*1992), Fausto Romitelli's *Seascape* (1994), Oscar Bianchi's *Crepusculo* (2004), Nicolas Kliwadenko's *UtopX* (2011), Malin Bång's *Split Rudder* (2011), Mithacan Ocal's *Küçük Bir Dehşet Musikisi* (2013–14), Sarah Nemtsov's *IRA* (2013), and Maurizio Azzan's *Concetto di Aura* (2016). Some of these, the pieces by Berio, Romitelli, and especially Nemtsov and Azzan became strong elements in the documentation as they were pieces Susanne knew well and through which she played during our rehearsals.

In order to go beyond documentation and interrogate the tactile relationship between the musician and the instrument, and to answer the questions of how, where, and when to insert the tactile score in the act of learning a piece of music and performing it I began by listening and watching videos of recorder and Paetzold repertoire as well as analysed notation for the recorder and Paetzold and determined what in the notation was immediately translatable from the visual to the tactile. From this I

noticed the similarity of fingering charts with braille writing and I arrived at the idea of using braille to notate the fingering patterns of the recorder. This seemed possible because the recorder is most often played with three fingers per hand leaving each with one finger which does not do anything. A mount for the tactile score could be designed so that the fingering tablature could be touched while playing. Figure 5.2.2 shows my first sketch of the notation before the sticks would be mounted on the recorder with wire so that while six of the eight fingers would be engaged in fingering the music the two free fingers would simultaneously be able to touch the notation.

While this worked conceptually and it fulfils all the criteria outlined in my initial research question for *Heel* and in this way answers them the result in practice was a failure and we never even made it to the point of mounting the score on the instrument. Even when she is a virtuoso on her instrument, Susanne simply did not have the necessary tactile acuity and skills to feel what the score said even when she was putting her full concentration onto the notation.

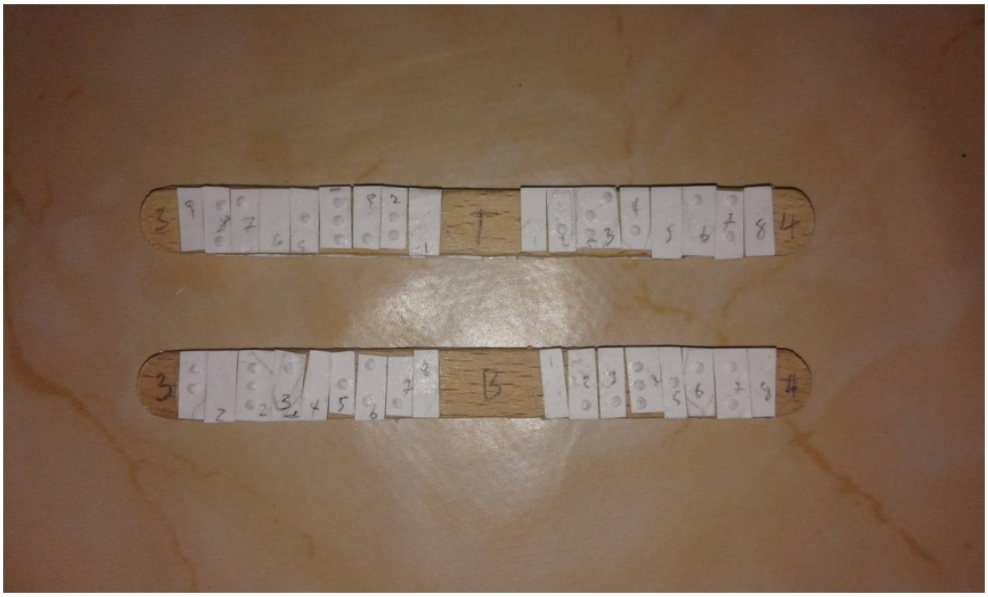

Figure 5.2.3 Tactile score made from braille and sticks.

This failure forced me to reassess the analysis I had been making about the relationship of the musician to their instrument and we went back to exploring how the instrument was touched and how different touches resulted in different sounds when combined with a certain types of blowing techniques.[38] (See *Heel* documentation, [02_Documentation of collaborative process clip_1.mp4], on the attached pen drive.) Using my oppositional method to reassess the relationship between the possible scale of the tactile score and the scale of the instrument I hypothesised that the scale of the score can be too small, as happened, but it can also be too large, thus making the transport of the score from concert to concert impossible, suggesting that there is an optimum size for a tactile score. I will give a critique of the problem of practicality in the discussion on my composition *Twang II: Seeding Tonality* and *Valigia Avvolgente*. In the context of *Heel* it forced me to look closer at the existing relationships and ask if increasing the quantitative amount of touch on the instrument would lead to different results.[39]

Looking at the instrument from this point of view I saw two approaches, the first is to increase the amount of contact surfaces between the musician and the instrument, and the second is to increase the amount of

38 Touch and the fingerings on the recorder are highly complex between two extremes. On the one hand there are multiple fingering possibilities for playing a single tone. On the other hand there are simple fingerings that result in a highly dense multiphonic. Most tones and timbres exist between these two extremes, but it is clear that the complexity of the instrument, where a single tone can have multiple cutaneous feelings present an opportunity as well as a problem for composition that includes touch in its process and aesthetic.

39 In music, like in most fields, touch is most often conceived through a qualitative framework that focuses on the way in which the something is touched. In the context in which I am speaking, quantitative touching refers to the amount of contact between the skin and the instrument, which can be defined in terms of square centimetres. Referring back to the Paetzold, this increase in the quantity of touch can be imagined by visualizing the musician keying all the keys with one arm rather then both hands leaving the other hand to also increase the amount of skin contact with the instrument.

touch by collaboration; two people can touch more than one person, but since my initial hypothesis is that music is intimate, yet communicative, at this point I wanted the solo musician to be able to produce the touches alone, even if they were discovered by collaborative touching. In the rehearsal context this meant that what was normally out of reach for the musician was included by my touch. Thus we discovered that if Susanne fingered all the keys of the Paetzold, and I covered the bottom air hole almost completely the result was a soft sound that was somewhere between a rich timbre and a multiphonic in its complexity, and that this sound could be produced only this way and it worked only when blowing at a certain rate. We quickly saw that a single musician could play the sound using the heel, shown in figure 5.2.3, and that this single sound, which responded and lived with even the slightest move of the heel over the hole, was so complex and interesting that by itself it would be the composition.

The single act of touching the instrument with the heel, while fingering all the keys, recast my initial research question as a problem of how to communicate to the musician, or anyone else, that what they are touching is a score for a specific piece of music. In other words, what makes a particular object feel like a musical score?[40]

Discussing with Susanne these ways of representing the music, we determined that it would not be interesting to simply write the single note Bb, F#, or F, where the sound was the richest and to indicate that the heel should be used to partially close the air hole at the bottom of the instrument.

40 Jerrold Levinson, 'What a Musical Work Is', *The Journal of Philosophy*, 77 (1980), 5–28, p.27.

Susanne said that it was very hard for her to feel exactly what the heel was doing and to control the sound in an absolute sense, so creating a tablature for the heel, while simple in theory, was again not possible in practice. In other words, the heeling was difficult enough that each time we played it the means of producing the music would result in a slightly new variation on the theme.

Thus, I started the second practice phase for *Heel*, determining how to represent and notate the music without resorting to sounding description. During this process I decided to open up the ways in which I could represent the music in practice. That is, in order to answer the problem of the recognizable tactile score, I first needed to understand what it was, exactly, that I wanted to represent if it was not only the sound, and what exactly did the score refer to if not the sound? For this I used the documented materials I had gathered during rehearsals and started using drawings to first dissect what it was that happened when skin touched the instrument, as can be seen in figures 5.2.4 and 5.2.5, which show how I began dividing the body and the sonic sources from each other in a representative drawing. The figure shows the heel, the fingers, the sound source, the air hole, and a representation of the sound as a circular “fence”. As a gesture it asks the musician to move the heel, which is shown as a small “C” shape, over the air hole with a to make a crescent. The fingers are separated from this procedure, as is the sound source that looks like a box or table. The fence around the figures represents rhythmic pulsation of harmonic spectrum where vertical lines are minute movements of the heel and horizontal lines

pitches that are heard. I also listened to the recordings of our practice sessions and discussions for hints that could lead me to solve this problem.

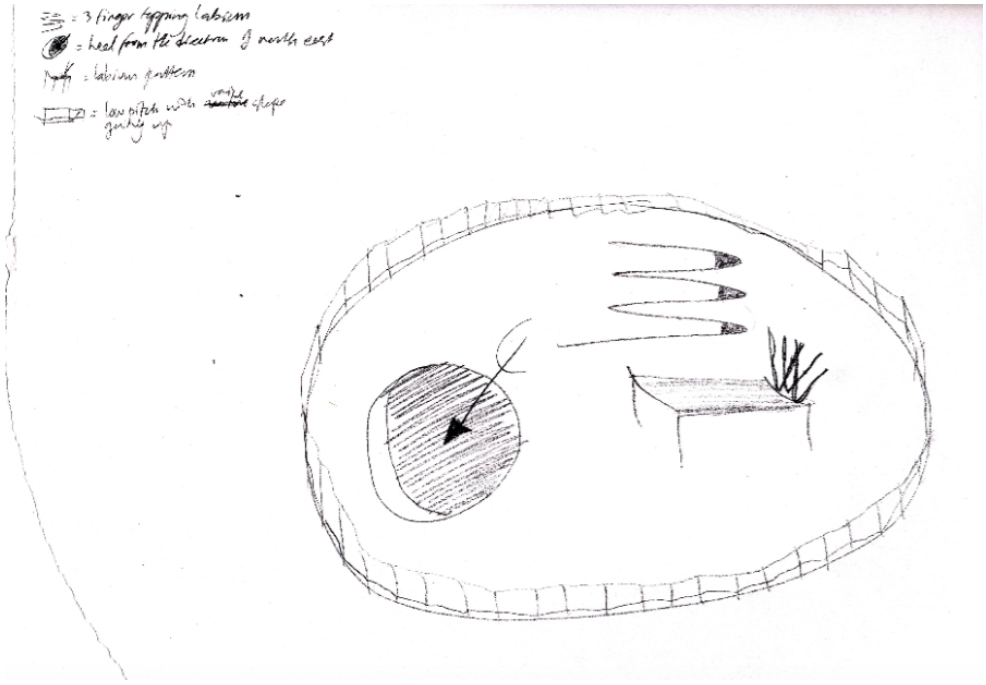

Figure 5.2.4 Representational drawing of heel, fingers, and instrument within a unifying fence.

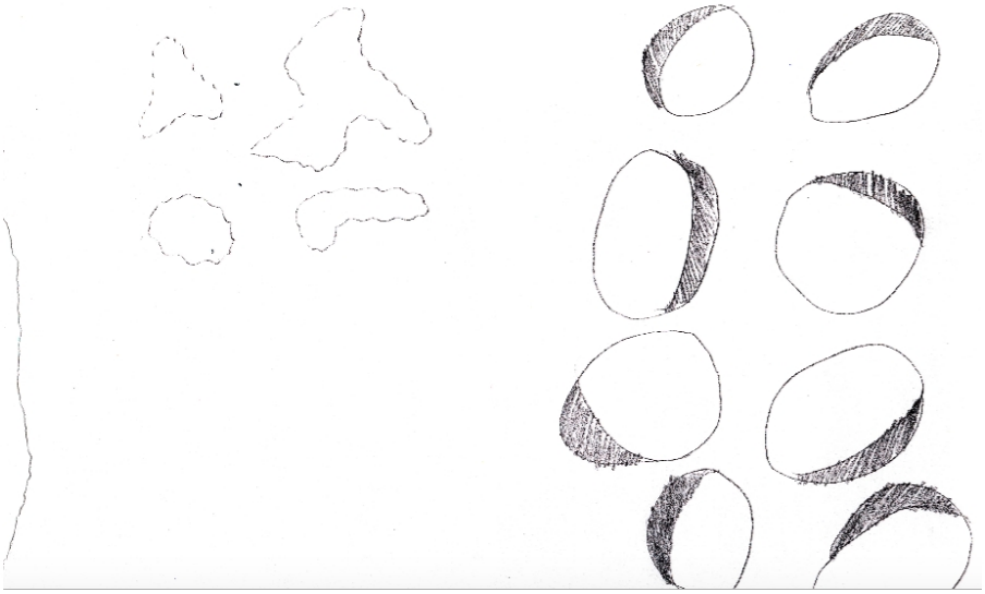

Figure 5.2.5 Representational drawing of heel positions and possible movements.

From this came two important discoveries that resonated through my entire thesis, that when we talked about touch there was in effect a semiotic mixing of the senses going on, in that we would say ‘look here’ and then point at something not visible in the audio recordings, indicating a syntax which did not cross the sensory divide between sound and touch, and secondly that it was not possible to draw the point of contact even when it can be visible, say when looking at something touching glass. While I could map where and how to touch and how to move, drawing the two points of contact touching was only possible at a dissection which cut the contact points into pieces. Subsequently I realized that it was also not possible to draw what a touch feels. While these sound trivial, noticing them was a revelation, and it made me determined to represent the music through various senses rather than just touch because when I did that I created the means and the music rather than a representation, which was my aim. This

Figure 5.2.6 Made recorder head stock.

Figure 5.2.7 Made modified recorder head stock.

realization came through practical experimentation, some of which emerged from contexts outside of my thesis. Thus, the final score consists of multiple signs in the body of senses representing a particular aspect of the music suitable for that sense.

Thus, I arrived at a triptych notation system where I would utilize three senses in order to communicate one sounding touch. But this triptych was not just a material collection of paper, metal and wood, I wanted it to communicate the symbolism of the heel as it exists in historical literature; I wanted to communicate the coolness of the breath as it hit the heel at the bottom of the instrument, and I wanted to communicate the closed keys as the fingers depressed them. In one sense, vision, the notation would map out where to touch and with what and that this touch would result in a complex yet symmetrical sound. In another sense, touch, a notation would map out what it felt like to touch, what was its temperature and sharpness and how that touch lived while in contact. Finally in another sense, hearing, a

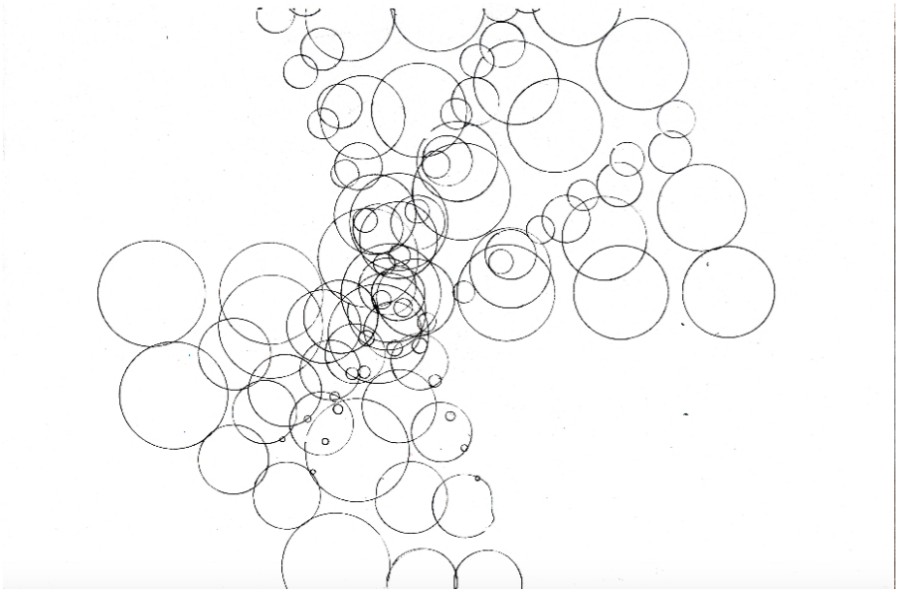

Figure 5.2.8 Visual score for Heel.

notation would map out what the music sounded like. This way the triptych notation would act as parts of a gestalt leading to a full understanding of the music.

Figure 5.2.9 Tactile score for Heel.

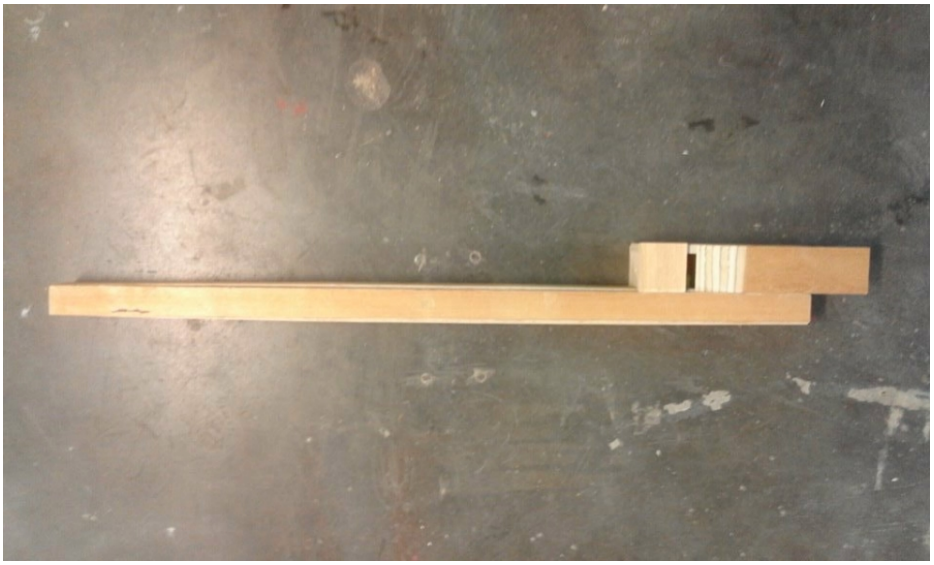

Figure 5.2.10 Sounding score for Heel.

The final score for *Heel* consists of three parts, one made from paper onto which circles are drawn in a way as to suggest movement and complexity, a second of a ready-made piece of stainless steel where the

diameter of the hole is the same size as the diameter of the hole in the Paetzold and which is cold to the touch, and thirdly a wooden DIY style replica of the Paetzold instrument itself where there are no finger holes and no air hole depicting the covering of all the holes of the instrument. During the making of the replica, which copied its sound production method from the organ rather than directly from the Paetzold, which is copyrighted, I also made several recorder head stocks in order to understand how the sound production system worked and how I could manipulate it. These can be seen in figures 5.2.6 and 5.2.7.

5.2.2 Conclusion

In his writing *What a Musical Work Is* Jerrold Levison argues that music is a sounds structure and its performance means, as intended by the composers. He says, in order for works of music 'to have the definite aesthetic qualities we take them to have, instrumentation must be considered inseparable from them'.[41] Nevertheless, even when the performance means are included in music, Levinson does not clearly define if they are important in the aesthetics of music, nor does he explicitly talk about touch as a means to make music or even sounds. In my work *Heel* I explicitly aestheticize touch as the means to make music and as the primary location of the notation. The practice then recasts my original question and reveals the inherent problems of touch-communication and forces my process to include senses outside of touch to solve the tactile or tangible communication between composer and musician.

41 Ibid., p.27.

The composition *Heel* asks the musician to learn to touch by interrogating the relationships between musical notation and touch by distinguishing between different forms of writing touch and suggests a body of touch-writing that cross-sects the body of senses so that the composed work is inter-expressed between these perceptual relationships. These forms are: writing about touch, figuring touch, and sculpting touch. Writing about touch means a description or tablature (in the sense that it is a mapping of an instruments topology) of where and what to touch. Figuring touch means describing the touch as figure, illustration or trace, drawing out what the touch looks like by drawing around the touch that cannot be seen when touch happens. Sculpting touch means using physical and tactile objects to demonstrate what the touch feels like. Because of the vast possibilities of symbolic representation within the senses these different forms of writing can be made to point to a same referent, the sound-touch that results in a single sound combining the sound structure, the physical means to make that sound and the means to communicate the music to the musician.

The next step for this composition would be develop a specific tool for the heel to better control and feel the elements constituting and creating the music. This could be a type of shoe or device that would be placed over the heel so that it would easily access the hole, as can be seen from the pictures the heel must be lifted by the musician to play the air-hole and this keeps the foot in tension.

5.3 *Violino-Piccolo*

Violino Piccolo consists of six composed musical instruments which all imitate and are made in the form of the ¼ sized violin. The materials used for this work are cardboard, wood, and paper. The instruments consist of five parts which abstractly replicate the volumetric three-dimensional shape of the violino and one part which ignores its volume and presents flat echoes of the process's outline. The piece does not have traditional performance but the making of the instruments is the performance of the composition. This can be seen on the pen-drive. Unlike *Heel*, which is asking the musician to learn to touch, *Violino Piccolo* asks the musician to unlearn and to de-habituate their touch from the known relationship between a physical shape, its feeling, and its sound. This way the work separates the known technical skill, the physical motion of the fingers and hands and connects them with unknown feelings and sounds resulting in an exploration of the instruments rather than playing a piece or improvising. This change in the musical experience happens because the score is only available to the touch that is specific to the body of a single instrument. It uses the body of the instrument as an icon to exscribe the shape of the instrument out of the body of music into sculpture in order to approach musical notation and its relation to touching once it turns back into the body of music.

The composition interrogates what Stephen Davies defines as tablature's 'iconic character', by which he means that 'the fingers disposition on the neck of the instrument is depicted'.[42] In *Violino-Piccolo*

42 Stephen Davies, *Musical Works & Performance* (Oxford: Oxford University Press, 2001), p.102.

the depiction of the fingers' disposition on the instrument is altered in two ways, by making it tangible, by changing the way each position and fingering pattern feels and sounds, thus while the technical form of playing might be identical in the representation the music is not.

Figure 5.3.1 Violino-Piccolo instrument family.

Davies also argues that this iconic character of tablature is problematic because using instrument-specific notation is impractical.[43] That is, because 'the specificity of the notation counts against the adaptation of the piece for other ensembles.'[44] The work *Violino Piccolo*, as all my pieces do, critiques this notion of impracticality by creating instrument-specific notations from basic materials such as cardboard, paper, and wood, showing that it is easy

43 To be somewhat cynical, it could be argued and is argued, that the whole orchestra is unpractical. Most art is unpractical and this argument, in my honest opinion, is irrelevant to the question of what music is.
44 Davies, *Musical Works & Performance*, p.101.

to make instrument-specific notation which can be transported or made on site, but also by stressing that when the piece becomes about the relationship musician have with their instruments, the important matter is not if the instrument is exactly the same, but in the way the score feels even if it were the shape of a different instrument.

Figure 5.3.2 Violino-Piccolo instrument family 2.

5.3.1 Practice Diary for *Violino-Piccolo*

Starting the research for this piece I was initially interested in the historical legacy and material archive of the violino piccolo in ensemble repertoire and I studied its popularity in the development of the violin sonata. My two main examples were Maurizio Cazzata's *Pelican* for two violinos and J. S. Bach's Branderburg *Concerto No. 5 in F*. Rather than study the sounding results of the notation for these two compositions, I was interested in how the violino-piccolo was able to scale down the physical touches and gestures of the violin without the composer believing that they were essentially and

technically playing a different instrument. In other words, I was interested in observing the difference in the tactile relation between how the same shape felt at different sizes.

I started by making wooden forms that I hypothesised would feel the closest to the traditional violin. This turned out not to be the case because I became more attracted to the rough surfaces afforded by the material and thus the smoothness of a finished violin is only available to the touch in the paper form. This phase resulted in two wooden forms, the first, seen in figure 5.3.4, was not used for the final piece but was interesting enough for me to keep for some later date.

Figure 5.3.3 Working on the wooden form of Violino-Piccolo.

Figure 5.3.4 First, unused wooden form.

The second form seen in figure 5.3.5 resembles the violino but it also resembles the interior form of the violin making process (discounting the

holes used for clamps). After making the wooden body, the paper parts were made by using this wooden form as an interior form of a violino demonstrating a physical iterative process of development. I soaked the paper and pressed it onto the shape and then taped it there until dry. After drying I took the moulded paper strips and shaped them with the top and bottom.

Figure 5.3.5 Second, used wooden form in Violino-Piccolo.

Figures 5.3.6 to 5.3.9 show how I moved away from the shape I had made in wood by moulding paper I started playing with and manipulating that shape so that it would more and more clearly resemble the violino-piccolo until finally it reached the card-board form which I used to do most of the exploration of the working questions on instrument specificity of tactile notation.

