

Timbral Frame

Expanding artistic identity through the process of
creating an installation-performance



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Abstract

This thesis investigates how reinforcing individuals' most meaningful ways of practice, and collaborative creativity, can affect the artistic outcome of a project and the formation of an artistic identity. It demonstrates how my personal artistic practice as a woodwind player, composer, and improviser is strengthened by traditional handcrafts, sound-oriented multidisciplinary practices, and interdisciplinary collaboration. The main body of the text is centered around the process of creating an installation-performance *timbral frame* in collaboration with three other multidisciplinary artists. The text reflects, articulates, contextualizes, and justifies the methods that I have used artistically in my personal work, and as a facilitator of an interdisciplinary collaboration.

Throughout the study I have referred back to my personal work with the modified instrument, as it offers tangible results to the research question investigating the influences on personal artistic identity. During the process of this study, the role of interdisciplinary collaboration reinforcing human connection grew bigger, becoming an integral part of the research.

Findings of this study shows how artistic identity and artistic practice exists in a reciprocal and mutually influential iterative cycle, and how collaboration taking a starting point from implementing meaningful forms of expression, and connectivity, can result in artistic outcomes that trace shared ownership between the creators. Further outcomes of this research include installation-performance, compositions, improvisations, collaborations, instrument modifications, techniques, multichannel loudspeaker system, sculpture, and a documentation of this process.

Keywords: *instrument modification, multichannel loudspeaker system, spatial audio, sound sculpture, interdisciplinary collaboration, installation-performance, artistic identity, collaborative creativity*

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Image 1: The installation space. Photo by Alisa Khodos.

CHAPTER I: Introduction

1.1 Introduction of the project

This artistic research master's project started in January 2025 motivated by my need to find methods on how artists' work can reach its full potential by focusing on the individuals' most meaningful ways of practice. In this specific study, my personal artistic practice as a musician, composer, and improviser is enhanced by implementing methods from instrument modification, traditional handcrafts, and sound art. This written thesis acts as an accompaniment to one of the artistic outcomes of this study, an installation-performance titled *timbral frame* which took place in May 2025. The text reflects, articulates, contextualizes, and justifies the methods that I have used in my artistic practice, and as a facilitator of an interdisciplinary collaboration.

Motivated by my partly lost interest towards musical performance practice, this artistic research project takes a starting point from reconfiguring my own artistic identity not only as a performing musician, but as a collaborating sound-oriented multidisciplinary artist. In addition to describing my personal artistic practice, key emphasis is placed on describing the process of creating an installation-performance through interdisciplinary collaboration, which took a starting point from non-artistic factors, such as shared identity and past experiences. In this study, collaboration is seen as a group of people working together to create artistic work and exchange ideas and share approaches on an equal ground. In this specific project I, Jaakko Arola, acted as the facilitator of the process and the other collaborators included three Finnish multidisciplinary artists; sound artist Otso Kauniskangas, visual artist Elisa Sakko, and dancer-musician Noora Arola.

Through this research I explored multidisciplinary working methods and timbral possibilities of modified instruments from an autoethnographic perspective. This was carried out with an overarching aim of investigating strategies for strengthening my artistic identity through working methods that feel most natural and meaningful for me. However, the role of the interdisciplinary collaboration reinforcing human connection grew bigger during the process of creating the installation-performance and during the writing of this thesis, eventually becoming an integral part of the research.

This introduction chapter continues with an autoethnographic introduction of the researcher from three different perspectives, followed by the context of this study. The second chapter opens up the key topics of this study: modified instruments, installation-performance, interdisciplinary collaboration, and artistic identity. These key words are further divided into smaller subcategories, accompanied with a literature review on earlier studies on these fields. The end of the second chapter discusses other artists working in these fields and maps out the lineage of work. Furthermore, these artists are mentioned as sources of inspiration for this project. The third chapter justifies the use of artistic research as a research method, discusses how research data was generated and analyzed, and opens up my position as a researcher and the ethical considerations involved in this research. The fourth chapter introduces a case study in three parts: the first part presents the ways that I have modified my bass clarinet, the second focuses on building a non-conventional multichannel loudspeaker setup, and the third part dives into the process and structure of the installation-performance *timbral frame*. The fifth chapter reflects and discusses experiences and insights from the process of creating and performing the piece, drawing data from the experiences of the whole working group. The sixth chapter acts as an outro for the study, presenting the findings and concluding the research question. Some avenues for future artistic work and research are also presented at the end of chapter six.