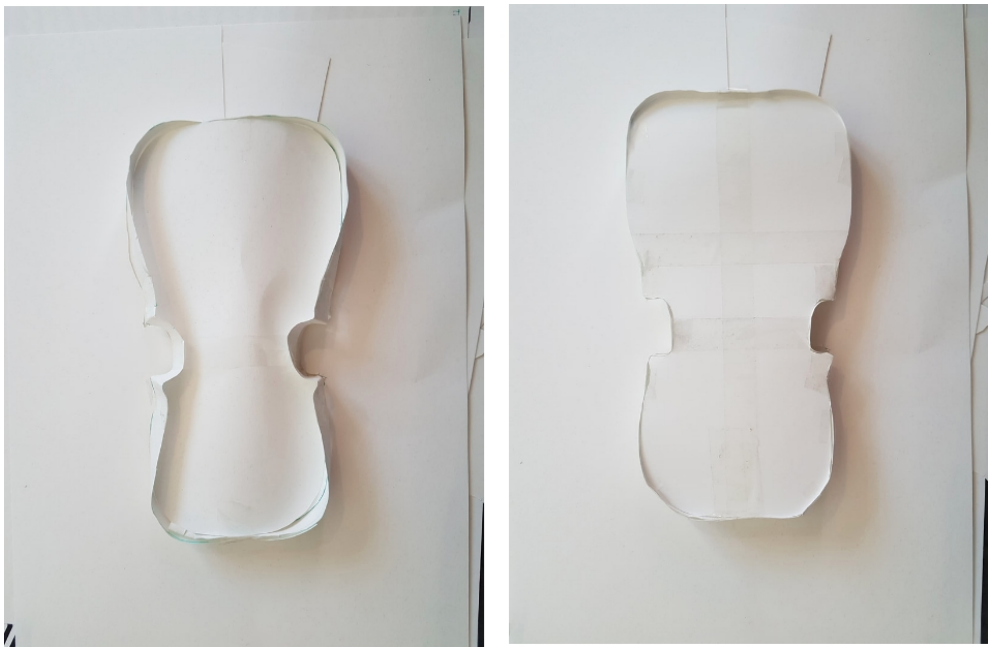

Figure 5.3.6 First paper form in Violino-Piccolo.

Figure 5.3.7 Second paper form in Violino-Piccolo.

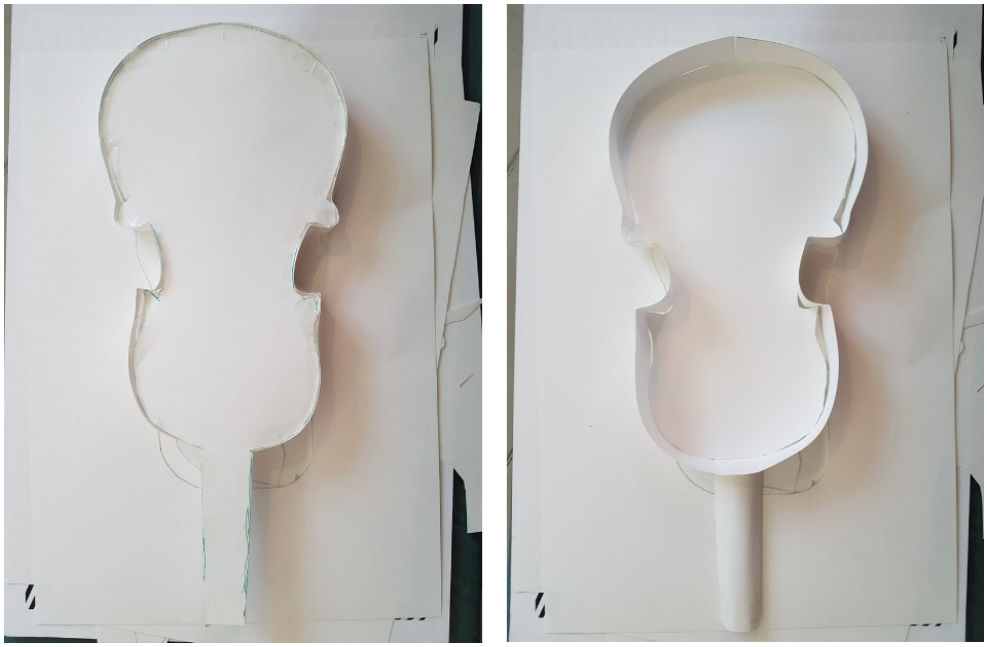

Figure 5.3.8 Third paper form in Violino-Piccolo.

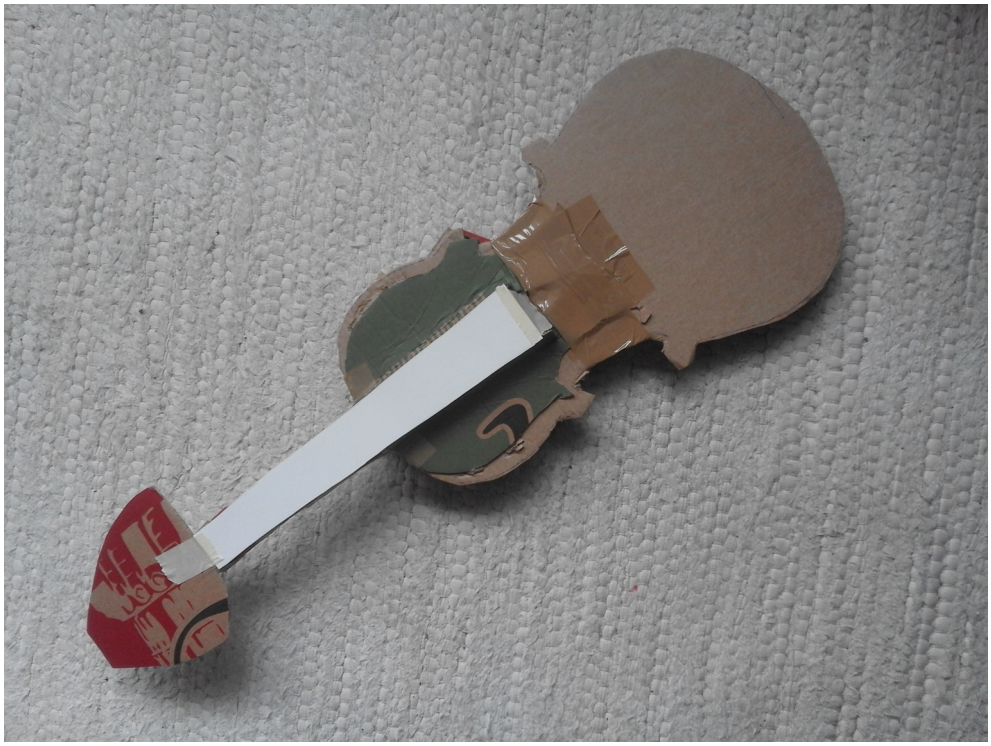

Figure 5.3.9 Cardboard form in Violino-Piccolo.

While I took as my reading of the instrument the historical developments of the physical body of the instrument, the piece *Violino-*

Piccolo directly interrogates the problem of notation for touch and demonstrates how it is possible to work towards a notation that takes into consideration the physical embodiment of playing the instrument. In order to interrogate touch on the composed musical instrument, I devised a systematic method whereby I would create a tablature in the act of playing which incorporates playing and notating simultaneously, thus mapping out the movements of the fingers in colour on a flat piece of paper. The method of writing at – and here I distinguish writing at, from writing on, the instrument as being the difference between writing while playing the instrument and physically writing on the body of the instrument – the instrument is not uncommon for composers, especially the piano is used, for example by Stravinsky who describes the process as 'looking for some distance of my fingers which correspond to intervals, and these intervals are really music ideas.'[45] What changes significantly is that the notation happens where the fingers themselves play and that this happening is the music.

Below are two solutions to mount types of fingerboards to my *Violino-Piccolo*. The left shows how the cardboard is made to host

Figure 5.3.10 Detail of fingerboard in cardboard form of Violino-Piccolo.

45 John Randolph, *A Conversation with Igor Stravinsky, 1957*, online video recording, YouTube, 14 August 2016, <https://www.youtube.com/watch?v=oJIXobO94Jo> [accessed 25.4.2019].

prosthetics that act out a three-dimensional mapping of the strings of the violino. The cardboard piece attached to the fingerboard is movable and audible and forces the fingers to behave differently even when their position is familiar. On the right, a paper is placed over the fingerboard to map out movements in time by marking each touch by drawing or painting it onto the white fingerboard.

Rehearsing this movement of the fingers I would get a feel for it and I would then feel the difference of those same touches on the fingerboard of the real violino. (See *Violino-Piccolo* documentation, [Clip of Violino Piccolo no. 6.mp4], on the attached pen drive.) In the fingerboards shown in figure 5.3.11there is the same musical gesture notated several times onto the body of the instrument. The colours blue and red represent the finger combinations 1-3 and 2-4 respectively, and the hands start from the top and move down towards the bridge as the two fingers combinations move.

Figure 5.3.11 Several painted fingerboards.

Figure 5.3.12 Two taped fingerboards.

Figure 5.3.12 shows how I used tape in order to see what the difference was that I felt while moving. The tape was far more tangible and the resulting tactile tablature became repeatable without looking. In order to interrogate the argument that such a tactile notation is instrument-specific I decided to try and transpose the touches onto a flat keyboard using the keyboard layout of the Terpstra Keyboard or Tonal Plexus, which would allow for the back to front movement possible on the keys as with the violin, rather than the typical sideways movement of the piano keyboard. These can be seen in figures 5.3.13 and 5.3.14; in them the finger combinations again move together. The aim of this phase is not to show how the two sound the same, but to demonstrate that it is possible to transpose touches and tactile scores from one instrument to another so that the feeling stays the same.

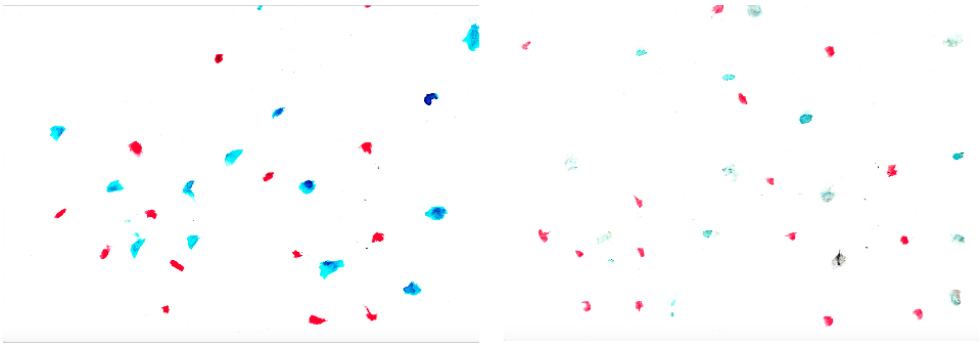

Figure 5.3.13 Four transposed tactile scores.

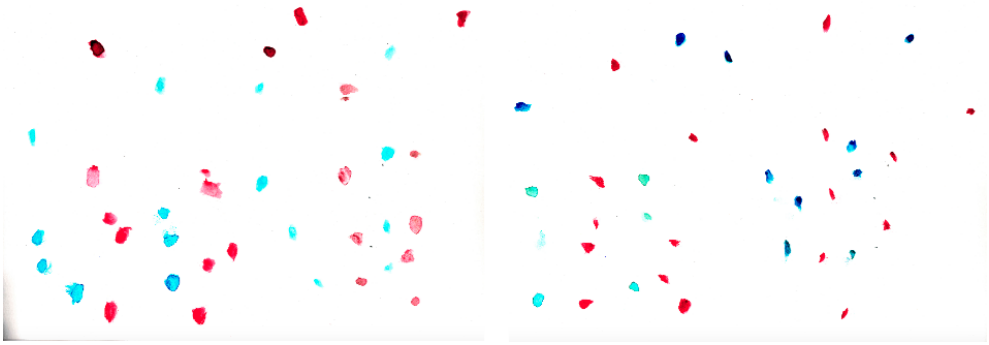

Figure 5.3.14 Four transposed tactile scores.

What can be seen in this work is how the study of music changes when the score is only available to the touch. What the score must take into consideration is not just that it is written on a piece of paper and uses a specific instrument, but that the score needs to embody a much wider range of parameters if historical and musical information akin to that of the traditional visual score is to be communicated via touch to the musician.

5.3.2 Conclusion

Rather than changing the way the familiar touches of the original instrument sound by using modifications and preparations, the new instrument changes the touches, the feel, its materiality, and the sounds of the original instrument while keeping its gestures. This demonstrates a de-habituation of actions and touch and the experience with the instrument first becomes about re-learning the sonic possibilities of the form of the iconic instrument, and secondly about learning how to play a completely new instrument for which familiar gestures and touches are available and which cause flash-backs to a known object. By interrogating the sonic relationship between the violin and an object that can be recognized as appearing iconically as a violin, I argue against Davies and the notion that instrument-specific notation is unpractical and un-related to other instruments.[46]

The work also argues against Peter Kivy, who says that tablature does not contain the music because it does not provide a full picture with which the mind can comprehend the music as mental sounds, he says:

46 In this sense various articulation marks, such as *slide* or even *portamento* when notated for the piano also demonstrate how instrument specificity is transcended by the reality of touching and playing an instrument.

> A set of parts alone cannot give a picture of the whole, as can a score. A tablature is, indeed, a kind of score, for, unlike a part, it contains the whole composition. But it does not contain the music as a visible structure that eye and mind can translate into "mental sounds." It is merely a recipe – instructions for the fingers – which, if properly followed, will result in a performance of the work.[47]

By its nature as a non-visual medium the tactile notation can have no total image that the mind can comprehend at once. More importantly there is no need for this total image because the music does not take place within the sense of vision but in a mixture between touch and sound. Thus I argue that my work demonstrates how studying and playing music only available to touch contains the whole composition, which, as I demonstrated, can be iterated through sensory translations to tablature, and from tablature to stave notation but that this is superfluous and unnecessary because the tactile score contains all the music and the performance means in the same physical location even if it cannot be seen at once.

47 Peter Kivy, *Sound and Semblance* (Princeton: Princeton University Press, 1984), p.102–3.

5.4 *The Land Singing*

The Land Singing is a composition for any number of musicians who play several instruments that are installed in a space. In the documented performance the instruments were installed in a yurt. (See *The Land Singing* documentation, [01 The Land Singing Performance.mp4], on the attached pen drive.) The composition was premiered at a music festival and over the duration of two days more than two thousand people played the composed musical instruments. There are three instrument families in the work, a bowed string instrument consisting of two wooden sound boards hung by guitar strings form large canvas resonators installed on the ceiling, on top of the soundboards are placed ceramic vases which contain plants. In the premier only one board was used. A plucked instrument made from an old sewing machine table at which the musician would sit, and of two wind instruments made like organ pipes that were mobile and easy to use. This piece emerged from a collaboration with artist Egle Oddo with whom I speculated about new and possible tactile relationships between humans and plants in the everyday environment. The work takes a new start to the previous two works by looking at the aesthetics of touch through the inclusion of all physical bodies into making of music and how that can result in a music that is not bound to human intentions and actions.

Figure 5.4.1 shows the entrance to the world we made in which the audience is transported away from the everyday and in which their sensory habits are de-habituated through instruments, sculptures, plants, animals, and humans all coming together to play music with instruments that they

have never touched before and which thus interrupts their everyday lives in a positive way.

Figure 5.4.1 The Land Singing space seen from the outside.

In this composition I wanted to answer the problem of how the interaction between music and touch can be made communicable. During the performance of this piece the composer's body and body language acts as the score from which the audience can grasp what to play without verbal or written explanations. This non-verbal communication served as an embodied and tangible score. By including plants as musicians in the composition I was able to start interrogating the question of what does touch

sound like, leading me to recast that question as whether or not tone in music is only related to human touch. The inclusions of plants in musical performances in this way is reminiscent of John Cage's *Child of Tree* (1975), which is also concerned with the touching of plants. However, I would argue that Cage is ultimately concerned with using plants as instruments in a more or less conventional way and that the fact that plants are touched is no more significant than that a violin is touched in a Bach Partita (though no less significant, either). Much closer to my project is the comment Cage makes with reference to engraving:

> It seemed to me that to be able to be able to engrave required a certain calmness. And it's that calmness that I've been, one way or another, approaching in my music, writing, and so forth. And then it became physical, you see, with the engraving tool.[48]

The Land Singing brings people and plants together in a collaborative, tactile activity that focuses on constrained movement, balance and the development of tone over time. I started by exploring the musical parameters of touch and in working out what musical decisions I can transfer away from human touch into the touch of the plants. While helping me understand the parameters of touch in music it also led me to the form of the instrument which is designed to be touched by both humans and plants. In the case of *The Land Singing* the plants weight determines the tuning of the instrument and the plants touch chooses tone and timbre emitted by the string when it is touched by the leaf or stalk of the plant. Writers such as

48 Crown Point Press, *John Cage at Work 1978-1992 (44 minutes)*, online video recording, YouTube, 14 January 2014, <https://www.youtube.com/watch?v=WGNwiQviiGU/> [accessed: 5.6.2019]. Quote starts from around 9 minutes.

Roger Scruton have located the tone in the experience of hearing, he says that

> [m]usic makes use of a particular kind of sound: the acousmatic event, which is heard 'apart from' the everyday physical world, and recognized as the instance of a type. This isolation of the pure sound event leads to a peculiar experience, which I have called the experience of tone.[49]

By giving away the power to tune and finger the instruments' tone to the plants I wanted to interrogate the idea of touch and tone as a special activity and to see if it could arise from the touch of another species. The plants actively engage in making the tone the plants also hear the tone and respond chemically, and some studies show that plants respond to buzzing noises and thus the instrument is designed to make buzzing noises.[50] (See *The Land Singing* documentation, [01_The Land Singing Body Score Timo.mp4], on the attached pen drive.) This is done for the plant but also for the musician, whom I wanted to make feel as if they were laying in a field, with plants around them and with insects flying above them, as the sound of the buzzing came from the resonators attached to the ceiling. In *The Land Singing* a continuous artistic interest emerges which is repeated throughout this thesis. This is the possible role of touch and designing instruments which combine empirical testing with musical playing within the sense of touch as mediators for a semiotics of interspecies aesthetics and communication. There is a big question here about the indeterminacy of the touch of plants that cannot be answered before a clear definition of plant action and agency is made. My hypothesis is that the music is not indeterminate but that the

49 Roger Scruton, *The Aesthetics of Music* (Oxford: Oxford University Press 2009), p.2.
50 Michelle Z. Donahue, 'Flowers can hear buzzing bees – and it makes their nectar sweeter', 15.1.2019, <https://www.nationalgeographic.com/science/2019/01/flowers-can-hear-bees-and-make-their-nectar-sweeter/> [accessed 1.6.2019].

plant decides what it likes. In this way I want to combine metaphoric and allegorical language to play with ideas about how touch can change our relationship to music and how music might not be exclusive to humans but could include all beings that are able to touch.

5.4.1 Practice Diary for *The Land Singing*

In *The Land Singing* I wanted to make a piece of music that would interrupt the day to day tactile habits of the audience. From the start our plan was to work with plants, and during the performance we had plants for adoption to any willing audience member. In the planning we decided that a yurt would be good to house the work since it would isolate us from the rest of the festival but also give us more possibilities to install works in the space to create an immersive and separate world into which the audience would enter. Thinking about the parameters of music and how plants could use them, I thought to pitch level and tone, since they are related to tension and thus weight, thus, the growing of plants and the contact between the plants body and the string would control the tone. Thus, the instrument turned vertical so that the strings which would be played would also support the body of the instrument where the plants would stand, as can be seen in figure 5.4.2. This way the plants' leaves could also interact with the strings.

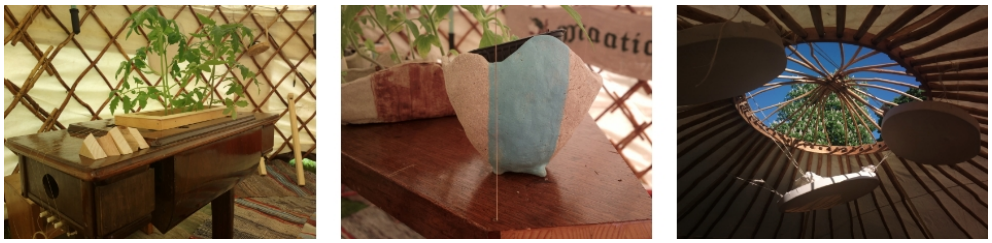

Figure 5.4.2 Details of the instruments.

As mentioned, the hanging instrument was initially designed in two pieces which would be parallel to each other so that the human musician could be between them. Due to limitations of space only one surface was used.
The second instrument, seen in figure 5.4.2. was a sewing machine table that was converted into a flower pot from which strings were extended over the sides where the tuning machines were and which were used by the human participants. Here the audience could play with their fingers or with the plectrum that were also provided in various wooden shapes, while the plant responded to the vibrations directly in front of their faces. The third type of instrument was in fact two separate organ pipes (40 cm and 80 cm) that one simply blew into and they would make a tone designed to be used by anyone from adults to children, as can be seen in figure 5.4.3.

Figure 5.4.3 Audience performing The Land Singing.

Figure 5.4.4 Audience holding the instrument to keep it from moving.

In figure 5.4.4 two audience members are shown who played the instrument with one hand and balanced the board with the other. This was unexpected because as the physical score of the music I never did this, but instead controlled the movements by the pressure I was putting on the string with the bow. As can be seen in figure 5.4.5, audience members would often take the bow in one hand while holding familiar objects in the other hand. The touch both who touched the sound board made, having the same function and aesthetic, revealed to me that affordance and design combined with visual haptics can overcome the representation of the score, and turn the touch of the musician towards interpreting the music rather than strictly following the score as it is presented. In this sense the touch the two players made interrupted my scheme and helped me better understand how the audience can be brought to touch the composed musical instrument without my physical presence.

Figure 5.4.5 The composer, in yellow apron, can be seen to act as the score for the audience.

5.4.2 Conclusion

The Land Singing interrogates how touch, vibration, and smell can mediate musical decisions which are perceived as not being merely pathological. In the context of plants, participating in making the music the notion of a pathological reaction is relevant because Eduard Hanslick has argued that the judgement of what is beautiful in music cannot arise from the 'overpowering effect' of sound and its 'action on our nervous system'. He argues that this has nothing to do with musical beauty because what is heard this way does not arise from 'free will' but is only a pathological or behavioural reaction to sound.[51] What makes up music are the 'intrinsically pleasing sounds, their consonances and contrasts, their flight and re-approach, their increasing and diminishing strength – that it is, which in free and unimpeded forms, presents itself to our mental vision.'[52]

These elements interconnect in the score which consists of the body of the composer, constantly playing and showing how the instrument needs to be touched, and the plants that participate in their own way in the mingling of bodies and act on their own on the strings which are the sound source. This enables an instrumental interconnection that I argue mediates a communicative and aesthetic relationship between people and plants because the function of playing and touching of the instrument results in different vibrations that mean different things for humans and plants, mixing the symbolic on the practical and performative level. The chemicals emitted by the plants in their actions also have a relation to the feeling and emotions

51 Eduard Hanslick, *The Beautiful in Music*, trans. by Gustav Cohen (London: Novello and Company, 1891), p.122.
52 Ibid., p.66.

of the player and thus feed back into the how the instruments are touched and what the skin feels when playing. That the single musical instrument that is touched by many beings at once brings them together in a common activity where each musician acts out the score with their bodies while embodying it in their actions that can be copied by others either by watching or by touching the score and following through touch what the body does.

5.5 *Twang & Twang II: Seeding Tonality*

Both *Twang* and *Twang II: Seeding Tonality* consist of a very long monochord installed inside a building, turning the building in effect into a very large instrument. This means that the string is installed on a wall or between walls in order to explore instruments that are the size of buildings. This work continues my critique of Davie's notion of the instrument specific notation by utilizing a single string for all iterations, simultaneously solving the problem of impracticality by making a site-specific instrument that people have to come to in order to experience. The work also explores how instruments can accumulate parts and objects that are found objects, in the sense that they are not made by the artists, and also how the scale of the string alters its relations to the body, touch, and movement. Initially, the two composed musical instruments were thought of as variations of the same instance, but the results were so different that they could be thought of as two separate compositions. For the purpose of this thesis I consider two instances of the same composition.

Twang consists of a twelve meter long piano string and two wooden parts, a bridge and tuning peg which is designed to wrap around a corner like a hook, which has a specially designed harmonic bridge that touches the string when it vibrates, giving it a longitudinal signal as well as a vertical vibration, creating an uncommon sound. This string can then be fingered against the wall, using it as the fingerboard. (See documentation, [Twang Fingering the Wall.mp4], on the attached pen drive.) *Twang* was made for the gallery *Love&Money* situated in an advertising office in Helsinki and

thus its considerations also included problems related to installing for a month a composed musical instrument in a space where people worked every day. *Twang II: Seeding Tonality* consists of a 22 meter long piano string that is strung permanently between two walls by using a piece of wood and a piece of metal. This work is permanently situated in a large abandoned theatre in Gibellina, Sicily, which was designed by Pietro Consagra. The string is placed over a concrete hand rail and can be fingered on this rail or can be bridged in various ways using a wooden sound board. Its first performance was in 2018 with artists Egle Oddo and Antti Ahonen. The performance combines live art and performance with sound art, where each artists works in their own field. It can be viewed on the attached pen drive (see documentation, [00 Twang II Seeding Tonality.mp4], on the attached pen drive). Its second performance was in the summer of 2019, with Aldo Tuhkanen and Filippo Pirello, which can be viewed and listened to on the pen drive. This performance is a group performance where all participants are playing the instrument. (See documentation, [Twang II Seeding Tonality June 2019 Group Close Audio], on the attached pen drive.)

In this work I wanted to interrogate the experience of the musical instrument when changing the size of the instrument so that the instrument holds the musician rather than the musician holding the instrument. The two sizes of this work show a dramatic difference in the way in which I needed to approach the scale and ergonomics of the instrument and how that changed the touch, the movement and the musical result. In *Twang*, the first iteration, the open sound is produced by a long string and a harmonic bridge

at a specific length from the nut to produce longitudinal vibrations with the typical latitudinal vibrations that normally cause a tone. In other words, the bridge touches the string during every vibration and gives a futuristic sound quality (by futuristic I mean it is a sound that could easily be imagined in a science fiction film). (See *Twang* documentation, [06 Twang Sound Example.mp4], on the attached pen drive.) Using the resulting timbre I was then interested in how the texture of the wall could be used as an indeterminate tactile tablature that could interrogate how the string and the wall felt and how much resistance the finger feels when it is fingering all the notes.

In *Twang II: Seeding Tonality* the string is mounted over a concrete railing with the idea of using it the same way as a tactile tablature but the length of the string and the texture of the railing made this result uninteresting. Using the same idea of the bridge as a passive tapper of the vibrating string I ended up using pieces of wood as bridges to cause a secondary rhythm in the larger vibration as well as to prop up and tension the string. This could be done either statically or so that the piece of wood was hinged between the string and the thighs of the musician by the edge of the railing, and thus the musician can tension and release the string at will shifting the pitch up and down and giving the sound an eerie microtonal quality. The relationship of the wood and the string as it vibrates freely can be heard in the video examples and what occured was that the sound moved from the point of contact between myself and the string to the bridge, which in effect became a sound board. (See *Twang II: Seeding Tonality*

documentation, [00 Twang II Seeding Tonality.mp4], on the attached pen drive.)

5.5.1 Practice Diary for *Twang* and *Twang II: Seeding Tonality*

The design of *Twang* came from a discussion with Love&Money curator Mark Maher and our desire to make an instrument that would work in an office space so as not to disturb but also to be interesting in terms of touch and sound. The visual design is related to historical research I am doing about Karelian decoration, the two headed axe is a traditional shape found in both in jewellery and in construction of houses but also in boxes where the metal bracing of the box would be shaped into the shape of a two headed axe. Thinking about the mounting of the wire on the wall I had in my use I liked the idea that it would be a brace that would hook the wire around the edge of the wall, which was untypical for the exhibition space that normally only had works on the wall itself. This can be seen in figures 5.5.1, 5.5.2. and 5.5.4. The bulky and unfinished style seen in figure 5.5.1 and 5.5.4 of my woodwork brings out the tactile aesthetic I want to express.

Figure 5.5.1 Detail of Twang installation.

Figure 5.5.2 Installation view towards main office.

Figure 5.5.3 Installation view towards main space.

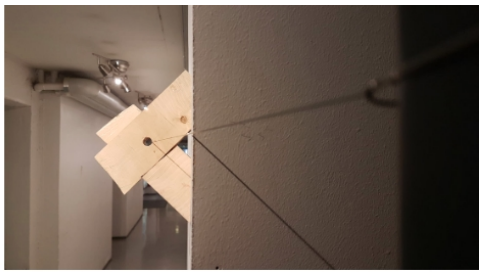

Figure 5.5.4 Detail of Twang installation.

Figure 5.5.5 Twang exhibition opening and during office hours.

Figure 5.5.5 shows the opening of the exhibition *Twang* and the audience members playing the instrument as a group organized along the length of the string in the corridor of the gallery.

In *Twang II: Seeding Tonality* I was immediately drawn to the acoustics of the large space in which I had decided to make the instrument. The outside of the building can be seen on the pen drive. (See *Twang II: Seeding Tonality* documentation, [13 Twang II Feeling the Space_01.jpg], on the attached pen drive.) The interior of the building is visible in figures 5.5.6 and 5.5.7. The building is designed by artist Pietro Consagra and its construction started already forty years ago. The building has seen a number of artistic projects pass through it without leaving a trace and interestingly, there is almost no graffiti. The acoustics of the building call for something big, and the resonance of the building and the size of the instrument resulted in an instrument that droned its sound within the reverberating echoes of the space the making of which can be seen in figures 5.5.8 to 5.5.11.

Figure 5.5.6 Playing Twang II: Seeding Tonality.

Figure 5.5.7 Installing Twang II: Seeding Tonality.

With and without the sound board the loudest of string sounds could be agitated from almost anywhere on the string. The acoustics of the space and the length of the string brought out little of anything which happened in *Twang*. In *Twang II: Seeding Tonality* the sound-board placed at any point on the string would then become the sound board of the complete space, while there would be very little in terms of change in pitch as happened in *Twang* because both sides of the string would always vibrate. The sound board on the other hand focused the emission of the sound to one point that could be over ten meters away from the player, really making evident how sending signals by touch can displace the body from the sounding object. Without the sound board the sound came from the interacting of the string

Figure 5.5.8 Installing Twang II: Seeding Tonality, 2.

first with the air, and then as the oscillation slowed down the string would hit the ledge and hit off things that were on the ledge.

Figure 5.5.9 Installing Twang II: Seeding Tonality, 3.

Figure 5.5.10 Installing Twang II: Seeding Tonality, 4.

Figure 5.5.10 Installing Twang II: Seeding Tonality, 5.

5.5.2 Conclusion

Twang and *Twang II: Seeding Tonality* interrogate the relationship between musical order and space and the time it takes to touch points by using a very long monochord where timing and rhythm between one sound and another is determined by bodily movement in space of the player but also by movement of the sound board. This piece works specifically by taking a musical material, the piano wire, and physically transforms the architectural and infrastructural locations into musical instruments in which human bodies become tiny. The scaling up of the instrument or scaling down the body in relation to the instrument becomes about re-learning and playing with sounds which emerge from the scale of the instrument and its design.

In this work notation and musical writing are traces found at the site, physical features in the surfaces of the walls that surround the instrument, but also left by the act of playing by the instrument touching the space. The up-scaling of *Twang* and taking it off the wall and placing it over a concrete hand rail unexpectedly resulted in a secondary change in the experience of music and the difference between playing Twang when compared to the guitar was almost as big as playing *Twang II: Seeding Tonality* when compared to *Twang.*

The disjointedness of the new musical experience, which is reduced to one string, limits the possibilities of feeling touch and focuses the touching to the movement of the body in space and time in two major ways: by forcing the body to move large distances to make specific sounds, and also by moving the location of the sound away from the body, for example

by placing a wooden soundboard ten or twenty meters away from the strike the sound happens at the board and not at the location of the strike, an effect which is undetectable on a traditional-sized instrument the body is able to hold.

5.6 *Sonic Independence*

Sonic Independence consists of a forest planted in 2018 as well as composed musical instruments that are played entirely by plants and in a collaboration between humans and plants. The work is conceptual and performative, and its timeline consists of me acting out the ideas related to the concept. An important part of this process consists of a speculative pedagogical project to develop a pedagogy to teach plants music. Because of the projected time scale of the project, from 2018-2099, this thesis can only hold parts of the whole composition, which will be in process until the end of the century. Figures 5.6.6, 5.6.8, 5.8.9, 5.6.10 and 5.6.12 are screen captures from the video documentation made for the exhibition *CrossSections: Intervals*. (See *Sonic Independence* documentation, [00 Film Sonic Independence.mp4], on he attached pen drive.) The video has no audio.[53]

The planted forest consists of an area of eight to ten ares – an *are* being 100 square meters – and currently of one hundred and fifty trees, as well as various bushes, grasses and other plants. The structure of the plan consists of several sequential and cyclical parts as well as over-arching projects like observing the plants, and understanding and developing a plant pedagogy. The cyclical parts are organized according to the lives of plants and their growth patterns and consist mainly of planting and caring for plants and making musical instruments that the plants can play, installing them in the forest and listening to the outcome.

53 The video has no audio because after careful consideration I decided that I did not want to affect the imagination of the viewer, nor myself, with environmental sounds.

Figure 5.6.1 Drawing of musical instrument only for plant.

Through this work with the forest and its sounding touch I want to investigate the role of instrumentalizing tactile objects and the relationship humans have with other beings through the concept of the instruments. Rather than utilizing the plant as an instrument *Sonic Independence* places instruments between myself and the plant. In this way I start to bridge the gap between us in a way that I hope will create an example where other

humans also stop instrumentalizing plants themselves and learn to find new ways and reasons for living with and growing a forest. Thus, the instruments act as tools for reaching something that I cannot grasp: the mind of plants.

Like many of my pieces I started working on *Sonic Independence* by observing and figuring the relations between bodies and instruments through documentation and imagining what it would feel like to be in those situations involving touching, as well as how and what instruments can come between those touches. Three basic ideas for the instruments emerged from observing how plants touch and how humans touch plants. The first is an instrument that is imagined as being wholly for the plant, seen in figure 5.6.1. It is an un-human, non-graspable, as inconceivable to humans as a microscope is for plants. Yet, I would like to imagine that it also holds within it the seed of understanding within the domain of our shared sense of touch. By this I mean that the only sense we know humans to share with plants is touch and it is within this sense that I imagine us to communicate.

Figure 5.6.2 Drawing of forced collaborative instrument, after bonsai.

The second, seen in figures 5.6.2 and 5.6.3, is the taming of the plants and the creation of a physical command structure that allows the plant to act and grow in only one way. This problematic line of practice comes from *bonsai* where by various procedures that remove needles, leaves, and bark, the size and growth of the tree is controlled and where even violent actions are performed on the tree in order to shape it to the will of humans. Thus while I think that there are aspects to be gained from studying bonsai, especially in regard to the pedagogy of teaching plants music, the cutting, pruning, and wiring needed to train the tree does not feel right in a project that aims to give plants their own mouth and not merely a voice.

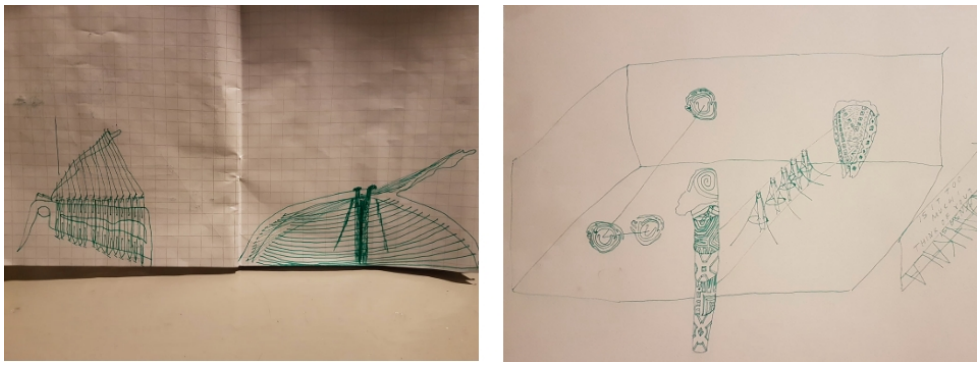

Figure 5.6.3 Drawing of forced collaborative instrument and possible installation for exhibition.

The third line is between these two and is where the two mix and where problems of conditioning and forcefully training plants by using tools to get desired results are partially within the same sphere as the solutions for moving forwards purely with plant agency and autonomy. This mixture is where decision-making is continuously being transferred between human and plant and in which the fabrication of composed musical instruments can start to interrogate my research questions.

Figure 5.6.4 Harp shaped tree in forest.

5.6.1 Practice Diary for *Sonic Independence*

Researching the touch of plants, it becomes evident that trees are not only air beings like humans, and their leaves the only location of sound, but they are equally earth beings as well. From a material perspective I am drawn to wood and skin, both natural materials that can live with the forest and which both have good acoustic properties. In the context of the forest it brings with it a strong symbolism of death to the work; the living holding the dead. This image, of trees holding objects and the dead is found in various regions including Eastern Siberia where the larch is seen as a holy tree that is decorated by hanging expensive things in it. In *Sonic Independence* this is doubly shown by two things: the harp like tree shown in figure 5.6.4, which

is dying and whose trunk is hollow halfway down from the branches. It is made to hold a human. The second are the saplings that were planted, seen in figure 5.6.5 that will hold the musical instruments.

Figure 5.6.5 Planted larch trees in forest.

In material terms I am also drawn to porous things that can pass water, such as tufa stone as well as more earthy materials such as unfired clay and humus. Working with these materials in the ground and with the

roots of the plants is a future activity, but it has to be approached through extensive research because if too many roots are exposed, they die and will lead to the tree dying if exposure is prolonged. Metal pieces, while having an obvious advantage in terms of amplitude are nevertheless problematic from the point of view of safety and maintenance, and as conducting materials can have unexpected reactions from the plants. While the theme of death is present in the work, metal strings can be very sharp and other strings can act as animal traps and this actually killing is not the aim of the work.

Asking what sound the touch of plants makes became an important step towards formulating a way of listening to plants. Interrogating this question forces me to compartmentalize the sounds that can be heard from the plant and to work towards determining which one of the sounds I am hearing is the one made by the plant's touch. While environmental sounds are easily determined, the wind and rain for example, it is harder to say what the growth of plants sounds like without resorting to bio-electric measuring devices or contact microphones and amplification. In order to acoustically amplify the sound of growing plants to hear what that touch sounds like I used a metal tube onto which I carved grooves along the tubes length and then placed it next to a young tree so that when it grows, its leaves, branches, and roots can touch the tube. Figure 5.6.6 shows that when the listening instrument is used the sound is heard by lying down and placing one's ear against the tube so that when the tree moves along the metal its

growth makes a sound against the grooves in the metal and is transferred through contact and proximity to the cochlea.

Figure 5.6.6 Listening to plant growth instrument.

As well as including parts in the instruments underground it is necessary for the instruments to adapt their size to the size of the plants, as they can vary at an immense scale depending on the plant, but also depending on the age of the plant. In order to understand the scale difference, when the first trees I planted started growing I worked with microscopes and cameras to see the minuscule detail what the plants look like and how they touch themselves and each other in their environment. These images can be seen in figure 5.6.7.

Figure 5.6.7 Details of plants and plant touch.

What was an important discovery in relation to the growing of trees is that they grow very fast during their first few months of life. This growth is so fast that it is possible to see it by patiently watching them for a day. In general, plants do not grow consistently but vary according to the season and their age, with the late summer having the highest rate in plants such as Pines, whose maximum growth has been recorded at 3 cm per day, and having their growth slow down the older they get. Connecting this with my pedagogical speculation I started exploring how the touch of plants feels on my body and how the plant has an awareness of, or figures me, as a tactile landscape. To do this I held the plant for a long time in the way shown in figure 5.6.8.

Figure 5.6.8 Feeling the touch of the tree figuring on the skin.

I took this idea of feeling the plants further because plants do not just move, but also react to their environment through other means, such as sending out various chemical substances from their leaves. This enabled me to start thinking about how the mouth can both feel and taste touch and

could be a way forwards to short term collaborations with plants and I experimented with ways of feeling the plant inside the mouth as seen in figure 5.6.9.

Figure 5.6.9 Feeling the touch of the tree figuring inside the mouth.

The fact that plants, or to be specific parts of plants such as the trunk and branches, grow to such different scales while simultaneously the leaves stay the same size poses a serious problem because it implies that instruments must be able to grow and adapt in order to accommodate the moving and growing body without sacrificing the initial resolution that a few leaves can have at the phase where the plant is still very small.

In order to work further with the plants I decided to use one of the remaining trees in the forest to construct a platform on which I could stand in a tree, feel its movement in the wind and rain, its responses to sun and night, as well as touch its branches and body and also let it touch me. This playing platform can be seen being constructed in figure 5.6.9 and it allows me to try musical interpretations with the tree, seen in figure 5.6.10.

Building the platform was drastically different than I imagined. The large harp tree was almost completely hollow and we were forced to fill it with sticks to make it stable for further use. We also decided that the platform I wanted to build for playing should have a handle for balance and the final shape took its course.

Figure 5.6.9 Building the platform on harp shaped tree.

Figure 5.6.10 Playing with the harp shaped tree on the platform.

Due to the location of *Sonic Independence* in the middle east of Finland I have presented this work through the documentation generated throughout the process of making the work. *Sonic Independence* is featured in *CrossSections*, an interdisciplinary platform for artistic research curated by Basak Senova and it was shown twice in Kunsthalle Exnergasse WUK, Vienna. The two iterations of the installation can be seen from figures 5.6.11 to 5.6.15.

Figure 5.6.11 Sonic Independence at CrossSections, 1.

Figure 5.6.12 Sonic Independence at CrossSections, 2.

I have the same feeling with *Sonic Independence* as I do with another work where I am dealing with vegetal matters – that if I am to talk of nature or trees to be specific, I need to be involved with them. Using traffic as a counter example, this means to be in traffic. With trees it seems to mean to be in trees, and as well as exploring how the trees feel, I thought of how the trees could feel me better. Continuing with the documenting of details that could remain invisible to the eye I started filming my interactions with the plants, and below are images from these interactions.

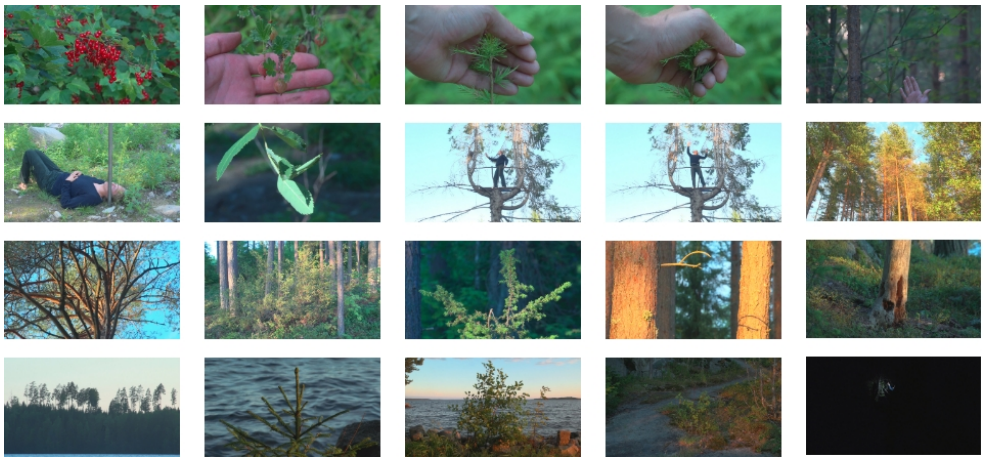

Figure 5.6.12 Screenshots of Sonic Independence video for CrossSections.

In the second public presentation of *Sonic Independence* in WUK Vienna, rather than focus abstract planning materials of the forest, I wanted to draw the attention of the audience to what Stephen Davies calls the instrumental experience and to speculate what that experience could be for plants. Davies' text discusses the intimacy of being and living with instruments rather than merely limiting their sphere to what well-tuned instruments sound like or how perfectly they are used in performance but does not connect this feeling to the aesthetics of music. This is 'because we

see the musical instrument as extending the musician's body and inner life'.[54] In the same way we live and experience plants and there are many connections between music and the forest that I have left unexplored in this thesis. I exemplified this through the use of a citation from James Baldwin's *Go Tell It on a Mountain*:

> [A]nd he fell against a tree, sinking to the ground and clutching the roots of the tree. He had shouted into silence and only silence answered–and yet, when he cried his cry had caused a ringing to the outermost limits of the earth.[55]

In the exhibition I wanted to speculate how plants could extend their bodies and inner life through the instruments I am making and to how these instruments could bring in and include in what is typically perceived as the human sphere of aesthetic activity.

Figure 5.6.13 Sonic Independence at CrossSections: Intervals, 1.

54 Stephen Davies, *Themes In The Philosophy Of Music* (Oxford: Oxford University Press, 2003), p.117.
55 James Baldwin, *Go Tell it on a Mountain* (Corgi Book, 1968).

Figure 5.6.14 Sonic Independence at CrossSections: Intervals, 2.

Figure 5.6.15 Sonic Independence at CrossSections: Intervals, 3.

The work continues in the forest and in the spring of 2019 and in figure 5.6.16 the artist Egle Oddo is shown planting the first trees that were grown inside over the winter. These trees are oaks and it remains to be seen if they can survive the winter temperatures of eastern Finland. This is possible due to climate change, thus at the same time the survival of the

plants above their traditional latitude inserts the work into a discourse about the way in which the forest is changing because of the changing climate. This also shows that the next steps for this project, planned to last until 2099, will be to observe the plants and to start building instruments that can work without impacting the growth or life pattern of the plants.

Figure 5.6.16 Egle Oddo planting oaks at the forest.

5.6.2 Conclusion

This piece interrogates humans' relationship to what the sense of touch can communicate and what touch is perceived to be able to communicate, and further explores how touch and its use as an aesthetic driver can be used to design instruments that mediate plant-human relationships. The instructions of this work are exceedingly simple: grow a forest and teach it how to play music. What to me is rewarding about this project, and also to me proves its worth as an artwork, is that it overlaps the possible and the impossible in a way that the public's reaction to these instruments has never been to immediately denounce the possibility of teaching plants but to demand to know my method of doing it! It then feels like the public is very receptive to the idea that through developing instruments of touch humans can expand their tactile horizons for interspecies communication.

The three phases of the project so far have been to observe, listen to, and touch plants through a touch. In terms of the defined categories by which I have conceptualized my thesis, this is the first work to seriously leave the iterative process and to start developing an artwork which could stand the test of time. In the work, playing and learning instruments are thought of from the point of view that there already is a sound in our environment that is made by plants and we have yet to discover it. Thus whatever is played always accompanies this sound that is yet to be heard. Modifying instruments becomes timely and observable as an action done to acoustic instruments by plants as they move and change, play and build their environment throughout their lives. The plants' environment is then the

instrument, the site where plants can collaborate via music. This gives the piece a deep relationship with time since the touching is seen to happen at the pace of a trees lifespan. This ordering of touch by something else, in a time that is non-human, and in a space which is not completely built or developed but continuously grows, demonstrates how different aspects of letting go, or releasing from the grasp, can emerge in the act of touch-driven aesthetics.

5.7 *Fourteen Times in Touch*

Fourteen Times In Touch is a composition for the feeling of touch where the body itself is the instrument. It wants to present a music that is only available within touch's body of senses and only for the musician touching themselves, in ways that demonstrates how touch is intimate yet communicative, present and at a distance. This piece does not have a traditional performance but asks the reader to perform the music as they read the score. Touch attention, or what I call 'skin-listening', turns the body into what could be considered a silent-voice-body-instrument. The form of the composition consists of three basic sections or actions. The first is to feel, and learn to concentrate on, various feelings of touch within the same spot of the skin. In this part, no noise is made, no movement is made, and yet different and contrasting materials that the skin feels are understood. The second section adds movement, first to the movement attention, whereby several different spots on the skin are listened to, and so that texture and agitation of the body are noticed. The third action is the feeling of the body itself where the action turns in on itself to feel itself feeling. The aim is to develop the attention of the skin so that it is possible to hear all the skin at once and to listen to more than one touch at a single time. The work consists of fourteen text compositions which are presented in the form of a booklet. The texts are meant to be mobile and are not considered fixed descriptions of the music because I want to retain the exploratory feeling to the composition, allowing it to accumulate over time.

As a text based score, it directly references Karlheinz Stockhausen's INTENSITÄT from *Aus den Sieben Tagen*, where feeling the warmth of the universe is the end point of the action. It also makes reference from Edward B. Titchner's *Touch Pyramid*. By listing thirteen types of touch on the skin and eight types of associative feelings of touch, Titchner's model places the body of touch's senses in a relation to each other.[56] Using simple written instructions to help focus the attention on touch and on contrasting the many feelings of touch explores touch as a form of inter-expressive listening in which the listener tries to hear how the sense of touch moves between one feeling and another while being in a strict relation to the specific object that is being touched. Like hearing, touch can be directed through the act of concentration. The piece also clearly presents a meditative aesthetics in the audiences experience of the music because for the audience the person performing the piece will appear still, concentrated on minute things that are felt through the skin and only moving in certain instances, and even then the audience will find it hard to recognize that the composition is being played.

The piece interrogates the way in which Andrew Kania defines music in The Routledge Companion to Philosophy as being recognizable as such when it is heard. He says that '[m]uch of the time most of us can tell whether, and which of, the sounds we are currently hearing are music.'[57] He argues that music must have basic musical features or be listened to in a way as to hear those features. In the definition of music he presents, 'sound' has

56 The model is taken from Martin Grunwald's *Human Haptic Perception*, (originally published in 'Am J Psychol', Vol. 32, 1920), p. 75. The definitions of touch included in the model are: tickle, strain, neutral pressure, prick, ache, dull pressure, heat, drag, clear pain, quick pain, itch, bright pressure, and contact.
57 Andrew Kania, 'Definition', in *The Routledge Companion to Philosophy and Music*, eds. Theodore Gracyk and Andrew Kania (London: Routledge, 2011), 3–13, p.3., p.12, p.6.

been replaced by 'anything intended to be heard'.[58] This line of reasoning about the airborne material of sound being unavailable to all other senses but hearing is in contradistinction to Hermann L. F. Helmholtz who argues that 'the sensation of a musical tone is due to a rapid periodical motion of the sonorous body; the sensation of a noise to non-periodic motions.'[59] Kania's position is more in line with Roger Scruton who argues that music makes use of a particular kind of sound: the acousmatic event, which is heard 'apart from' the everyday physical world, and recognized as the instance of a type. This isolation of the pure sound event leads to a peculiar experience, which I have called the experience of tone.[60] This means that while '[m]usic is the art of sound', in Scruton's terms, 'music is itself a special kind of sound, and not any art of sound is music.'[61] And that '[o]bjects do not have sounds […] they emit sound.[62]' Kania specifically targets hearing as the source of music, while Helmholtz describes the motion of an object, which can be touched in various phases of its existence.

None of these definitions of music give any note to how many people must experience the special sounds. The work *Fourteen Times In Touch* problematizes these interpretation of music because it gives a context in which it is not just one person can hear the music, like when listening to music on the headphones, but the music cannot be experienced beyond the body in which sounds and touches mix and the music is never emitted from the body but always remains inside it.

58 Ibid., p.12.
59 Hermann L. F. Helmholtz, *On the Sensations of Tone as a Physiological Basis for the Theory of Music*, trans. by Alexander J. Ellis (New York: Dover, 1954), p.8.
60 Scruton, *The Aesthetics of Music*, p.19.
61 Ibid., p.16.
62 Ibid., p.2.

An important line of thought present in the work and which was also present in *Sonic Independence* is that the traditional view of the ground and the image switch places. In *Sonic Independence* the plant figures on the human body, which is the ground, while in *Fourteen Times In Touch* the body figures itself on itself as the ground. The body becomes the immovable landscape where figures appear and disappear. This presents clear philosophical problems, and are in contradiction to Merleau-Ponty's thought, who says in *Phenomenology of Perception* that movement is necessary for a 'knowing-touch', and that

> passive touch (such as touch by the inside of the ear or the nose, and in general by parts of the body that are ordinarily covered) hardly present anything more than the state of one's own body to us, and presents us with almost nothing having to do with the object. Even in the most astute parts of our tactile surface, a pressure without any movement presents nothing but barely identifiable phenomena.[63]

Merleau-Ponty argues that tactile qualities such as rough and smooth 'completely disappear if the exploratory movement is removed.'[64] That this can be easily disproved by comparing the feeling of an immobile hand on a rough or smooth surface demonstrates that there is a problem with his argument that the 'tactile background', as Merleau-Ponty calls it, is a 'tactile space without matter', but is rather, living and non-living matter that figures on the body as the ground. To completely critique Merleau-Ponty on this matter is beyond the possible scope of this thesis, but it is a topic, which I would like to develop in my future work.

63 Merleau-Ponty, *Phenomenology of Perception*, trans. by Donald A. Landes (London: Routledge, 2012), pp.328 – 329.
64 Ibid., pp.329.

5.7.1 Practice Diary for *Fourteen Times In Touch*

Throughout my composing of *Fourteen Times In* Touch I developed 'live explorations' similar to the ones created by Nikolaus Gansterer, Emma Cocker, and Mariella Greil in their book Choreo-Graphic Figures.[65] As mentioned in my description of methods, I have called what I developed 'skin-listening' and it is possible to see a deep resemblance between what is termed live explorations and what I have termed building and making instruments, especially in the case of *Fourteen Times In Touch* which presents the body itself as an instrument. 'Skin-listening' aims not only at heightening attention but also at making the transition from not paying attention to paying attention faster and works towards a more refined feeling of touch, which I argue is close to the way in which listening is able to discern multiple elements from a sound. Paying attention to touch is vital to musical performance, where a single wrong stroke can at worst break the authenticity and magic of a performance. Therefore, gathering the senses and getting in touch with the performing body and the instruments to be used in any performance is of vital importance. In paying attention to touch, touch itself is passive and it is the moving gesture and the intention behind that gesture that controls where and what is touched and what the effects of that touch are. In music these touches are called expressions and articulations and they result in sounds.

Paying attention in touch on the other hand is visually static and not based on a movement or gesture that passively feels as the skin moves across a surface. When the attention is brought into the body and into the

65 Gansterer et all. p. 134.

skin, one first notices that touch does not stop when movement stops. The continuous feeling of touch is vital to understanding my arguments of thinking in touch. What brings about this type of attention is to stay with the touch and listen to the dialogue between touch's body of senses. When staying still and not moving the body, the moving attention of the mind becomes apparent. It is mobile and can either stay in one place in the skin, it can move between two different places on the skin, between paying attention to different sensations of touch in a single spot on the skin, or between many spots and their different sensations. I assert that with practice it is possible to pay attention to all the skin at once.

Score

1. Relax, breath steadily but do not concentrate on it, don't close your eyes. Slowly start feeling the tip of your toes on both legs, and move up your shins, legs, sides, arms, hands, shoulders neck, temples and top of the head, then come down through the face, the chest and back, buttocks, thighs, calves, soles of your feet back to the tip of your toes.
2. Repeat this with your eyes closed.
3. Relax, breath steadily and do not close your eyes. Feel the points of skin that are touching different materials. Feel the weight of the body, feel the contact of skin, of a nail, of your trousers, or shirt, how does it effect your skin..

4. Repeat, but categorize the touches and compare different touches: weight, sharpness, roundness, hardness, softness, temperature, transfer of heat, size of area, texture.

5. Touch a material, wait until you recognize that material, feel its hardness, weight, texture, its edges, and temperature, then touch another material. Do this with all the parts and all the skin of the body.

6. Touch one material, wait until you recognize that, feel the weight of your body, feel your skin heating that material,

7. Touch two different materials and do the same.

8. Touch three different materials and do the same.

9. How many materials can you touch and recognize at the same time?

10. Touch a material and stay in the touch. Feel the minute and subtle changes in the touch that lasts until contact is cut.

11. Touch a material and stay in the touch for a while until you feel what it is, then think about touching the rest of your body with that material.

13. Hit something so that the hand bounces of the object and listen to the sound resonating in the space, once it stops, hit it again so that the hand remains on the object and feel the touch as it changes, finally hit something and remain touching only until the resonating echo of the space – stops.

14. Stop what you are doing and close your eyes. Start by feeling the surface of the keyboard with both of your hands. Concentrate on the heat differences between the padded zones in your hands. Always simultaneously, start pushing that heat towards the top of the feet, what in shoes is called the vamp. As you push follow the heat as it builds up your arms and stops at your biceps. Curl your toes so that their nails are pressed by your weight against the floor. Starting from your elbows feel the whole of your back up

to your ears and continue to feel your armpits and insides of the arms then chest and let the heat fall towards your crotch and fill out the rest of your legs. Let the tongue take up spit and feel its heat move towards the tip of your tongue then feel the top of your mouth. From the top of your ears the heat drifts up and over the top of the head. There let the feeling touch itself and dissipate back to the top of the eyelids. Open your eyes and feel the moisture in your eyeballs.

5.7.2 Conclusion

This piece interrogates how the skin can start listening by focusing on the relationship and differences between and inside touch and sound.[66] The piece takes on a self-reflective form and asks the musician to touch themselves as sounding material as well as to touch other materials while focusing on their touch and attention to that touch rather than what the object feels like. Other points of focus are the sound of the touch and how long it takes to feel something compared to how long the sound takes, all while working towards a comprehension of how touch and attention work together. In *Fourteen Times In Touch* I develop a concept of skin or touch listening and the touch resonance, by which I mean how the sound circulates within the body without ever being emitted. Thus by focusing on listening, time, and ordering of touch in different ways, and listening to the resulting sound within the body, the body learns to measure and think in touch.

This piece draws on the work of *Sonic Independence* and other works which de-habituate touch to suggest a pedagogy which isn't primarily

66 In terms of senses this piece is a subcategory in the sense of touch and interrogates how the skin can become a musical instrument.

aimed at children. Some of these methods, like the Carabo-Cone Method, which is specifically described as a sensory-motor method for learning music, explicitly uses touch through games and environments. Abigail McHugh-Grifa, in her The Use of Touch to Facilitate Learning in Music Education identifies seven functions of touching between teacher and child, which she argues are important in learning music. These are '1) to develop positive relationships, 2) to gain a child's attention, 3) to direct a child, 4) to develop audition, 5) to model musical behaviour, 6) to elicit musical response, and 7) to raise body awareness.'[67] My work connects with these pedagogical developments which see touch as a valuable tool in music education in general and for all levels of competence.

67 Abigail McHugh-Grifa, 'The Use of Physical Touch to Facilitate Learning in Music Education', *Visions of Research in Music Education*, 18 (2011).

5.8 *Pickhammeraxe*

Pickhammeraxe explores music as a place for wearable tactile instruments that come in-between the skin and the object being touched. The work consists of four jewel-like composed musical instruments that are used like rings. On the right hand the piece is placed on the thumb, on the left hand on the index finger, the middle finger and the ring finger. These instruments are made from fake leather, wood-bark, string, and silver. To me it seems that P*ickhammeraxe* is a works which aestheticizes the audience's contact with instruments by allowing this relation to gain autonomy and individuality.

Acoustically the instruments amplify the sounds of each touch and even alter the way in which touch between the hand and objects can be made. *Pickhammeraxe* further explores the de-habituation of touch from a musical perspective and asks what touch sounds like by interpreting the tactile habits of everyday life as musical structures. It distances the body's senses from the sounding touch through what could be considered prosthetics, and turns the everyday into a sounding surface by making noticeable the articulation of the environment with a tool.

I compare *Pickhammeraxe* with the piano because, while their scale is different, they both work by inserting objects between the hand and the sounding object in a way that allows the inserted object to become musical. The piano has an enormous amount of research into fingerings and techniques as well as on the relationship of the human touch to the produced sound of the piano where the explicit use of touch is used in conjunction with the desired feeling of sound. For example Marguerite Vasnier describes

Debussy's touch as being 'sonorous, rather percussive, but also sometimes very gently and cantabile.'[68] In another example of Debussy's touch, but in a less admiring but no less obvious way, Aaron Copeland said that 'Debussy's piano style calls for the tempering of touch to the point where the percussion sensation is transmuted into a sort of caressing contact with the key.'[69] Both examples also show how tactile descriptions use abstract terms unrelated to the feeling of touch, which in the case of the piano key, would be smooth and cool, yet both clearly demonstrate the importance of the concept of touch in piano music. This is important because it points to an undeveloped phenomenon in music which has so far focused on the emotional understanding and inscribing of touch and to the listening of incidental and quiet sounds, rather than the understanding and use of cutaneous touch.

In opposition to this, *Pickhammeraxe* uses a mixture of touch and sound whereby the caressing of the hand is not translated into a caressing sound even when that is the intention. The silver hooks and sharp angles simply do not allow for it, and the work mixes the way in which music is spoken about, what sound is emitted, and what it feels like when touch happens. The work, like *Violino-Piccolo* and *Valigia Avvolgente* critiques Peter Kivy's argument that tablature does not contain the music because it does not provide a full picture with which the mind can comprehend the music as mental sounds. In contrast to my previous work, which embraces the non-visual fragmentary notion of touch, I argue that when worn, the parts of *Pickhammeraxe* do give a total, and even inescapable, picture of the

68 Maria Metaxaki,'Considerations for the Pedalling of Debussy's Piano Music', (unpublished doctoral thesis, City University, 2005), p.33.
69 Ibid., p.55.

whole score because the composed musical instrument cannot be avoided until the instrument is taken off and thus even the avoidance of those fingers where the instrument is held becomes part of the musical structure. This image cannot be avoided even when only one part of the whole is worn.

5.8.1 Practice Diary for *Pickhammeraxe*

In P*ickhammeraxe* two of my lines of research combine, the line in which I have followed composing musical notation into physical pieces and parts, separating these parameters into the body of senses, and then working specifically with touch and the parameters available to it to formalize the structure of touch as an organizational principle in music. This is especially audible in the recordings made during my Nordic Art School residency in Kokkola where the sound of making, of sawing wood, clearly emerges from the work – as action – to become rhythmic, but in a way that is a non-functional way in musical terms but is a necessity when making something. (See *Pickhammeraxe* documentation, [01 Pickhammeraxe Working Performance 1.WAV], on the attached pen drive.)

Being in touch with the inter-expression between attention to touch and attention in touch brings about the possibility to de-habituate touch in at least two ways, which I have already talked about. *Pickhammeraxe* starts by observing the way in which people touch their environment and then goes on to illustrated wearable musical instruments that come between those touches. In other words, in order to perform the piece it is only necessary to wear the instrument. Here touch doesn't just signify a fashion statement, it

goes beyond pop references and even prosthetics to the technological extending of the sense of touch in the act of living vis-a-vis an instrument.

I also wanted to explore *Pickhammeraxe* in conjunction with other instruments, and having a piano available in Kokkola I decided to explore its sounds, but also see what it would mean to play Debussy, specifically his *Reflets Dans l'Eau* while wearing the instrument to further distinguish between sound and touch. (See *Pickhammeraxe* documentation, [00_Pickhammeaxe Using on Piano Debussy Caress.mp4], on the attached pen drive.)

Figure 5.8.1 Drawings of wearable instruments.

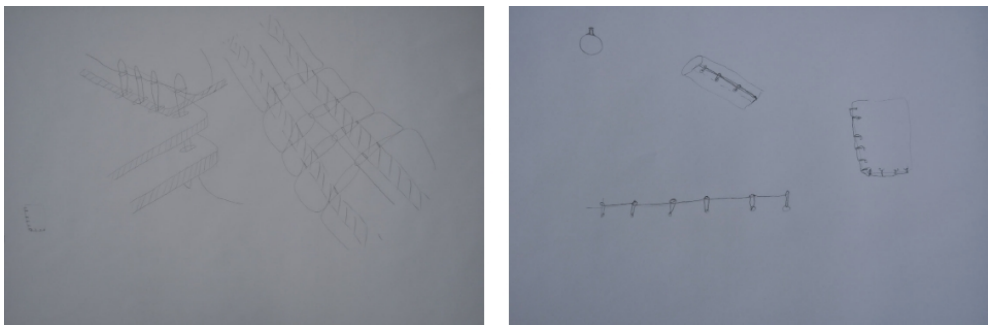

Figure 5.8.2 Drawings of stitchings to be used.

Figure 5.8.1 shows drawings from which I chose number 13/20 (second lowest row, first on the left) and drew it out much larger and then also re-imagined the parts of the instrument given the materials I had at hand as seen in figure 5.8.3. In order to guide this process from the tactile and visual perspective I bought silver, a blue fake leather hand bag, and birch bark. In order to get into the role of making a wearable that looks and feels high quality, I needed to first understand what it meant to work with the materials I had. I had already made a work in silver and was thus familiar with the material. Figure 5.8.5 shows how I took the hand bag and dismantled it intact while paying special attention to the different stitching methods and their application on seven different seam types in order to reproduce them as material memories in *Pickhammeraxe*. Studies of the

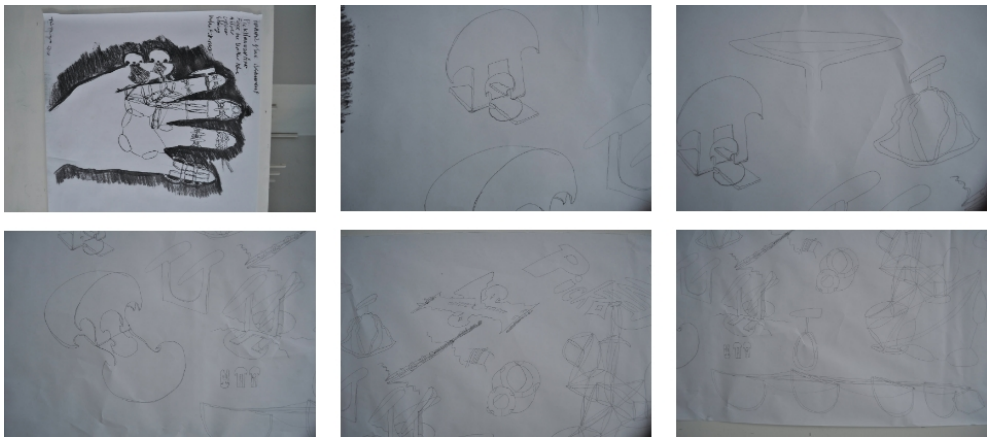

Figure 5.8.3 Drawing of wearable and all parts to be fabricated.

stitches can be seen in figure 5.8.2 and the implementation of the stitches in the work in figure 5.8.6. Thus, the object acted as an archive for various aspects which I necessarily needed in the work. The materials, its human marks, memories and previous function, as well as the marks left by the industrial construction process, were added into the final fabrication of the instrument and became part of the finished composition.

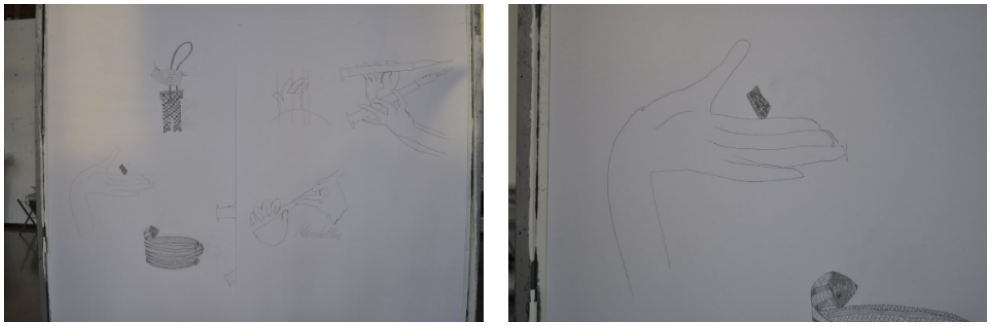

Figure 5.8.4 Studies of wearables and touches.

Figure 5.8.5 Taking apart handbag.

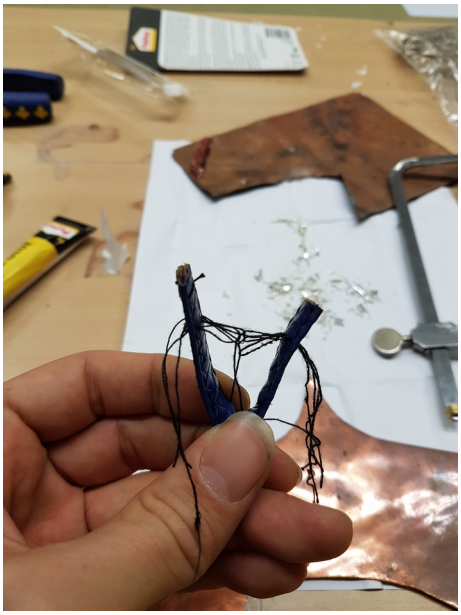

Figure 5.8.6 Using learnt stitchings on instrument part.

In order to create a context by which the audience to my work studio, seen in figures 5.8.9 to 5.812, could understand the de-habituatione

process through which the work was interrogating my questions I began copying illustrations of hands from art history books. Seen in figures 5.8.4 to 5.8.8., what interested me were images of playing music and how touching musical instruments was depicted with flutes and harps. There were other types of touches in the books as well as poses of the hands, like pointing towards the heavens, and frescoe's where a hand touches the first black burnt piece of stone ash falling before the disaster. Or the Egyptian ceremonial hand holding what looks like a decorated glass bead shaker in the shape of a hand bag.

The composed musical instrument I made is made up of four pieces which interrelate the hands so that three are played by the left hand and one by the right. In order to make the instruments I first constructed a jig on which I could easily manipulate the small pieces and strings, as seen in the previous pictures.

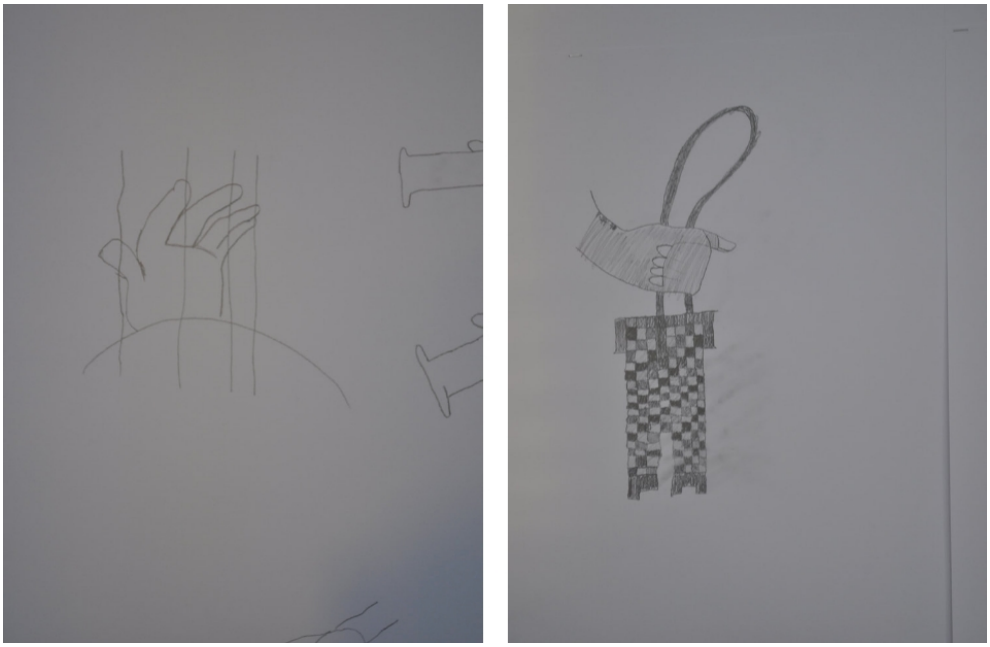

Figure 5.8.7 Studies of touching instruments.


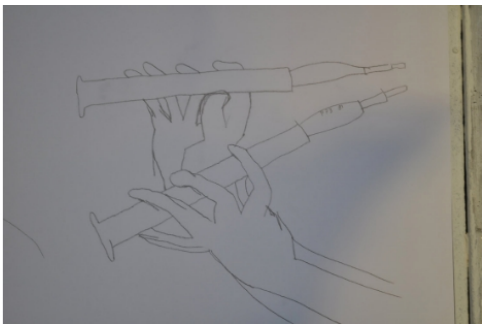

Figure 5.8.8 Studies of touching instruments, 2.

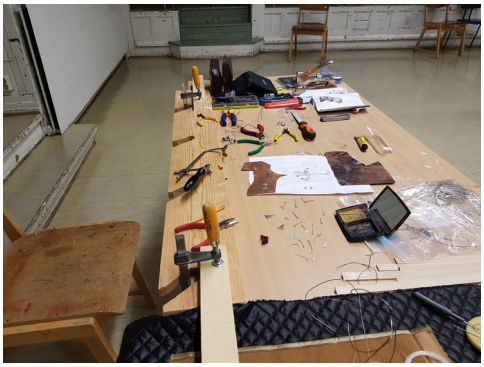

Figure 5.8.9 Work table.

Figure 5.8.10 Horizontal jig.

Figure 5.8.11 Installation space.

The final instruments can be seen in figures 5.8.12 and 5.8.13.

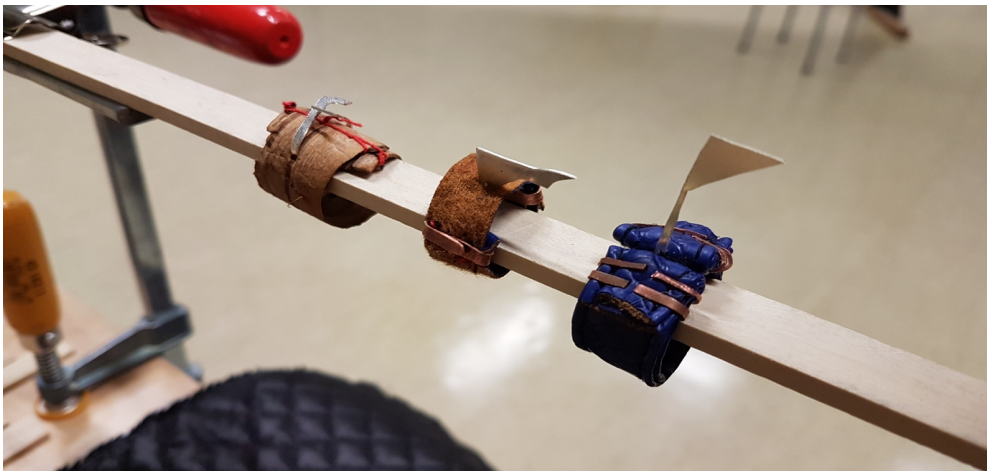

Figure 5.8.12 Three out of four parts of the instruments.

Figure 5.8.13 Pickhammeraxe being used.

5.8.2 Conclusion

The piece interrogates touch when it is in continuous contact with objects and when objects come between the skin and external objects. By demonstrating how touch is transferred by a mediator, it reveals what happens when the skin feels through another object and understands how the resulting music is characterized and formalized by this relationship. This

shows that touch is not an extension of the instrument but an intrinsic part of the body and the way the body plays music.

It would seem intuitive that touch in this sense is reduced, but while the touch's body of senses is in some instances reduced because feelings like heat will take a while before they transfer through the object, others, like sharpness, cannot appear out of a non-material space. Simultaneously it feels like touch is increased because the held object becomes the toucher, and through it not only more touch happens, but touches are de-habituated and strange, bringing more and more attention to touch.[70] As well as mediating the relationship, the new instrument is designed in a way that brings out what is between the skin and the sounding object: stretching, weight, tickle, rubbing, pricking, access of skin to sounding object, and feeling of materials, which are thought of as part of the mix of compositional materials. The action of the musician also demonstrates what I argue throughout my thesis to be the structure of touch as it acts and plays in and with the parameters of musical composition. In this way musical instruments become not just emitters of sounds, but accumulators of the sound of making, building, playing, observing, and admiring as formalistic and structural elements in the music, and existing throughout the sounding life of the instrument.

This structure changes in two ways due to the instrument. First it decreases, as not all the sensations of touch pass from the sounding material through the object to the hand immediately, the object must first take on

70 Texture is a good example. The texture of a bow, for example, becomes the felt objects, its particulars form the feeling when touched, but added to it there will be the texture that which is touched by it.

properties that can be transferred and only then can the touching hand feel them as they are on the target object. This relation can be understood by remembering what the materials feel like and by observing the change that happens over time to the mediating instrument.[71]

Secondly, it increases as the mediating instrument takes on its musical role and the touch becomes more and more mixed between what it feels like and what it sounds like. The clicks and clacks, scrapes and scratches that occur from the touch of the instrument can take on special role in the imagination of the wearer and they can decide to engage in playing with those sounds, as I showed in my Debussy example. This relationship constructs a physical or tactile memory and time in two ways. In that it happens on the skin and the skin itself can remember, and also because the representations coincide in the brain area that deals with three-dimensional thinking and thus with the strange shapes the hand must now take in order to touch familiar objects. This generates new mental representations and changes the way the musician thinks they should touch an object.

71 Alex Honnold at TED2018, 'How I climbed a 3,000-foot vertical cliff – without ropes', <hhttps://www.ted.com/talks/alex_honnold_how_i_climbed_a_3_000_foot_vertical_cliff_without_ropes?language=en> [accessed 23.5.2019]

5.9 *Valigia Avvolgente*

Valigia Avvolgente consists of five wooden boxes that each contain different materials such as piano strings, nylon strings, metal bars, drum skins, metal sheets, a marble toy, and a piano mechanism. Each box, can be seen separately in figure 5.9.1. and each has one or two holes through which the musician can play the instrument inside. The surface of the box can also be played, by either hitting or through different touches. The boxes are designed in a way that they can be put together to form a cube. With this design I wanted to express the idea of an instrument that brings people together – and does it so that when the parts of the instrument come together it is obvious to everyone that this is right. I argue that the instrument is simultaneously the score and its means of production. While the shape of the instrument and its parts was pre-planned, the holes connect with local memories and use shapes that I searched and found during the making process. This is an answer to the problem of getting the audience to touch the instrument, combined with an idea of affordance and guidance towards understanding what to play once touching the instrument. Documentation of the two performances of *Valigia Avvolgente* can be viewed on the pen drive where there are performances by the composer in a solo, and in a duet with

Figure 5.9.1 Valigia Avvolgente in parts.

Dario Lo Cicero, as well as audience interaction and collective playing of the composition. (See the folder in *Valigia Avvolgente* documentation, [02 Valigia Avvolgente Performance Videos], on the attached pen drive.)

With the piece I want to critique Peter Kivy's notion that the existence of notation available to mental sounds means that the composer does not need instruments in order to compose music:

> So powerful is this notation, and so much a surrogate for that which it notates – that is, the work of music itself – that there is a strong temptation to reify the notation and mistake it for the music, […] Be that as it may, once a notation pops in between the composer and his medium, the medium is no longer the transparent thing that it was (and remains) in the world of improvised music. It becomes rather, a problematic concept to be scrutinized with the philosopher's eye.[72]

While there are improvisatory parts in my music, especially where decision making is transferred from the composer to the musician, *Valigia Avvolgente* is not improvisatory or indeterminate, but each sound is composed and the pallet of sounds is limited by the size and shape of holes and their positioning throughout the whole instrument to allow for only certain sounds at certain times to be played. Like the instrument itself, this argues that this is closer to being modular than it is to aleatoric. This is especially clear in the documentation, where one musician is shown playing the instruments so that the cyclical element is revealed in the movement around the instrument from one hole to another. (See *Valigia Avvolgente* documentation, [00 Valigia Avvolgente Baglio Di Stefano Dress Rehearsal.mp4], on the attached pen drive.)

With *Valiga Avvogente* I argue that the material of the composer is not 'the nondimensional medium of music, that is to say, sound', but in a

72 Kivy, *Sound and Semblance*, p.86.

composition working with the relationship inside a mixture of sound and touch is simultaneously dimensional and beyond vision, and that it is precisely these problems arising from music's tangibility that need to be scrutinized.[73] It is this scrutinization that interested me during the composition, how to make the shape of the appearance attractive yet tell a story of the very place it was made in, so that the initial visual engagement is accentuated when the instrument is touched and smelled close up and when it is heard, but continues to add layer upon layer of mixed meanings. Figure 5.9.2 shows how the instrument is placed in the performance space to have this effect.

5.9.1 Practice Diary for *Valigia Avvolgente*

Figure 5.9.2 Rehearsing in Baglio di Stefano.

73 Ibid., p.95.

The composed musical instrument consists of hollow musical bodies filled with a musical identity not characterized by their volumetric acoustics. Rather than being concerned with the materials being used, *Valigia Avvolgente* is a conceptual work that is materialized through research into the local landscape. The idea behind the shape of the work is to do with coming together in a way that is immediately recognizable as being correct. Intuitions played a strong role in working with the symbolism in the work, while interrogating my questions I was forced to recast and solve my question of how I can bring the audience close enough for them to touch the instrument without asking them to do so.

In his essay *Disembodiment: Reproduction, Transcription, and Trace*, Aaron Einbond critiques embodiment for being 'dominated by more literal interpretations of touch.'[74] Einbond's analogy uses an operatic scene where the singers, whose instruments are their voices, are physically absent from view, arguing that these are literal signals to echoes and to absences. What my focus on cutaneous touch reveals is that 'literal' can be interpreted in multiple ways and that the perceptual modality that leads the aesthetic conversation also dominates the interpretation. Touching through a hole to play music is then to me not about absence even when it is hidden, but its opposite. It is about the presence of touch inside, where it comes into contact with the sounding materials. While the final image of the cube was important, I also wanted my *Valigia Avvolgente* to take on modular totemic images and icons in order to be able to contentiously develop the story being

74 Aaron Einbond, 'Dismbodiment: Reproduction, Transcription, and Trace', in *Tempo*, 287 (2019), 83—90, p. 90.

told by the materials. In the context of *Valigia Avvolgen*te it was important to ask this question of literal representation because it deals with historical research and the issue is not only how to make a box, inside which there are musical materials, but how can that historical research be the mould that casts the work and which results in a composed instance.

Figure 5.9.3 Miniature model put together.

Figure 5.9.4 Miniature model as parts.

I started by making a miniature of the instrument so I could start to think about how the players would approach the instrument, these miniatures are shown in figures 5.9.3 to 5.9.6. What was initially important was that each of the five shapes should be different, but that their total sum

would form a cube. Due to time constraints, I chose the first solution I invented to this topological problem, which had only two shapes which were the same shape and size, but which nevertheless felt approachable in terms of technical fabrication in the timeframe I had.

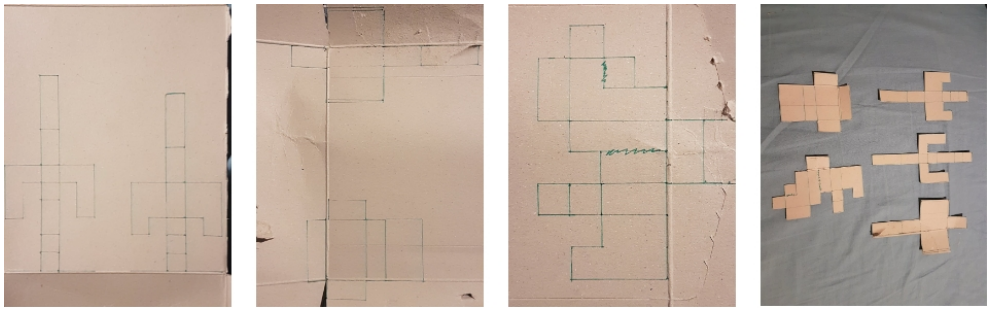

Figure 5.9.5 Miniature model drawing.

The first miniature was constructed from cardboard. Crossing from cardboard to wood I then made the mistake of miscalculating the sides of the wooden pieces to have an interior measure of 20 cm, and which had to be overcome by improvisation and sanding. While an obvious mistake it cannot be discerned from the final instrument.

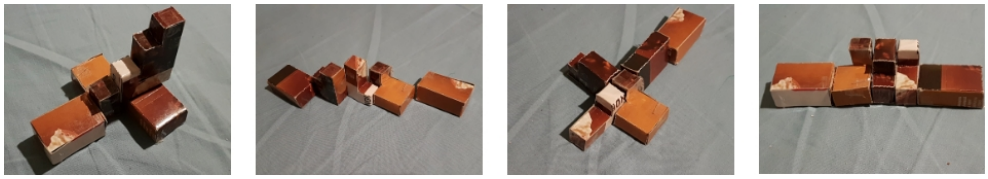

Figure 5.9.6 Miniature model in different arrangements.

I also drew some ideas about how to organize the instrument inside, as seen in figure 5.9.7. These were preparatory sketches I used for myself to try and grasp mentally how the instrument needs to be built from wood. For example, what might be the issues related to its loads and pressures be that I need to be concerned with, and also whether the instrument should be made

so that it could be possible to play one box through another box, which I finally decided against as it became too laborious to find enough good shapes.

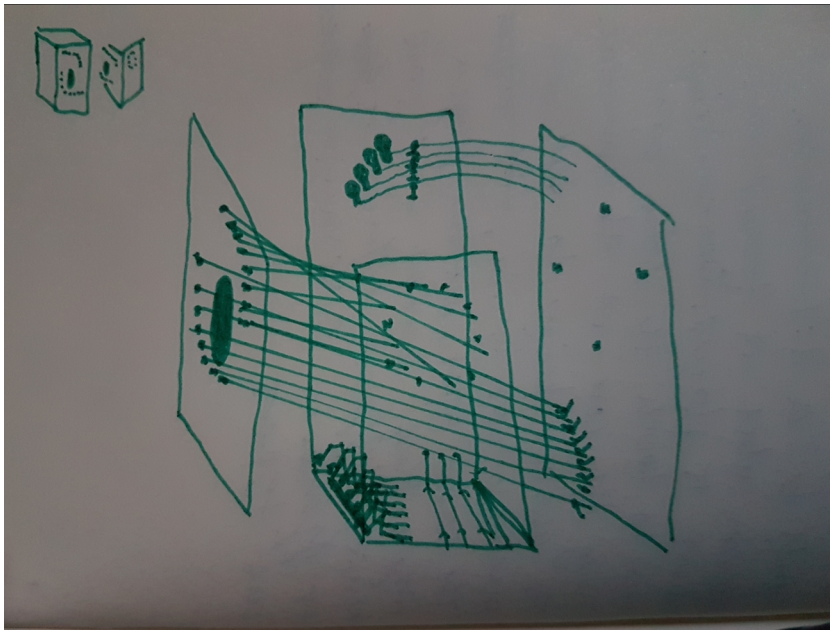

Figure 5.9.7 Drawing of possible interior.

When I got to the studio I decided to explore the feeling of what it means for a shape to wrap around empty space in order to make a resonating body, as I have defined it before in this thesis, and how it felt to be with and work with that developing body whose shape I was discovering and manipulating over time. Before I started to explore this manual practice I began by drawing new shapes of the interior in the location and using ‘reverse perspective’, or intentionally altering perspective for a certain effect, shown in figure 5.9.8, in order to readjust how I thought about the differently shaped blocks interacting within the total shape of the cube and how the eye and the hand moves within that organization or rhythm. The aim was not to redesign everything, but to let go of the mental images I had

accumulated in the process of getting to the point where I was. Thus, by redrawing new shapes that made no sense in terms of their physical properties I began connecting to the local landscape and to the signals I was seeing, hearing, and feeling there.

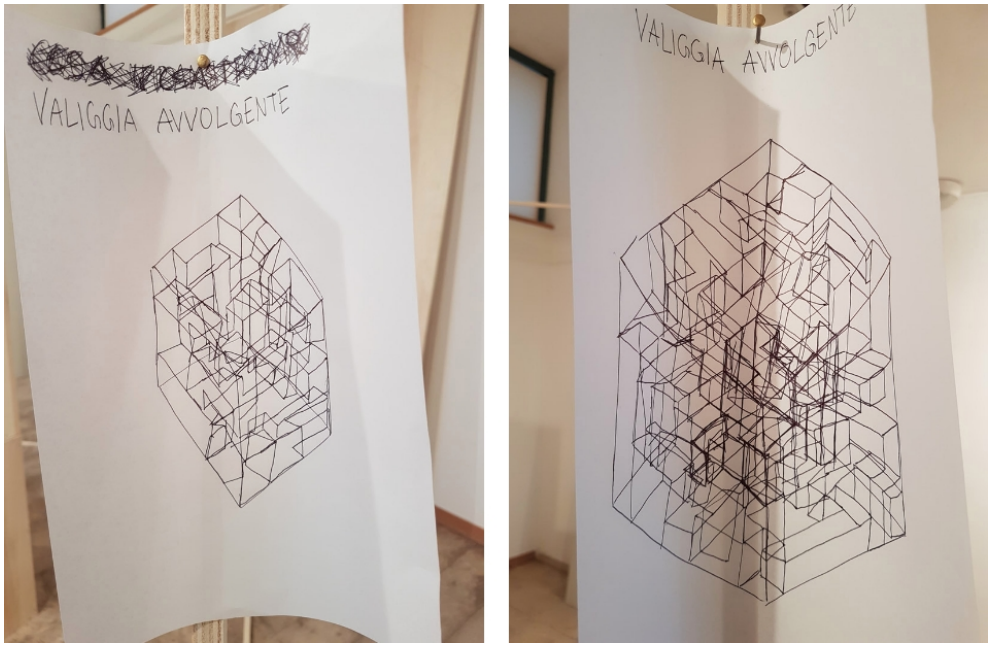

Figure 5.9.8 Drawings of interior "reverse perspective".

During this time I also started working on the problem of communicating the relationship between music and touch so that the toucher would not only understand that they are touching a score but that their touching consists of the instance of the work that speaks about community, social design, labour, crisis and how at a certain historical period in Sicily these came together with contemporary art to drive social change and policy. I think that the knowledge of a musical instrument could be communicated by known musical parts, such as piano mechanics those shown in figure 5.9.9.

Figure 5.9.9 Piano mechanics in circular arrangements.

Going back to my materials I made the exterior from 1.8 cm thick cut plywood and as I started work I felt that the resulting cube should not have a side deeper than 70 cm. These pieces can be seen in figures 5.9.10 and 5.9.11, and the final instrument in figure 5.9.12, where is also visible the lines going around the instrument which move the eyes towards certain parts and with a certain rhythm. These lines consist of the lines between the parts of the instruments' parts, but also of the colour and markings of the wood being used for the instrument.

Figure 5.9.10 Wooden pieces for instruments cut.

Figure 5.9.11 Parts of instruments being constructed.

The process started diverting into abstractions because while the external body of the instrument was ready, without the interior parts I was still waiting. I did not want to make any decisions about the holes and their shapes, but wanted to only decide them after exploring how the materials came together in sound and touch. The research I did in the meantime was geared towards understanding materials and, especially, shapes that held meaning in the local landscape, and to see how they would interact and

Figure 5.9.12 Wooden instrument in shape without holes.

organize when brought in the same space. This can be seen in figures 5.9.13 to 5.9.15, where it is visible how objects from the outside were brought into the working space and how that space began taking a shape which expressed my ideas about the composition. These injections of life into the studio reminded me that by hiding the instruments I didn't want the touch to feel absent, but that the holes should be able to communicate like doors, that they are entrances into worlds that cannot – and more importantly which need not – be imagined.[75]

Figure 5.9.13 Building the interiors.

75 One of the things I was fascinated about during this time of research is the tradition of Karelian locks as discussed by Alfred Kolehmainen in his book *Karjalaiset Vanhat Lukot: Lukkoperinne 2* (Helsinki: WSOY, 1989). These designs also played a role in the making of my *Twang*. In *Valigia Avvolgente* the idea of unlocking the mechanism that can be touched only through a hole and which can be unlocked when touched then played a role in the final outcome of the piece.

Figure 5.9.14 Working space.

In *Haptic Geographies* Mark Paterson discusses the notion that the senses are in the landscape. Rather than start by thinking what I am attracted to in a shape, I studied my landscape as a material archive of returning shapes, these chosen shapes always being, or connected, to holes within the landscape which the hands already knew. These included decorative fences, as seen used in figures 5.9.16 and 5.9.17, an oval water basin, rusted steel

Figure 5.9.15 Working in space.

planting equipment, a bent-out metal shoe scraper next to the entrance to a destroyed building on the promenade of an abandoned city.

Figure 5.9.16 Cut hole.

Figure 5.9.17 Origin of cut hole.

A major influence on the work was the destroyed and abandoned village of Poggioreale, where I noticed many shapes which connected with entrances, but also that there were small pieces of pure Carrera marble in some places, which I started collecting, with the intention of using them inside the instruments as a local material. Still lacking the content for my instrument, I let my imagination move freely in the landscape and began imagining textural abstractions of the idea of coming together, and of the cube, first by constructing a big frame of a cube inside which I could work.

Once my materials arrived I began constructing the interior of the instrument, seen in figures 5.9.18 and 5.9.19. The tactile shape starts to take on various directions of sonic explorations meant to fill out the empty cavity of the boxes. I wanted the final solution to come from the tactile process of

working in relation to the materials I had and the place I was in, and this is seen in figure 5.9.20 and 5.9.25 where the working space is shown.

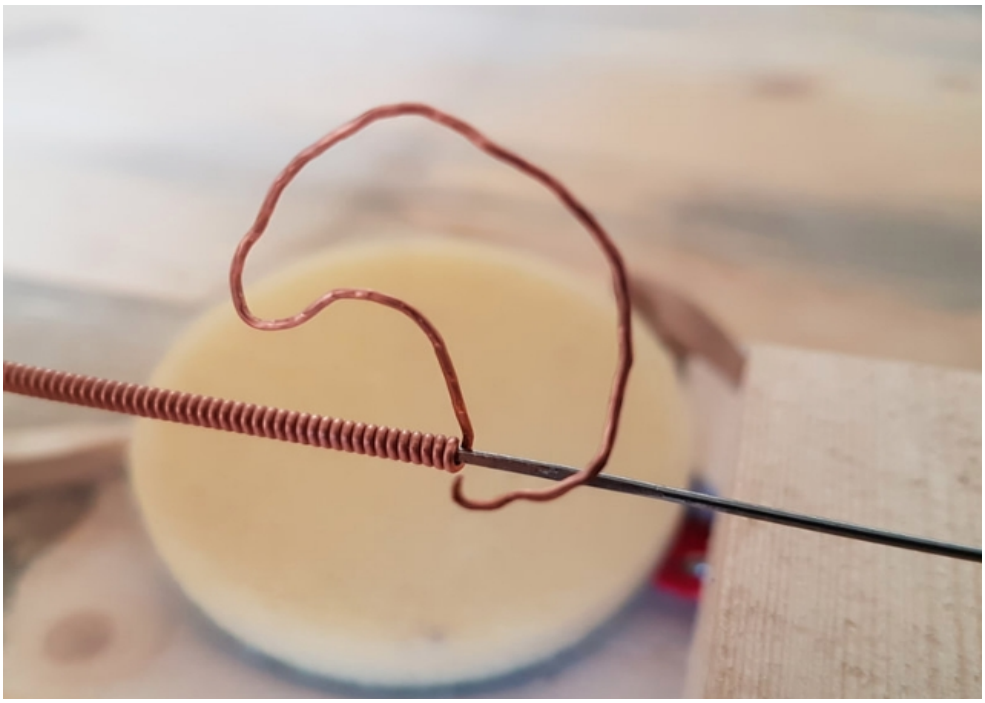

Figure 5.9.18 Making instrument interiors, 1.

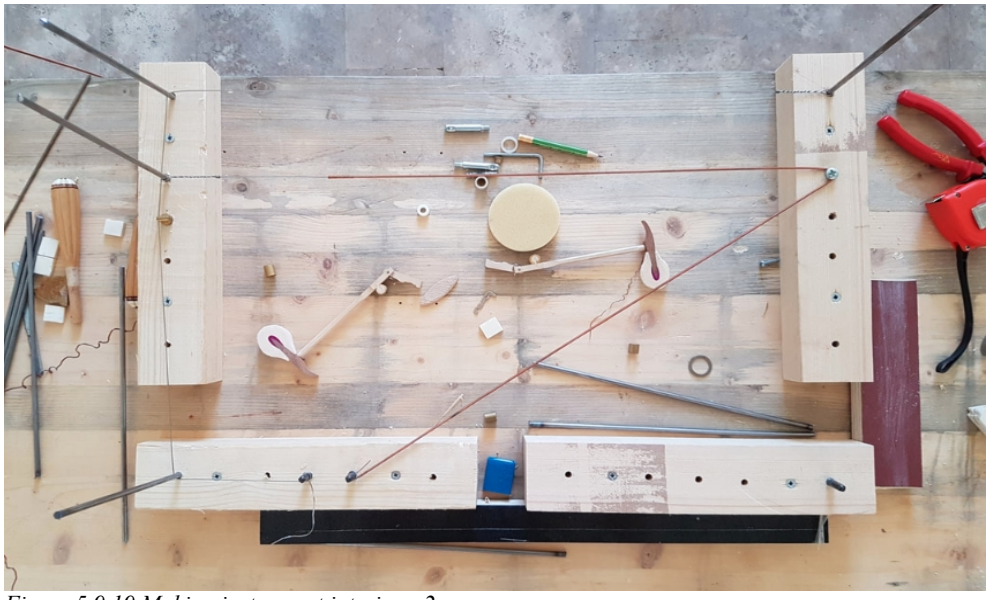

Figure 5.9.19 Making instrument interiors, 2.

Working like this, the space I was in and the space I was imagining both equally started to fill up and saturate with shapes, colours, materials, and sounding objects.

Figure 5.9.20 Working space.

In saturating the space with symbols, I was able to come to a decision for the shape of the holes, and I drew out my decision using a three-dimensional template of ink where I could experiment with symbols and hole shapes as seen in figure 5.9.21.

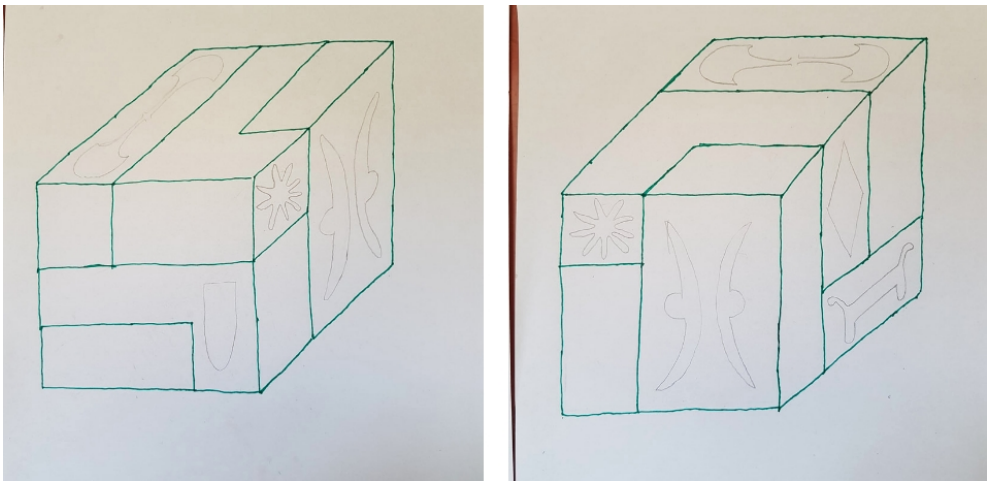

Figure 5.9.21 Final hole design.

The final cuts are seen in figures 5.9.22 to 5.9.24 before work started on the internal parts. Here it is already visible that the instruments also started to work as a symbol for an organization of the interior musical materials. I started asking questions like, '[I]f I am touching here, what is reachable and for how long is it comfortable, and where do I feel like moving?'.

Figure 5.9.22 Instrument with holes cut out, 1.

Figure 5.9.23 Instrument with holes cut out, 2.

Figure 5.9.24 Instrument with holes cut out, 3.

At this point, once I had finished working the edges of the holes and sanding the instruments, I knew that I had discovered the haptic-visual signs needed to bring the audience close to and enter the instrument without asking them to do so, but I was still perplexed over how the interior of the instrument would yield a recognizable musical pattern for touch only. Another reason for this step back was my surprise at the ergonomics which I encountered after finishing the exterior. Kneeling, sitting, bending over, all

these positions and poses that the body took in order to reach inside became apparent, and yet I still felt like there was something that I didn't know. I decided to take a step back and explore more of the landscape and the people there, observing their touch and the traces of their touch in more detail.

Figure 5.9.25 Building instrument interior.

As I explored the landscape, both the rural hills and the urban spaces I felt more and more that while much of it was derelict and abandoned, it was not empty. This feeling of a presence within the landscape led me to formulate a line of verse, which then turned into a melody used in the final performance of *Valigia Avvolgente*: 'Nel suone nel vuoto, non era la, mi guarda e ascolta, non era la.' In other words, 'the sound of emptiness is not here, I looked and I listened, it is not here.' During this time Antti Ahonen and I further explored this lack of emptiness in the landscape by sleeping overnight in the town square of Poggioreale.

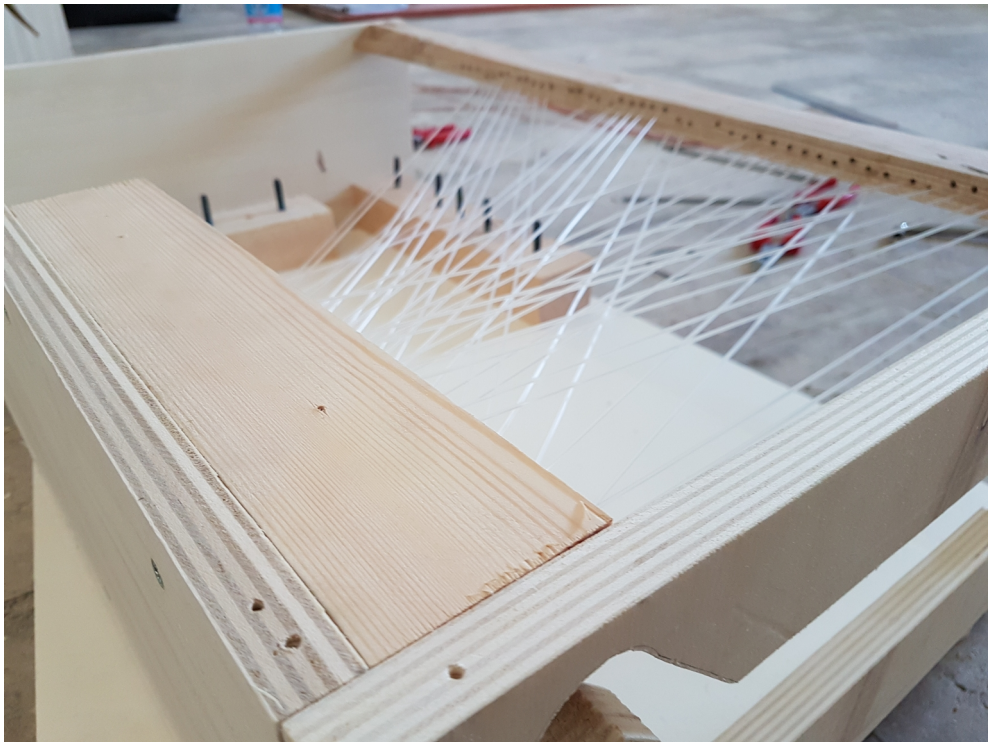

Figure 5.9.26 Building instrument interior, 2.

The intuitive reflection I was doing helped me refocus, and I started exploring the tactile feelings through the materials I had available. Figures 5.9.26 to 5.9.28 show interior parts of the composed musical instrument,

and figure 5.9.29 shows an image of how the instrument is accessed and used, and figure 5.9.30 shows Salvatore Zummo playing a unit of the instrument.

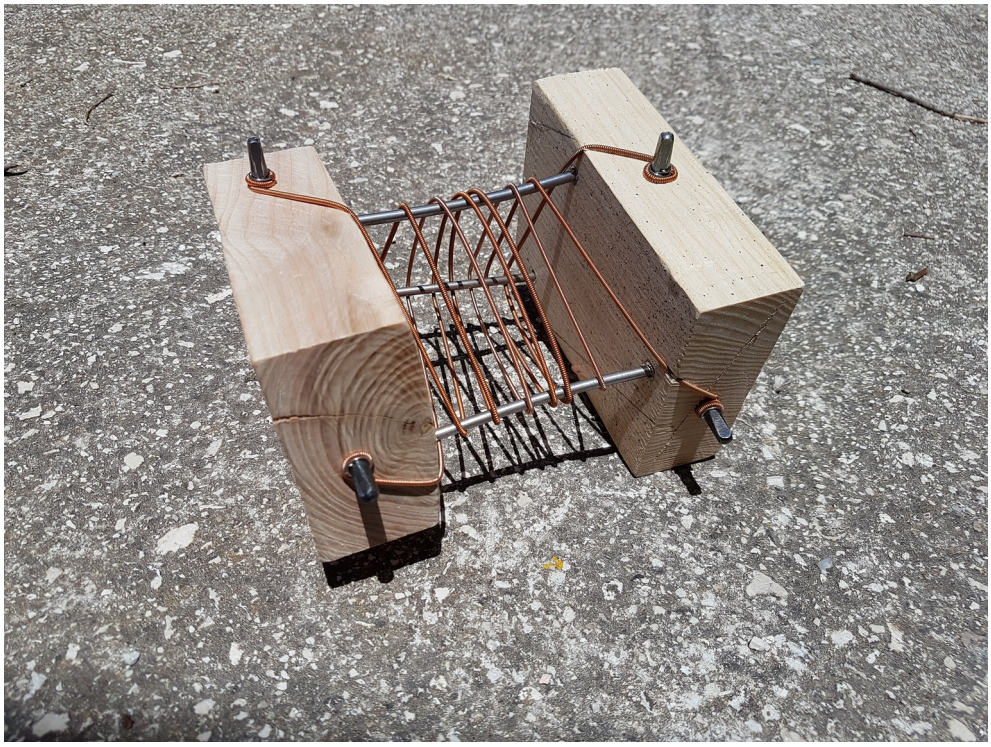

Figure 5.9.27 Building instrument interior, 3.

Figure 5.9.28 Building instrument interior, 4.

Figure 5.9.29 Playing instrument interior.

Figure 5.9.30 Salvatore Zummo playing one piece of the instrument.

Seen in figure 5.9.31 is the first performance of V*aligia Avvolgente* as a solo piece, in Baglio di Stefano, a large converted exhibition space of the Museo delle Trame Medirreanee in Gibellina during the opening of our group exhibition *Growing a Language*. It makes clear how the poses and body positions help the symbolism of the work. Figure 5.9.32 shows the performance of *Valigia Avvolgente* as a duo with Dario Lo Cicero, at the opening of our exhibition *Il Traffico* at Manifesta12 Palermo. From this it is clear that the symbolism of the work changes with the number of people playing as well as with the location the work is in. In Baglio di Stefano the work is intimate while communicative because the soft touches are amplified in the echoing space. The composed-musical-instrument is not assembled in performance but is played on as a stationary object around

which I perform. While in Manifesta12 the piece takes on a quicker form and the making of sense of the process of assembling the work takes centre stage. During both exhibitions the work was placed so that the audience could play with the instrument and interact with me after the solo performance. (see *Valigia Avvolgente* documentation, [00 Valigia Avvolgente Audience playing in Museo delle Trame Medirranee_1.WAV])

Figure 5.9.31 Performing Valigia Avvolgente in Baglio di Stefano.

Figure 5.9.32 Performing Valigia Avvolgente with Dario Lo Cicero at Manifesta12.

5.9.2 Conclusion

This piece interrogates the problem of a priori knowledge, or how the unknown becomes known, and presence in touch as well as the problem of how to know one is touching a musical score, while also demonstrating how the composer needs an instrument to exist in order to compose music for it. What I have done, similar to *Heel*, is to combine several senses in the piece's production, the sight or seeing touch is taken away, but what in fact happens is that the location of sight and touch is changed from the hand that makes the sound to other parts of the body. Touch is made invisible to the eyes as the hand enters the instrument, and this causes the activation of other senses.

The piece writes in touch and touching by using different materials, iron, marble, wood, skin, felt, copper, and nylon. All these materials feel different, but they also produce different touches by being tight or loose, and this must be discovered as there is no way of knowing it beforehand. Some of the sonic objects inside have a resonant reaction to touch, some a more mechanical one and some have textures. Others force, by their arrangement, the movement of the hand to become strange and multidimensional, and some resemble noisy toys rather than instruments in their function.

The holes by which the hand enters are shaped by definitive and different shapes that afford certain movements. Some holes only allow the fingers to enter, while others may allow a small hand to enter but not a large one. The work also explores how the modularity of an instrument impacts the sounding composition. The instrument has the ability to take on several

different shapes and arrangements, and can therefore change the order of feelings possible by changing how the sounds are reached by arranging the instrument during performance. The piece can be performed by one musician or many musicians and separated. Thus, sculptural and choreographical elements and thinking are included in the playing and arranging the playing of the instrument and its touch. This piece is the most comprehensive in terms of categories; it explicitly uses traditional musical materials such as strings and piano keyboard mechanisms, but introduces other material such as marble to change what musical materials feel like, how they are touched and where they are touched, for example by exposing the keyboard mechanism and turning it sideways, leaving out the keys and the strings and retaining the hammers and the hammer mechanism with its fabrics and wood for the touch. This combination of modifying and building connected with a process of sonic exploration leads the hands to start thinking in touch about sound in a way that strikes at the problem of what it means to have a priori knowledge of touch.

Chapter 6

Reflection

I think there are two main reasons why I have embarked on working in a musical style which is highly impractical in an increasingly digitizing society. The first is the desire for a music that unifies all the senses through a single work of art. The second is a desire for a music that not only moves and touches its audience emotionally but one in which the audience acts or enacts the music themselves so that they are not only led by their hands or the hands of the musicians or conductor, but are led by their feet, their knees, and their whole body into playing the music, which partially is available to them alone.[76] In this way what I become interested in while working on my project is the sounding structure of people's actions in relation to the objects they handle, and the utilization of what can only be called a collective muscle memory because it emerges from the shape of the human body itself.

In hindsight I set out too loosely to investigate what touch was, to really get a grasp of my research questions, and perhaps for this reason they evaded me for a time, but also a reason why I was able to approach them without using my sense of vision. When I started my research I had just read Jaques Derrida's *On Touching – Jean-Luc Nancy* and was very influenced

76 Elias Canetti, *Crowds and Power*, trans. by Carol Stewart (New York: Continuum, 1981), p.395–396.

by it.[77] I was even more influenced by Sarah Ahmed's and Jackie Stacey's *Thinking Through the Skin*.[78] Looking back I seem to have wanted to understand how and what action was embodied in the skill of playing music.

As I divided the body of knowledge I was writing about, and I felt attracted to the idea of division because I find numbers beautiful, and aside from numbers not many things divide without violence, what constantly bubbled out from my process was an expanding list of categories and sub-categories of musical decisions and areas where decisions were being made, which helped me parametrize touch as a musical component. This change towards a more systematic understanding of touch, while less significant, initially changed the music I was composing at a later date, especially noticeable in *Pickhammeraxe.* In it, the small, wearable instruments reveal how including touch swipes over materials and shapes, rather than over time, and that these materials and shapes are touches in a non-linear way, controlled not by musical but by tactile reason. Thus, it feels that touch never has to be unified into one whole, but it divides by constituents of its body of senses the multiple complete and fragmented materials and shapes in space and in their places, willingly and naturally.

Reflecting back, I can now see that what in fact changed my music the most was when I started seriously researching archives for other artworks I was producing at the time and which in my thesis culminated in *Sonic Independence*. This synthesis of research as a core practice of my

77 Jacques Derrida, *On Touching – Jean-Luc Nancy*, trans. by Christine Irazarry (Stanford: Stanford University Press, 2005).
78 Sarah Ahmed and Jackie Stacey, eds., *Thinking Through The Skin* (London: Routledge, 2001).

artistic work became a school for learning how to listen to, watch, and access primary musical archives, and to consider how to store and maintain the composed musical instruments in my portfolio as real objects that needed proper care. Reflecting back on the work inside my thesis the change in music are clear. Discourse and explanation of music moves away from sounding description and changes into tactile demonstration and exploration of sounding shapes, textures and resonating volumes. Musical instruments become tailor-made for individual bodies and architectural sites by taking into consideration, engaging with, and disrupting the technical skill of that particular musician. The score in music stops being a singularly imaginable picture but is completely externalized, material, becoming a fragmented assemblage of tangible forms which have the same properties and characteristics as the musical instance. Musical organization changes from being entirely imagined, to being a mixture of the imagined with the real, yet always adhering to what is physically possible for materials and the human body. Time is no longer written on a flat surface but changes to the tactile mapping of topologies and the timely manipulation of materials through cutaneous contact. In other words, the duration of an event is only counted after the event has happened, and even then it is unnecessary. Performance of a composition stops being stage oriented and begins at the first sound of making the composed musical instrument. The last of the changes I can reflect upon in music through my research is the disappearance of silence. A key component of music so far, silence stops being necessary, and listening can be done with the skin. Thus, when touch

has communicative value in music its inclusion creates a semantic sign system that changes the experience of music into one where touch is not just always present but one where touch becomes a necessary component in the experience of the music itself, the musical experience, and instance of a musical work. Looking back at the pieces it can then be seen that these changes are visible, but also that these changes emerge more clearly when the pieces are in relation to each other.

Fourteen Times In Touch serves as an introduction to the concepts of touch attention or skin-listening and the touch's body of senses from the point of view of a silent-voice-instrument.[79] It consists of fourteen text compositions written down in a booklet. These compositions ask the musician to perform certain touches and to pay attention to certain things in those touches.

Pickhammeraxe distances the body's senses from the sounding touch through prosthetics and turns the everyday into a sounding surface by making noticeable the articulation of the environment with a tool. It consists of four jewel-like instruments that are used like rings on the thumb, the index finger, the middle finger and the ring finger. To me it seems that *Pickhammeraxe* is the beginning of a series of works where my audience, more or less, by coming to contact with my instruments become objects but also gain autonomy or individuality with the instrument.

Violino-Piccolo extracts a single instrument from the body of music and exscribes the instrumental body out of this body, in order to approach music from the distance. It consists of three material copies of the ¼ size

79 This means that the natural instrument of the body, the voice, is silent.

violin. Each copy is made from different materials: paper, cardboard, and wood, and while looking the same they all sound and play differently from each other and from the original.

Heel opposes *Violino-Piccolo*, it looks at the details during the moment when touch is extended at the beginning, and how the body of touch's senses disperses notation and mixes perceptions available for representation. It consists of three notational parts of a single action or fingering on the Paetzold. This fingering includes touching the instrument with the heel: a graphic score which illustrates the feeling on the heel when touching the instrument; a metal tool that can be used to simulate the feeling of touching the hole of the instrument with the heel; and a copy of the instrument itself which acts as a notation of the composition as metaphor.

The Land Singing takes a new start and looks at how the body of music and the body of touch can result in a music that is not bound to humans but that can also include the touch of plants. This piece consists one wooden sound board that hangs by guitar strings that form large canvas resonators installed on the ceiling as well as other string and wind instruments. On top of the soundboards are placed ceramic vases which contain plants.

Twang & Twang II: Seeding Tonality take the string and extends its scale to alter its relations to the body and movement. So far, this piece has two instances. *Twang* consists of a twelve-meter-long piano string and two wooden parts, a bridge and a tuning peg which is designed to wrap around a corner and which has a specially designed harmonic bridge that touches the

string when it vibrates giving it a longitudinal signal as well as a latitudinal vibration. *Twang II: Seeding Tonality* consists of a twenty-two-meter-long piano string that is strung through two holes in walls in an abandoned theatre. The string is placed over a concrete hand rail and can be fingered on this rail or can be bridged with a sound board.

Sonic Independence alters music's body completely and interrogates the sound that a plants touch makes, and whether humans and plants share something communicative in the body of touch's senses when they are engaged in music. It consists of an area of eight to ten ares and currently of one hundred and fifty trees. Its instruments consist of types where the musician can touch the trees and where the trees can touch humans and where both can alone or together touch instruments. The instruments act by remaking themselves all the time as do the plants. Growing the players and the material is again the same duality as in *Pickhammeraxe* – of objectifying the audience while giving it independence.

Valigia Avvolgente synthesizes all of the ideas I have worked with and combines touch's body with music's body so that the music and touch are represented by themselves as an instrumental body that affords its music only through touch, tactile, and haptic representations. It consists of five wooden boxes that each contain different materials such as piano strings, nylon strings, metal bars, drum skins, metal sheets, marble toys, and a piano mechanism. Each box has one or two holes through which the musician can play the instrument inside, and the surface of the box can be played by either hitting, or by different touches.

Another important research aspect in the presence of touch is that the public appears as the instrument starts to exist. This way the single person making the instrument is the first musician and audience to the instrument's music. While the decision to sound the instrument can occur in many places, from selecting the living tree in a forest, to unpacking a delivery of wood from a mill, maintaining that the music only starts when the physical object starts becoming the musical instrument means that there is insurmountable divide between theory and practice, between thinking and doing, which when verbalized and notated is also form of mixed signals, as if they had a difference similar to the one between sound and touch. Rather than seeing this as a problem, I think this places my practice-led research in that grey area between praxis and poesis described by Aristotle in *De Anima*.[80]

The lens I want to put to my work talks about growth, but it is distinctly not generative because it is not developmental and is controlled through care rather than will. Not only do compositions with live beings pose a problem about storing and maintaining compositions, but from a strictly urban perspective instruments based on traditional materials such as wood and skin pose equally problematic questions about maintenance. Speaking from the scale of infrastructure, instruments that are larger and embody their places seamlessly are more likely to be allowed to crumble in peace. Like Harry Partche's instruments, as well as the instruments of Walter Smetak, they need to be made in a way that attracts people to them, rather than having the need to move the instruments. From the rural

80 Ronald Polansky, *Aristotle's De* Anima (London: Cambridge University Press, 2007), p. 16.

perspective only a well-maintained garden will be allowed to thrive, and it is this that attracts the most people.

I think talking about growing a research is apt for talking about composed musical instruments that primarily function in the sense of touch. Because unless it were asserted that plants can see through their photosynthetic leaves, the actions of plants are always extending their reach by feeling around. This action is not a random movement, but the plant knows that a body part of touch is waiting to be recognized and it can feel where it is going: the coolness and wetness of water and its flow is felt at a distance. Thus, feeling music through the inter-expressing relations of touch's body of senses leads to an inclusion rather than an extension of music with touch, even, or especially, when it can be said that touch can sense at a distance.

To me, growing a research feels like a methodological book or archive I have not started filling but which extrudes my skin further and further into the world. While growing, the research has roots, trunk and branches, its leaves come and go, maintaining a connection between the highest spot on the tree with the lowest, most deep underground spot on the tree because the leaves are free to be blown away.

Conclusion

In my research I have sought to determine how my practice of music as a mixture between sound and touch is organized, notated, communicated, listened to, and experienced. I am also concerned with what it sounds like. While I have no intention of claiming my definition is better, I do argue that the phenomena I am describing is significantly different to the way music has been defined so far by music's philosophy. Through my work I want to change the attitudes of previous philosophers and theorists who have marginalized and even excluded touch from music, and show that touch isn't merely a novel technique through which to extend instrumental techniques, nor merely a way of including other forms of art into music, but is an important and intrinsic part of music itself that deserves its place as a fundamental aspect of what music is, and which can help it grow and revitalize itself in these changing times.

In a conscious effort I have really wanted to go against the pervading body of research into musical haptics which focuses on digital technology, and in a hope to inspire much more research into acoustic musical instruments as the great tools of human and even non-human expression that they are. While rejecting haptics as it is, I find it interesting to look at existing ideas that circulate in electronic music and then try and find a way that these ideas make sense in acoustic music.

Artistically I have tried to take the logic of touch to its conclusion by also asking also other species, such as plants, to participate in human music-

making. While this is a story in and of itself, I feel that the lowest and basest sense has been given a bad name, even when it has been discovered in music and gaming. I argue that the problems in haptics are precisely because the nature of touch is not explored, and everything focuses on instrumentalizing vibrations, a well-known musical element, in a way that excludes the rest of the senses of touch.

My portfolio of original works consists of eight works which all begin from the making of a musical instrument. In general, the pieces suggest an aesthetic of presence, individuality, and modalities which are simultaneously experienced in a tangible place. Following the argument that the body, when it comes into contact with the musical instrument, becomes a *cassa di risonanza*, where the instrument figures on the skin as much as the skin plays the instrument. A musical analogy would be to say that the body becomes a *sordino* for the instrument and as the audience amasses to the instrument they change it's timbre with their touch.

The Aesthetic of Realism

By placing the start of the instance of music at the first strike in the making of the instrument my work aestheticizes the sounds of work and includes this whole procedure in the body of music. In this way the music never needs to stop sounding like building, something that can be heard especially in *Valigia Avvolgente*, and again, but in a different way, in *Pickhammeraxe*, where the sound of the instrument interacting between the body and the phone is heard as scrapes and hits that sound like fiddling rather than

rhythms. (See *Pickhammeraxe* documentation, [00 Pickhammeraxe Touching Camera 2.mp4], on the attached pen drive.) The drone in *Heel* sounds like work in that it sounds like the high pitched droning of a construction machine such as an industrial hoover. In each of its instances *Valigia Avvolgente* sounds like working, and its form also makes the performance about physically putting the pieces together in an action. While there are pitched strings, most players are not drawn to playing them in melodies but strum either one or many. There is a clank and a hustle-and-bustle when it is played, and other sounds, related to the context, can be heard from the performances. *Pickhammeraxe* on the other hand leads first to working, dismantling, and putting together of materials. The sound of work is the sound of the first part of the composition performed alone, the second part is wearing the instrument while interacting with material interfaces we work with in music and in society. *The land singing* was the soundtrack to a larger performance where we gave away local seed cultivars and worked as agricultural developers and evangelicals. In *Twang* there appears in the work the shape of the axe and the work is installed in the environment of office work. This is also alluded in *Pickhammeraxe*, and it is a shape by which I link my work to a historical tradition of eastern Finnish metallurgy. In *Twang II: Seeding tonality* the work was about discovering construction materials to use as parts in the composition, and of embodying a DIY attitude for public intervention as a musical style. It is also in an environment of unfinished work and a theatre which will hopefully one day work. While it was not a direction I wished to explore in this body of work,

Fourteen times In Touch refers to touch's relationship to public healthcare. *Violino-piccolo* thoughtfully combines the work of the violin luthier and the violinist. In *Sonic Independence* I am attempting to find a way to discourse with the labour of forestry and with the theme of the industrialized countryside, and, more importantly, I want it to speak to the forest owning working class.

Communal Aesthetics

In my thesis I have argued that touch is fragmented and it aestheticizes presence. For me this connects strongly with the orchestral tradition in the body of music where bodies, human and instrumental, come together to form a single piece of music and act out polyphonic musical compositions. In this I follow the line of argument by Theodor Adorno, who says that the orchestras historical origin remains palpably implied long after music has broken from any collective practices. He argues that polyphonic music says "we" even when it lives uniquely in the imagination of the composer without ever reaching another living person. But the ideal collectivity that music still carries in itself, though separated from the empirical collectivity, enters into conflict with music's inevitable social isolation and with the expressive character that is imposed on it by this isolation. The quality of "being heard by many" underlies music's objectivation, and when music's being heard is obstructed, the objectivation is necessarily degraded almost to something feigned, to the arrogance of the aesthetic subject who says "we" whereas it is still only an "I", and is indeed actually unable to say anything

at all without also positing a "we."[81] By creating musical instruments that bring people together in a single activity I have sought to connect my music with the collective origin of music. Especially because of this connection to the group, it is important to note the argument of the collective origin is the myth of music, the interruption of which can be seen in the institutional location of the orchestra. Its organisational structure is rigid, hierarchical, and integrally related to money and political power. By this I mean that the orchestral community, if it in fact has ever functioned as Adorno suggested, has failed its original social function in participating in the structural myth of society. In Nancy's terms, '[t]his is what constitutes the interruption: "myth" is cut off from its own meaning, on its own meaning, by its own meaning. If it even still has a proper meaning.'[82] This hierarchical and rigid structure of power is precisely that which my body of works aim at dismissing by creating an orchestra, or ensemble, that is more like a dynamic network 'acquiring and losing nodes and ties, developing and reconfiguring clusters all the time'.[83] This arises on my part through the influence of Antonio Negri, and his concept of multitude: what emerges from this is a self-organising network community which comes to points to be in the presence of music.[84]

---

81 Theodor W. Adorno, *Philosophy Of New Music*, trans. by Robert Hullot-Kentor (Minneapolis: University of Minnesota Press, 2006), p.18.
82 Nancy, *The Inoperative Community*, ed. by Peter Connor, trans. by Peter Connor and Lisa Garbus, Michael Holland and Simona Sawhey (Oxford: University of Minnesota Press, 1991), p.52.
83 Rodrigo Nunes, *Organisation of the Organisationless: Collective Action After Networks* (PML Books, 2014)
<http://www.metamute.org/sites/www.metamute.org/files/pml/Organisation-of-the-Organisationless.pdf> [accessed: 15 November 2016].
84 Michael Hardt and Antonio Negri, *Multitude: War and Democracy in the Age of Empire* (New York: Penguin, 2004).

In my works I create instruments specifically designed to interrupt the tactile habits of an individual. I use the aesthetics of presence to cut orchestral members off from the structural myth of society, while the instruments act as the blade in this process, to produce what I would call a '[l]anguage […] out of dispersion'.[85] The individual stops being the mythical individual in society and remembers the music through the instruments and their agency to interrupt and de-habituate themselves and each other. They become the individual musician touching the edge of the instrument. Even when they have never used a bow they knows what to do with it without explanation.

Modular Aesthetics

The use of 'modular aesthetics' is somewhat a misnomer because I do not refer to the use of musical melodies or existing compositions in music but the manipulating and arranging physical objects which are designed so that their shape in the physical space can be changed and that this manipulation changes the structure of the played music. To me this is closer to gardening, where plants are organized, shifted, moved and planted according to their needs, while keeping in mind the general aesthetics of the whole garden that is connected to 'the organizational complex', which 'charts architecture's immanence within a network of networks'.[86] This same movement is again seen in operational landscapes, and especially in military doctrine, which

85 Jacques Derrida, *Of Grammatology*, trans. by Gayatri Chkravorty Spivak (London: The Johns Hopkins University Press, 1997), p.232.
86 Reinhold Martin, *The Organizational Complex: Architecture, Media, and Corporate Space* (London: MIT Press, 2003), p.3.

sees the urban space as a modular landscape that can be reformed according to the doctrinal needs of the military in shaping the theatre of operations.[87]

From this view the instruments are seen as mobile and modular shapes where each piece has not only its special individuality but which together form a unit. This is especially clear in my works P*ickhammeraxe* and *Valigia Avvolgente*, which are formed of several pieces that can be arranged in any order during a performance but which have an unavoidable presence when used during performance. What makes them successful is the use of what I have termed *sonic individuality* in which each element of the unit is given such a strong individual sound and touch in relation to the other pieces that one piece is able to transmit its part of the composition in a satisfactory way to the audience even without the rest. Giving each part a strong individual sound becomes an organizational principle in a spatial performance in that the modularity of the parts allows the musician to move the parts and themselves, simultaneously altering the possible musical landscape and the music's organizational outcome. Thus, like in the abstraction of *Valigia Avvolgente* where the plants growth slowly becomes audible on the structure, the actions, movements, and playing become entangled in the shape in and around the instrument.

Approaches and Categories as Research Results

My approaches to the thematics which my research growth bloomed in were four themed categories, which in turn hold actions, relations, perceptions, and communication. This thematic modularity yields a synthesis of semantic

87 Weizman and Misselwitz, 'Military Operations as Urban Planning'.

elements by formalizing the process of their exchange in a three part structure where there are two categories and the one theme. The themes and subcategories are:

Touch and Instruments

BMI ---- Building and Making instruments

PLI ----- Playing and Learning instruments

RLI ----- Re-learning instrument

MI ----- Modifying instruments

T1, T2, T3, T4, T5, …, ----- Touching one instrument, or touching more than one instrument

PBS ----- Playing and building simultaneously

CT ----- Collaborative touch, touching instruments together

Touch and Relationships

TRM ----- Touch and its relation to music (the touch of music)

TRS ----- Touch and its relation to space

TRTI ----- Touch and its relation to time

TRO ----- Touch and its relation to order

TRW ----- Touch and its relation to writing

TRN ----- Touch and its relation to notation

Touch and Senses

WST ----- Watching and seeing touch

HLT ----- Hearing and listening to touch

TST ----- Tasting and smelling touch

TIT ----- Touching and imitating touch

PS ----- Playing the skin

SST ----- Speaking and saying touch

Touch In and Out of Discourse

TWF, TWS, TWD -----Touch as way-finding, stumbling, and discovery

TAA ----- Touch as allegory

TA ----- The Touch of the audience

HRT ----- Historical research into Touch

RPTR ----- Retaking the poses and positions of seen touches as composition research

Reference Table

In my research these themes and categories, what I would call the leaves of the tree of research, were mapped out on the compositions as a tool for assessing my research objectives: PHA = Pickhammeraxe, V-P = Violino-Piccolo, H = Heel, T&T = Twang & Twang II: Seeding Tonality, TLS = The Land Singing, VA = Valigia Avvolgente, FFT = Fourteen Times In Touch, SI = Sonic Independence

PHA	V-P	H	T&T	TLS	VA	FTT	SI	
X	X	X		X	X	X	X	TRN
X	X	X		X	X		X	PLI
X	X	X		X	X		X	TIT
X	X	X	X			X	X	SST
X	X		X		X		X	HLT
X		X		X	X		X	CT
		X			X	X	X	T1
			X	X	X			TA
			X	X	X	X	X	TRTI
X	X	X			X			TRM
X	X	X				X		RLI
X		X		X				PS
X	X	X			X			MI
X	X				X		X	TRO
		X			X	X	X	TWF
			X		X		X	TRS
				X	X		X	WST
	X		X		X		X	PBS
			X	X	X		X	BMI
		X		X			X	TST
	X				X			HRT
		X				X		TRW
							X	TAA

This mapping reveals how each composition falls within the categorization I have made during my research. This distribution in the form of music is different for each piece. This is important for my research because it informed my work in suggesting areas of touch which I had neglected, and because I can combine place thematic materials within the matrix to yield future research topics of interest which combine sound and touch.

What can be heard in my music is that by placing the start of the instance of music at the first stroke of making the instrument the composed sounds that emerge from this making clearly aestheticize the sounds of work and includes them in the body of music. At the other end of my music the sounds of discourse, of speech and voices guided by ideas are included. Between these two are the performances in which it is possible to hear both the sounds of work, its scrapes, clangs, and bangs, and a sound of moving, manipulating, and fiddling. What drives my research is the feeling of being limited by previous definitions of what music is, which, when combined with a desire to compose music that is beyond vision, has sought to explore an approach to music that more accurately expresses the realism of the external world – taking in its beauty, tragedy, absurdness, hilarity, the big and small – and the human and in-human ability to manipulate materials and beings to our will. This is why I have not approached the aesthetics of my music from the point of view of mere organization, i.e. deciding where, what, and when to touch, but through the observation of the phenomena of touch that already happens in music which asks about its material, relational, and symbolic functions and how they compare to those in music, in order to see how what touch can bring to music, but more importantly the ways I in which touch already exists in music.

Epilogue

As I finish this thesis I am working as the artist-in-residence in a joint project by the Ramallah Municipality and several other organizations that will result in a six month group exhibition at U-Jazdowski Castle of Contemporary Art in Warsaw Poland. I decided to include this epilogue because the work am doing here directly stems from my PhD thesis and in this sense I do not feel as if the thesis has ended but that it directly continues to my next projects. I came to Ramallah wanting to understand how walls are hillsides that support sound and how cavities, passages, volumes and shapes give life to resonance, and how through the immaterial resistance of sound, people have learnt to live. Yet, passing almost daily through the checkpoints in the partition wall, sometimes with several thousand people at once, in relation to what I have been discussing in my thesis I am confronted by this huge instrument that controls people by its affordances, its entrances and the interior design of the structure. I see how this wall does not resonate but only reflects and refracts the interior of itself, and while I know that the wall has no inside or outsides, it is simply in the way; it not only reminds me of the way I have worked to control the senses through using the concept of affordance. I am reminded of what is known as the ‘double-vessel’, a symbol of the Chalcolithic Age, where two chalices are joined together for a mysterious ceremonial reason.[88] This image brings me back to my first experience in making a musical instrument, the double headed drum or batá.

88 Florensky, *Beyond Vision*, p.164–167.

My first experience in making an instrument is also the same point at which I began my path towards conceptualizing touch in the mixture between making a musical instruments and playing a musical instruments. It was during the second Intifada and at the time we had just moved to the centre of Jerusalem from the outskirts, a village called Beit Safafa. The musical sounds I could play and listen to were for me an escape from the violence of occupation and of resistance. Music has always been an escape from the everyday and as I wanted instruments I could not buy I began making them. This escape is music's myth as Adorno put it, but for me, I found a better escape in constructing musical instruments that were physical manifestations of my metaphysical prayers and the instruments began having their own sign system mixing in with the sounds I wanted to produce.

That my research into touch ends in the same place where I first started imagining and making musical instruments feels very significant. So much so that I feel that I will end with a quote from my then-favourite book that reminds me of how long I have thought of touch, and for how long I have disagreed with how it is portrayed as an extension and hidden aspect in playing:

> Finally, we have touch strokes. They are used for timing only and are not audible. Nevertheless, touches form an important part of the batá performance by helping the performer to internalize and lock into the proper rhythmic groove. Think of batá drumming as a dance for the hands. Touches constitute those subtle weight shifts between steps, the balance points where the dancer must choose and define his next movements. When studying the transcriptions notice that most touches anticipate the movement from one drumhead to the other, a right hand touch will be followed by a left hand stroke and vice versa.
>
> Touches need not be played, nor are the ones transcribed the only possibilities. However, they can be very helpful, so use our

recommendations until you are thoroughly familiar with the rhythms. Then if you wish to delete or modify them, go ahead. Careful listening to the recordings listed in the discography will be instructive. Some touches that we suggest for iyá become sounded notes within other ensembles. (And vice versa, others may play some of our sounded notes as touches.) This is natural, for touches are placed at rhythmic pressure points which often serve as the basis for variation and conversation.

Touches are played by bringing the tips of all four fingers gently against the drumhead. In general, they should be mentally and physically grouped to feel like either a response to the preceding slap or a timing setup for an upcoming stroke. With a little practice you will find that the touch is a natural extension of normal performance.[89]

89 John Amira and Steven Cornelius, *The Music of Santeŕa: Traditional Rhythms of the Batá Drum* (Reno: White Cliffs Media, Inc. 1999), p.33

Bibliography

Adorno, Theodor W., *Philosophy of New Music*, trans. by Robert Hullot-Kentor (Minneapolis: University of Minnesota Press, 2006)

Aho, Marko, *The Tangible in Music: The Tactile Learning of a Musical Instrument* (London: Routledge, 2016)

Ahmed, Sara and Jackie Stacey, eds., *Thinking Through The Skin* (London: Routledge, 2001)

Aristotle, *De Anima: Books II and III (with passages from Book I)*, trans. by D. W. Hamlyn (Oxford: Clarendon Press, 2002)

Bhagwati, Sandeep, Marcello Giordano, Joanna Berzowska, Alex Bachmayr, Julian Stein, Joseph Browne, Felix Del Tredici, Deborah Egloff, John Sullivan, Marcelo Wanderley and Isabelle Cossette, 'Musiking the Body Electric: The "Body:Suit:Score" as Polyvalent Score Interface for Situational Scores', *Second International Conference on Technologies for Music Notation and Representation* (2016) <https://www.tenor-conference.org/proceedings/2016/17_Bhagwati_tenor2016.pdf> [accessed: 10 January 2020]

Baird, Davis, *Thing Knowledge: A Philosophy of Scientific Instruments* (Berkeley: University of California Press, 2004)

Bandt, Ros, 'Sound Installation: Blurring the Boundaries of The Eye, The Ear, Space and Time', *Contemporary Music Review*, 25 (2006), 353–365

Barker, Timothy, 'Objects and Interaction', *Digital Creativity*, 22 (2011), 65–77

Barrile, Paolo, *Paolo Barrile*, ed. by Adriano Barvella, trans. by Richard Birkby, and others, other texts by Carmelo Strano and others (Milan: Antonio Battaglia Arte Contemporanea, 2005)

Benjamin, Walter, *Illuminations*, ed. by Harry Zohn, trans. by Hanna Arendt (New York: Schocken Books, 1969)

Birringer, Johannes and Michèle Danjoux, 'Wearable Performance', *Digital Creativity*, 20 (2009), 95–113

Bjelić, Dušan, *Galileo's Pendulum: Science, Sexuality, and the Body-Instrument Link* (Albany: State University of New York Press, 2003)

Bourriaud, Nicolas, *Postproduction Culture As Screenplay*, ed. by Caroline Schneider, trans. by Jeanine Herman (New York: Lukas & Sternberg, 2002)

—, *Relational Aesthetics*, trans. by Simon Pleasance, Fronza Woods and Mathiue Copeland (Paris: les presses du réel, 1998)

Brennan, Marcia, Alfred Stieglitz and Paul Rosenfeld, 'An Aesthetic of Intimacy', *History of Photography*, 23 (1999), 73–81

Bovermann, Till, Alberto de Campo, Hauke Egermann, Sarah-Indriyati Hardjowirogo, Stefan Weinzierl, eds., *Musical Instruments in the 21st Century: Identities, Configurations, Practices* (Singapore: Springer, 2019)

Butler, Judith, 'The Returns of Touch: Feminist Performances, 1960-80' <https://www.amherst.edu/system/files/media/0765/Butler_Returns_of_Touch.PDF> [accessed: 7 November 2016]

Camps, Jeroen, Chloé Tuteleers, Jeroen Stouten and Jill Nelissen, 'A Situational Touch: How Touch Affects People's Decision Behaviour', *Social Influence*, 8 (2013), 237–250

Cekaite, Asta, 'The Coordination of Talk and Touch in Adult's Directives To Children: Touch and Social Control', *Research on Language and Social Interaction*, 48 (2015), 152–175

Chatterjee, Helen J., ed., *Touch In Museums: Policy and Practice In Object Handling* (Oxford: Berg Publishers, 2008)

Chen, Mel Y., *Animacies: Biopolitics, Racial Mattering, and Queer Affect* (London: Durham University Press, 2012)

Cho, Siwon and Jane E. Workman, 'Effects Of Need For Touch: Centrality Of Visual Product Aesthetics and Gender on Channel Preference for Apparel Shopping', *Journal of Global Fashion Marketing*, 6 (2015), 120–135

Christov-Bakargiev, Carolyn, ed., *ARTE POVERA* (London: Phaidon Press Limited, 2001)

Cirnigliaro, Noelia S., 'Touching the Ground: Women's Footwear in the Early Hispanic World: An Introduction', *Journal of Spanish Cultural Studies*, 14 (2013), 107–119

Clarke, David and Eric Clarke, eds., *Music and Consciousness: Philosophical, Psychological, and Cultural Perspectives* (Oxford: Oxford University Press, 2011)

Cole, William Davy, 'Separability, Visualism, and Presentness: Unpacking the Material-Discursive Configuration and Operations of Music's Work-Concept', presentation given at *Music and Materialisms*, Kingston

University, 23 February 2019, available online at: https://musicandmaterialisms.files.wordpress.com/2019/02/music-materialisms-2019-abstracts.pdf <accessed: 16 January 2020>

Conrman, James W., *Materialism and Sensation* (London: Yale University Press, 1971)

Curran, Jane, 'Sculpture: Some Observations On Shape And From Pygmalion's Creative Dream (review)', *Seminar, A Journal Of Germanic Studies*, 42 (2006), 77–79

Creswell, John W., *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (London: Sage Publishing, 2009)

Dann, Rachael J., 'Touchy Objects', *The Senses and Society*, 7 (2012), 99–102

Davies, Stephen, *Musical Understanding* (Oxford: Oxford University Press, 2011)

—, *Musical Works & Performance* (Oxford: Oxford University Press, 2001)

—, *Themes In The Philosophy Of Music* (Oxford: Oxford University Press, 2003)

Debord, Guy, ‘Introduction to a Critique of Urban Geography’, (Les Lčvres Nues #6, 1955) <http://www.bopsecrets.org/SI/urbgeog.htm> [accessed: 7 November 2016]

Delong, Marilyn, Juanjuan Wu and Juyeon Park, ‘Tactile Response and Shifting Touch Preference’, *TEXTILE,* 10 (2012), 44–59

Denzer, Ricarda and Monika Seidl, eds., *Turning Silence Into Objects: W. H. Auden in Kirchstetten* (St Pölten: Literaturedition Niederösterreich, 2014)

Dolphijn, Rick, ‘An Aesthetic of the Mouth’, *Angelaki*, 11 (2006), 179–188

Derrida, Jacques, *Of Grammatology*, trans. by Gayatri Chakravorty Spivak (London: The Johns Hopkins University Press, 1997)

—, *On Touching – Jean-Luc Nancy*, trans. by Christine Irazarry (Stanford: Stanford University Press, 2005)

Dibiase, Rosemarie and Jaime Gunnoe, ‘Gender and Culture Differences in Touching Behaviour’, *Journal Of Social Psychology*, 144 (2004), 49–62

Doğantan-Dack, Mine, ‘In The Beginning Was Gesture: Piano Touch and The Phenomenology of The Performing Body’, in *New Perspectives On*

Music and Gesture, eds. Anthony Gritten and Elaine King, (Farnham: Ashgate, 2011), 243–265

Dougherty, Stephen, 'Post-Deconstruction and the Rhetorics of Touch', *Journal of Cultural Research*, 15 (2011), 75–92

Drobnick, Jim, 'Towards an Olfactory Art History', *The Senses and Society*, 7 (2012), 196–208

Duncum, Paul, 'An Eye does not make an I: Expanding the Sensorium', *Studies in Art Education*, 53 (2012), 182–193

Eagleton, Terry, *Materialism* (London; Yale University Press, 2016)

Eidsheim, Nina Sun, *Sensing Sound: Singing & Listening as Vibrational* Practice (London, Duke University Press, 2015)

Fast, Heidi, Taru Leppänen, and Milla Tiainen, 'Vibration', *New Materialism Almanac* (2018) <https://newmaterialism.eu/almanac/v/vibration.html> [accessed: 9 January 2020]

Ferneyhough, Brian, 'The Tactility of Time (Darmnstadt Lecture 1988)', *Perspectives of New Music*, 31 (1993), 20–33

Florensky, Pavel, *Beyond Vision: Essays on the Perception of Art*, ed. by Nicoletta Misler, trans. by Wendy Salmond (London: Reaktion Books, 2012)

Forcucci, Luca, 'Touching the Audience', *Proceedings of the Electroacoustic Music Studies Network Conference* (2014) <http://www.ems-network.org/IMG/pdf_EMS14_forcucci.pdf> [accessed: 7 November 2016]

Fors, Vaike, 'Teenagers Multisensory Routes for Learning in The Museum', *The Senses And Society*, 8 (2013), 268–289

Fox, Christopher, ed., *Tempo: A Quarterly Review of New Music*, 287 (2019)

Gadoua, Marie-Pierre, 'Making Sense Through Touch', *The Senses and Society*, 9 (2014), 323–341

Gagnon, Charles, 'Touching and Making: Encounters With Matter', (unpublished doctoral thesis, Concordia University, 2012)

Galkin, Elliot W., *A History of Orchestral Conducting: In Theory and Practice* (New York: Pendragon Press, 1988)

Gallace, Alberto and Charles Spence, ‘The Science of Interpersonal Touch: An Overview’, *Neuroscience and Behavioral Reviews*, 34 (2010), 246–259

—, ‘Tactile Aesthetics: Towards A Definition of its Characteristics and Neural Correlates’, *Social Semiotics*, 21 (2011), 569–589

Gallese, Vittorio and Sjoerd Ebisch, ‘Embodied Simulation and Touch: The Sense of Touch in Social Cognition’, (Parma: Universita’ Degli Studi Di Parma, 2013) <http://old.unipr.it/arpa/mirror/pubs/pdffiles/Gallese/2013/Gallese_Ebisch_2013.pdf> [accessed: 7 November 2016]

Gansterer, Nikolaus, Emma Cocker, and Mariella Greil, *Choreo-Graphic Figures: Deviations from the Line* (Berlin: De Gruyter, 2017)

Garcia, Luis-Manuel, ‘Beats, Flesh, and Grain: Sonic Tactility and Affect in Electronic Dance Music’, *Sound Studies*, 1 (2015), 57–76

Gardiner, Ann and Chris Perkins, ‘Teaching Touch on the Townpath: A Tactile Map for a Visit to the Countryside’, *The Cartographic Journal*, 33 (1996), 111–118

Gibson, James J., *The Ecological Approach to Visual Perception* (London: Psychology Press, 2015)

Gibson, James J. and Frederik A. Backlund, ‘An After-Effect in Haptic Space Perception’, *Quarterly Journal of Experimental Psychology*, 15 (1963), 145–154

Goehr, Lydia, *The Imaginary Museum of Musical Works* (Oxford: Oxford University Press, 2002)

Golledge, Reginald G., ‘Reflections on Procedures for Learning Environment Without the Use of Sight’, *Journal of Geography*, 104 (2005), 95–103

Gracyk, Theodor and Andrew Kania, eds., *The Routledge Companion to Philosophy and Music* (New York: Routledge, 2011)

Graves, Robert, *The White Goddess: A Historical Grammar of Poetic Myth*, ed. by Grevel Lindop (London: Faber & Faber, 2010)

Grunwald, Martin, ed., *Human Haptic Perception: Basic and Applications* (Basel: Birkhäuser, 2008)

Hammer, Espen, ‘Happiness and Pleasure in Adorno’s Aesthetics’, *Literature, Culture, Theory*, 90 (2015), 247–259

Hanslick, Eduard, *The Beautiful in Music*, trans. by Gustav Cohen (London: Novello and Company, 1891)

Haraway, Donna, *Simians, Cyborgs, And Women: The Reinvention Of Nature* (London: Free Association Books, 1991)

—, *When Species Meet* (Minneapolis: University of Minnesota Press, 2008)

Hardt, Michael and Antonio Negri, *Multitude: War and Democracy in the Age of Empire* (New York: Penguin, 2004)

Have, Iben, and Helle Breth Klausen, eds., 'Sound and Senses', *SoundEffects*, 8 (2019)

Herring, Frances, W., 'Touch, The Neglected Sense', *Journal of Aesthetics and Art Criticism*, 7 (1949), 199–215

Hertenstein, Matthew J. and Dacher Keltner, 'Gender and the Communication of Emotion via Touch', *Sex Roles*, 64 (2011), 70–80

Hertenstein, Matthew J., J.M. Verkamp, A.M. Kerestes, R.M. Holmes, 'The Communicative Functions of Touch in Humans, Nonhuman Primates, and Rats: A Review and Synthesis of the Empirical Research', *Genetic, Social, and General Psychology Monographs*, 132 (2006), 5–94

Holt, Matthew, ‘Transformation Of The Aesthetic: Art As Participatory Design’, *Design and Culture*, 7 (2015), 143–165

Hsu, Elisabeth, ‘Towards a Science of Touch, Part I: Chinese Pulse Diagnostics in Early Modern Europe’, *Anthropology & Medicine*, 7 (2000), 251–268

Ippolito, Jon, ‘Trusting Aesthetics to Prosthetics’, *Art Journal*, 56 (1997), 68–74

Intraub, Helene, ‘Anticipatory Spatial Representation of Natural Scenes: Momentum Without Movement?’ *Visual Cognition*, 9 (2002), 93–119

Isenstadt, Sandy, ‘Back in Touch’, *The Senses and Society*, 8 (2013), 113–116

Jameson, Frederic, *Postmodernism: Or the Cultural Logic of Late Capitalism* (Durham: Duke University Press, 1991)

Jones, Robyn L., Jake Bailey and Sofia Santos, ‘Coaching Caring and the Politics of Touch: A Visual Exploration’, *Sport, Education And Society*, 18 (2013), 648–662

Jones, Stanley E., ‘Sex Differences in Touch Communication’, *Western Journal of Speech Communication*, 50 (2009), 227–41

Kahlo, Frida, *The Diary Of Frida Kahlo: And Intimate Self Portrait*, ed. Phyllis Freeman, trans. by Barbara Crow de Toledo and Ricardo Pohlenz (New York: Harry N. Abrams, 1995)

Kannengiesser, Udo and John S. Hero, ‘A Process Framework of Affordances in Design’, *Design Issues*, 28 (2012), 50–62

Kemske, Bonnie, ‘Embracing Sculptural Ceramics: A Lived Experience of Touch in Art’, *The Senses and Society*, 4 (2009), 323–345

Kilby, Jane, ‘A Withdrawn Vision: Art, Realism and the Scene of Incest’, *Journal of Cultural Research*, 8 (2004), 317–334

Kivy, Peter, *Authenticities* (Princeton: Princeton University Press, 1995)

—, *Sound and Semblance* (Princeton: Princeton University Press, 1984)

Klatzky, Roberta L. and Susan J. Lederman, ‘Touch’, *Experimental Psychology*, 4 (2002), 147–176

—, ‘Haptic Perception: A Tutorial’, *Attention, Perception, & Psychophysics*, 71 (2009), 1439–1469

Koistinen-Armfelt, Ritva, ‘Kehollisuus ja Kosketus Kanteleensoitossa’, (unpublished doctoral thesis, Aalto University, 2016)

Kolehmainen, Alfred, *Karjalaiset Vanhat Lukot: Lukkoperinne 2* (Helsinki, WSOY, 1989)

Kramer, Jonathan D., ‘Postmodern Concepts of Musical Time’, *Indiana Theory Review*, 17 (1996), 21–62

Krüger, Matthias, ‘The Art Critic As Graphologist: Handwriting, Typography and the Painterly Touch in the Era of Impressionism’, *Pradella*, 29 (2011)

Kuhns, Richard, ‘Art and Community: Paradoxes of Planning’, *Proceedings of Sixth International Congress of Aesthetics* (1968), 105–112

Lagrosen, Yvonne and Stefan Lagrosen, ‘Aesthetic Service Quality – A Study of a Symphony Orchestra’, *Total Quality Management & Business Excellence*, (2015), 1–13 <http://dx.doi.org/10.1080/14783363.2015.1082419>

Lajer-Burcharth, Ewa, ‘Pompadour’s Touch: Difference in Representation’, *Representations*, 73 (2001), 54–88

Linden, David J., *Touch: The Science of the Sense That Makes Us Human* (UK: Penguin, 2015)

Ludden, G.D.S. and T.J.L. van Rompay, ‘How Does It Feel? Exploring Touch on Different Levels of Product Experience’, *Journal of Engineering Design*, 26 (2015), 157–168

Magnusson, Thor, ‘Affordances and Constraints in Screen-Based Musical Instruments’, *Proceedings NordiCHI* (2006) <http://www.ixi-software.net/thor/instrumentAffordances.pdf> [accessed: 15 August 2016]

—, ‘Of Epistemic Tools: Musical Instruments as Cognitive Extensions’, *Organised Sound*, 14 (2009), 168–176

—, *Sonic Writing: Technologies of Material, Symbolic & Signal Inscriptions* (London: Bloomsbury Academic, 2019)

Mahrer, Paul and Christopher Miles, ‘Recognition Memory for Tactile Sequences’, *Memory*, 10 (2002), 7–20

Manning, Erin, *Politics of Touch: Sense, Movement, Sovereignty* (Minneapolis: University Of Minnesota Press, 2007)

—, 'Taking the Next Step: Touch as Technique', *The Senses and Society*, 4 (2009), 211–225

Mark, David M., Christian Freksa, Stephen C. Hirtle, Robert Lloyd and Barbara Tversky, 'Cognitive Models of Geographical Space', *International Journal of Geographical Information Society*, 13 (1999), 747–774

Marks, Laura U., *The Skin of the Film: Intercultural Cinema, Embodiment, and the Senses* (London: Duke University Press, 2000)

Marshall, Bonnie and Stuart Levy, 'Microbial Contamination of Musical Wind Instruments', *International Journal of Environmental Health Research*, 21 (2011), 275–285

Marsden, Jill, 'Review of Daniel Heller-Roazens The Inner Touch: Archaeology of a Sensation', <http://www.nietzschecircle.com/Pdf/Marsden-Inner_Touch-FINAL.pdf> [accessed: 7 April 2016]

Massie, Pascal, ‘Touching, Thinking, Being: The Sense of Touch in Aristotle’s *De anima* and Its Implications’, *Minerva – An International Journal of Philosophy*, 17 (2013), 74–101

Martin, Reinhold, *The Organizational Complex: Architecture, Media, and Corporate Space* (London: MIT Press, 2003)

McDonough, Tom, ‘Touching and Tasting: Notes on Art and Utility’, The New Mechanics Library <http://www.grizedale.org/projects/coniston-institute-library/the-new-mechanics-library> [accessed: 7 April 2016]

McHugh-Grifa, Abigail, ‘The Use of Touch to Facilitate Learning in Music Education’, *Visions of Research in Music Education*, 18 (2011)

McMurray, Peter, ‘Music – Haptic Or Optic?’, *Repercussions*, 11 (2014), 1–47

Merleau-Ponty, Maurice, *Phenomenology of Perception*, trans. by Donald A. Landes (London: Routledge, 2012)

—, *The Visible and the Invisible*, ed. by Claude Lefort, trans. by Alphonso Lingis (Evanston: Northwestern University Press, 1968)

Miller, Michael J., Noah Franken and Kit Kiefer, ‘Exploring Touch Communication Between Coaches and Athletes’, *Indo-Pacific Journal of Phenomenology*, 7 (2007), 1–13

Mintz, Susannah, ‘Mindful Skin: Disability and the Ethics of Touch in Life Writing’, *Life Writing*, 13 (2016), 47–62

Mohammed, Ilyad, ‘The Theory of Perception in the Aesthetic Conception of Helmut Lachenmann: A ‘Rediefined’ Trial of the ‘Functional’ Aspect Of Music’, *Contemporary Music Review*, 23 (2004), 91–95

Mooney, James, ‘Frameworks and Affordance: Understanding the Tools of Music Making’, *Journal of Music, Technology and Education*, 3 (2010), 141–154

—, ‘Hugh Davies’s Self-Built Instruments And Their Relation To Present Day Electronic And Digital Instrument-Building Practices’, *Proceedings of IFIMPAC conference* (2015) <http://eprints.whiterose.ac.uk/84316/1/Hugh%20Davies%20Self-Built%20-%20Web%20PDF.pdf> [accessed: 6 April 2016]

Morita, Satoshi, ‘Sonic Art for Intersensory Listening Experience’, *Proceedings of the Electroacoustic Music Studies Network Conference*

Electroacoustic Music Beyond Performance (2014) <http://www.ems-network.org/IMG/pdf_EMS14_morita.pdf> [accessed: 6 April 2016]

Mulvin, Dylan and Jonathan Sterne, 'Introduction: Temperature is a Media Problem', *International Journal of Communication*, 8 (2014)

Nancy, Jean-Luc, *Corpus*, trans. by Richard A. Rand (New York: Fordham University Press, 2008)

—, *Corpus*, trans. by Susanne Lindberg (Tampere: Gaudeamus, 1996)

—, *Being Singular Plural*, eds. Werner Harnacher and David E. Wellbery, trans. by Robert D. Richardson and Anne E. O'Byrne (Stanford: Standford University Press, 2000)

—, *The Experience of Freedom*, trans. by Bridget McDonald (Stanford: Stanford University Press, 1993)

—, *The Inoperative Community*, ed. by Peter Connor, trans. by Peter Connor, Lisa Garbus, Michael Holland and Simona Sawhey (Oxford: University of Minnesota Press, 1991)

—, *The Ground of the Image*, trans. by Jeff Fort (New York: Fordham University Press, 2005)

Noheden, Kristiffer, ‘The Imagination of Touch: Surrealist Tactility in The Films of Jan Svankmajer’, *Journal of Aesthetics & Culture*, 5 (2013)

Nudds, Matthew and Casey O’Callaghan, eds., *Sounds & Perception* (Oxford: Oxford University Press, 2009)

Nunes, Rodrigo, *Organisation of the Organisationless: Collective Action After Networks* (PML Books, 2014) <http://www.metamute.org/sites/www.metamute.org/files/pml/Organisation-of-the-Organisationless.pdf> [accessed: 15 November 2016]

O’Donoghue, Helen, ‘Body Knowledge and Curriculum: Pedagogies of Touch in Young and Visual Culture’, *Irish Educational Studies*, 28 (2009), 225–227

Oliver, Martin, ‘The Problem with Affordance’, *E-Learning*, 4 (2005), 402–413

Ortman, Otto, *The Physiological Mechanics of Piano Technique* (Baltimore: Research Laboratory of the Peabody Conservatory of Music, 1925)

Ouzman, Sven, ‘Seeing is Deceiving: Rock Art and the Non-Visual’, *World Archaeology*, 33 (2001), 237–256

Ownby, Terry, ‘Critical Visual Method: Photography and Narrative Text as Visual Autoethnography’, *Online Journal of Communication and Media Technologies*, Special Issue (2013) <http://www.ojcmt.net/special/jan_2013/1.pdf> [accessed: 6 October]

Pallasmaa, Juhani, *Eyes of the Skin: Architecture and the Senses* (London: Wiley-Academy, 2007)

Patteson, Thomas, *Instruments for New Music: Sound, Technology, and Modernism* (Oakland, University of California Press, 2016)

Park, Hu-Yong, ‘How Useful is Braille Music?: A Critical Review’, *Development and Education*, 62 (2015), 303–318

Partch, Harry, *Genesis of a Music 2nd enlarged edition* (New York: Da Capo Press, 1974)

Paterson, Mark, *The Senses of Touch: Haptics, Affects and Technologies* (New York: Berg 2007)

—, *Seeing with the Hands: Blindness, Vision, and Touch after Descartes* (Edinburgh: Edinburgh University Press, 2016)

—, ‘Haptic Geographies: Ethnographic, Haptic Knowledges and Sensuous Dispositions’, *Progress in Human Geography*, 33 (2009), 766–788

—, ‘Introduction: Re-Mediating Touch’, *The Senses and Society*, 4 (2009), 129–140

—, ‘Seeing With the Hands, Touching With the Eyes: Vision, Touch and The Enlightenment Spatial Imaginary’, *The Senses and Society*, 1 (2006), 225–243

Paterson, Mark, Martin Dodge and Sara MacKian, ‘Introduction: Placing Touch Within Social Theory and Empirical Study’, <http://personalpages.manchester.ac.uk/staff/m.dodge/Touching_Space_introduction_proof.pdf> [accessed: 7 November 2016]

Paulsen, Geda, Mari Uusküla and Jonathan Brindle, eds., *Color Language and Color Categorization* (Cambridge: Cambridge Scholars Publishing, 2016)

Peters, Mark, ‘More-than Visual Approaches to Architecture: Vision, Touch, Technique’, *Social & Cultural Geography*, 12 (2011), 263–281

Pfeifer, Geoff, *The New Materialism: Althusser, Badiou, and Zizek* (London: Routledge, 2015)

Posman, Sarah, Anne Reverseauu, David Ayers, Sascha Bru, Benedikt Hjartson, eds., *The Aesthetics of Matter: Modernism, the Avant-Garde and Material Exchange* (Berlin: De Gruyter, 2013)

Potter, Caroline, 'Sense of Motion, Sense of Self: Becoming a Dancer', *Ethnos*, 73 (2008), 444–465

Prescott-Steed, David, 'Art/Porn: A History of Seeing and Touching', *Continuum*, 24 (2010), 330–333

Pugliese, Roberto, 'Creating and Evaluating Embodied Interactive Experiences: Case Studies of Full-body, Sonic and Tactile Enaction', (unpublished doctoral thesis, Aalto University, 2016)

Raaijmakers, Dick, *CAHIER M: A Brief Morphology of Electric Sound* (Ghent: Leuven University Press, 2000)

Rafaeli, Anat and Iris Vilnai-Yavetz, 'Instrumentality, Aesthetics and Symbolism of Physical Artefacts as Triggers of Emotion', *Theoretical Issues in Ergonomics Science*, 5 (2004), 91–112

Randolph, Adrian W. B., *Touching Objects: Intimate Experiences of Italian Fifteenth-Century Art* (New Haven and London: Yale University Press, 2014)

Raybrouck, Mark, ‘Music Cognition and the Bodily Approach: Musical Instruments as Tools for Musical Semantics’, *Contemporary Music Review*, 25 (2006), 59–68

Ravasio, Matteo, ‘On the Destruction of Musical Instruments’, *Journal of Aesthetics & Culture*, 8 (2016), 1–9

Rebelo, Pedro, ‘Haptic Sensations and Instrumental Transgressions’, *Contemporary Music Review*, 25 (2006), 27–35

Robinson, Christine, ‘The Instrument as an Expression of a Musician’s Internal World’, *Psychodynamic Counselling*, 5 (1999), 443–452

Rossholt, Nina, ‘Food as Touch/Touching the Food: The Body In-place and Out-of-place in Preschool’, *Educational Philosophy and Theory*, 44 (2012), 323–334

Rumph, Stephen, ‘The Sense of Touch in Don Giovanni’, *Music & Letters*, 88 (2007), 561–588

Rupp, Susanne and Tobias Döring, *Performances of the Sacred in Late Medieval and Early Modern England*, (Amsterdam: Rodopi, 2005)

Ruzicka Peter, ‘Toward a New Aesthetic Quality: On Helmut Lachenmann’s Aesthetics of Material’, *Contemporary Music Review*, 23 (2004), 97–102

Ryan, David and Helmut Lachenmann, ‘Composer in Interview: Helmut Lachenmann’, *Tempo, New Series*, 210 (1999), 20–24

Sarukkai, Sundar, ‘Phenomenology of Untouchability’, *Economic & Political Weekly*, 44 (2009)

Segal, Naomi, ‘The Exchange of Two Fantasies and the Contact of Two Epidermis: Gesture of Touch in Gattaca (1997), The Talented Mr. Ripley (1999) and The Piano (1993)’, *Journal of Cultural Research*, 19 (2015), 96–109

Sextus Empiricus, *Against The Musicians*, trans. by Denise Davidson Greaves (London: University of Nebraska Press, 1986)

Scarantino, Andrea, ‘Affordances Explained’, *Proceedings of the 2002 Biennal of The Philosophy of Science*, 70 (2003), 949–961

Schirmer, Annette, K.S. Teh, S. Wang, R. Vijayakumar, A. Ching, D. Nithianantham, N. Escoffier, A.D. Cheok, ‘Squeeze Me, But Don’t Tease Me: Human and Mechanical Touch Enhance Visual Attention and Emotion Discrimination’, *Social Neuroscience*, 6 (2011), 219–230

Schroeder, Franziska, ‘Bodily Instruments and Instrumental Bodies: Critical Views on the Relation of the Body and Instrument in Technological Information Performance Environments’, *Contemporary Music Review*, 25 (2006), 1–5

Schwab, Michael, ed., *Experimental Systems: Future Knowledge in Artistic Research* (Leuven: Leuven University Press, 2013)

Scruton, Roger, *The Aesthetic of Music* (Oxford: Oxford University Press, 2009)

Shiori, Satoshi, Takanori Yamazaki, Kazumichi Matsumiya and Ichiro Kuriki, ‘Rotation-independent Representations for Haptic Movements’, *Scientific Reports*, 3 (2013)

Simpson, D.P., *Cassell’s Latin Dictionary* (London: Cassell, 1987)

Slattery, Dennis P., ‘Mimesis, Neurology, and the Aesthetics of Presence’, *Psychological Perspectives*, 56 (2013), 268–288

Steed, Orlando A., ‘On Beauty of Touch and Tone: An Inquiry in The Physiological and Mechanical Principles Involved in their Cultivation’, *Proceedings of the Musical Association*, 7 (1880), 53–74

Stenslie, Stahl, ‘Virtual Touch: A Study of the Use and Experience of Touch in Artistic, Multimodal and Computer-based Environments’, (unpublished doctoral thesis, Oslo School of Architecture and Design, 2010)

Strehovec, Janez, ‘Cycling As Reading a Cityscape: A Phenomenological Approach to Interface Shaped Perception’, *Indo-Pacific Journal of Phenomenology*, 10 (2010), 1–11

Stobart, Henry, ‘In Touch with the Earth?: Musical Instruments, Gender and Fertility in the Bolivian Andes’, *Ethnomusicology Forum*, 17 (2008), 67–94

Styhre, Alexader, ‘The Aesthetics of Rock Construction Work: The Beauty of Sprayed Concrete, Rock Reinforcement and Roof Bolting’, *Culture and Organisation*, 14 (2008), 201–410.

Sojka, Eugenia, ‘Somatization of Writing and Semiotization of the Body: A Study of Selected Texts by English-Canadian Feminist Writers’, *Central European Journal of Canadian Studies*, 2 (2002), 15–26

Suominen, Anniina, ‘Writing Photographs, Re-Constructing Self: An Arts-based Autoethnographic Inquiry’, (unpublished doctoral dissertation, Ohio State University, 2003)

Suzuki, Hideo, ‘Spectrum Analysis and Tone Quality Evaluation of Piano Sounds with Hard and Soft Touches’, *Acoustic Sciences & Technology*, 28 (2007)

Suzuki, Yasuhiro, Rieko Suzuki, Fuminori Akiba, Junji Watanabe, ‘Tactile Score: a Method of Describing the Sense of Touching’*, Chiba University* (2013) <http://design-cu.jp/iasdr2013/papers/1802-1b.pdf> [accessed: 6 April 2016]

Szendy, Peter, *Phantom Limbs: On Musical Bodies*, trans. by Will Bishop (New York, Fordham University Press, 2016)

Tanaka, Atau, ‘Mapping Out Instrument, Affordances, and Mobiles’, *Proceedings of NIME* (2010) <https://pdfs.semanticscholar.org/213e/5de4b11d204fe93c1e71113a9686a858a852.pdf> [accessed: 21 February 2016]

Tawia, Susan, ‘When is the Capacity for Sentience Acquired During Human Fetal Development?’, *Journal Of Maternal-Fetal Medicine*, 1 (1992), 153–165

Taylor, Gretel, ‘Locating: Place and the Moving Body’, (unpublished doctoral thesis, Victoria University, 2008)

Tiainen, Milla, ‘Corporeal Voices, Sexual Differentiations: New Materialist Perspectives on Music, Singing and Subjectivity’, *Thamyris/Intersecting*, 18 (2007), 147–168

Tikka, Heidi, Sandra Viña, Giulio Jacucci and Teemu Korpilahti, ‘Provoking The City – Touch Installations for Urban Space’, *Digital Creativity*, 22 (2011), 200–214

Tillman, Chris, ‘Musical Materialism’, *British Journal of Aesthetics*, 51 (2011), 13–29

Thomen, Carl, ‘Sublime Kinetic Melody: Kelly Slater and the Extreme Spectator’, *Ethics and Philosophy*, 4 (2010), 319–331

Thompson, Erin H. and James A. Hampton, ‘The Effect of Relationship Status on Communicating Emotions Through Touch’, *Cognition and Emotion*, 25 (2011), 295–306

Tomàs, Enrique, ‘Musical Instruments as Scores: A Hybrid Approach’, *Second International Conference on Technologies for Music Notation and Representation* (2016) <http://tenor2016.tenor-conference.org/papers/16_Tomas_tenor2016.pdf> [accessed: 1 August 2016]

Tomàs, Enrique and Martin Kaltenbrunner, ‘Shaping the Inherent Instrument Score’, *Proceedings of NIME* (2014) <https://modin.yuri.at/publications/tscores_nime2014.pdf> [accessed: 5 January 2019]

Tornil, Bertrand and Nadine Baptiste-Jessel, ‘Music Haptic: Musical Harmony Notions for all with a Force Feedback Mouse and a Spatial Representation’, *International Computer Music Conference* (2005) <http://quod.lib.umich.edu/cgi/p/pod/dod-idx/music-haptic-musical-harmony-notions-for-all-with-a-force.pdf?c=icmc;idno=bbp2372.2005.187> [accessed: 21 February 2016]

Vachhani, Sheena J., ‘(Re)creating Objects from the Past – Affect, Tactility and Everyday Creativity’, *Management & Organizational History*, 8 (2013), 91–104

Verbeek, Caro, ‘Prière De Toucher!’, *The Senses And Society*, 7 (2012), 225–235

Verrips, Jojada, ‘Offending Art and the Sense of Touch’, *Material Religion*, 4 (2008), 204–225

Viera, Valter Alfred, ‘An Evaluation of The Need for Touch Scale and its Relationship with Need for Cognition, Need for Input, and Consumer Response’, *Journal of International Consumer Marketing*, 24 (2012), 57–78

Williams, Joseph M., ‘Synaesthetic Adjectives: A Possible Law of Semantic Change’, *Language*, 52 (1976), 461–478

Williams, Tristan R., ‘The Physicality of Sound Production on Acoustic Instruments’, (unpublished doctoral thesis, Brunel University, 2010)

Wilson, Samuel, ‘Building an Instrument, Building an Instrumentalist: Helmut Lachenmann’s Serynade’, *Contemporary Music Review*, 3 (2013), 425–436

Wolfe, Charles T., Ofer Gal, eds., T*he Body as Object and Instrument of Knowledge: Embodied Empiricism in Early Modern Science* (London: Springer, 2010)

Yoshioka, T., S.J. Bensmaïa, J.C. Craig and S.S. Hsiao, ‘Texture Perception Through Direct and Indirect Touch: An Analysis of Perceptual Space for Tactile Textures in Two Modes of Exploration’, *Somatosensory & Motor Research*, 24 (2007), 53–70

Zimmermann, Simone, Sonja Rümelin and Andreas Butz, ‘I Feel it in my Fingers: Haptic Guidance on Touch Surfaces’, *Proceedings of TEI* (2014)

Zuckert, Rachel, ‘Sculpture and Touch: Herder’s Aesthetic of Sculpture’, *The Journal of Aesthetics and Art Criticism*, 7 (2009) 285–299

Zorn, John, ed., *Arcana III, Musicians on Music* (New York: Hips Road, 2008)