1.2 Introduction of the artist/researcher

As this thesis takes a look into the formation of an artistic identity and rationalizes certain artistic choices that I have made, it is important to introduce my personal, educational and professional background to give a better picture of the artist/researcher conducting this project. This introduction of the researcher is divided into three categories; musician, woodworker, and sound-oriented multidisciplinary artist, offering a timeline that explains the formation of my artistic identity prior to starting this project.

1.2.1 Musician

I grew up in a small countryside village outside Kuopio, in the Central-Eastern part of Finland. During my childhood and early teenage years, I listened to music that could be categorized under the wide umbrella of rock music. From this interest I took some guitar lessons, which were spent mainly learning some common guitar riffs. Besides those few years of guitar lessons and an odd one week kantele course (the two instruments that could have been studied in the village where I grew up), playing and practicing music was not really a big part of my life. I acknowledge the fascination with distorted guitar sound and riff-based music to have influenced me musically still to this day, but it was not until the age of 14, after trying out playing saxophone, that I started to gain a bigger interest towards music.

I kept saxophone studies as a hobby throughout my High School years, gaining valuable experience from playing in different ensembles. It was not until the last year of High School that I started to consider music more seriously. I applied for a two year degree in upper secondary vocational degree in music in Kuopio Conservatory, from where I graduated in 2018 with tenor saxophone as my main instrument. During those two years I played in multiple ensembles, performing music from a wide range of rhythmic music. My main interest as a saxophone player was to understand the language of jazz, but already by that time I was just as curious about the experimental and free jazz scene, spending a good amount of time studying extended techniques in addition to jazz vocabulary. By the end of the studies I got more and more interested in traditional music styles, studying, for example, Nordic folk music, Balkan music and Middle Eastern music. I also had the chance of

studying the Western silver flute as my second instrument, gaining wider interest in playing multiple woodwind instruments. I also started to compose my own music and worked with electronic effects and samples, finding an identity as a composer/performer who uses a combination of electronic elements and acoustic instruments as tools for sonic expression.

After starting studies in the Sibelius-Academy's Global Music Department in 2019, I developed my interest in a wide range of woodwind instruments coming from different parts of the world. During the first years of my bachelor's studies I also built a stronger connection with the bass clarinet. Some of the other instruments that I studied during those years include Indian bansuri, nordic overtone flutes, and Arabic ney. Besides being a music student, I've continued working actively as a freelance musician, leading my own projects and joining collaborations. During the last years, I've narrowed my focus to projects where improvisation, new experimentations and collaboration thrive. The main music projects from the past years include my solo project Jaakko Arola, improvising trio Nujakka and West African - Finnish ensemble Faso Kan.

1.2.2 Woodworker

During the years of studying multiple traditional woodwind instruments, I started to gain curiosity towards the art of instrument making. Although I was never particularly interested in handcrafts as a kid, growing up in an old countryside house surrounded by forest was an environment where I got used to solving problems with a do-it-yourself approach and fixing things with my hands. I first explored building wooden flutes on my own, but realized I was lacking knowledge. Luckily, as a part of my studies in Sibelius-Academy, I was able to join some instrument making courses to get guidance on factors such as acoustics and sound production mechanisms of woodwind instruments.

In 2022 I joined another instrument making course hosted by Sibelius-Academy, that time focusing on crafting instruments from natural material in a traditional way. On that course, as a first task, the teacher told the students to carve a wooden spoon in order to learn how to use a carving knife, before actually starting to build any instruments. During those two days of spoon carving, I absolutely fell in love with the craft of working with greenwood, the craft of using fresh unseasoned wood as material (Abbott, 1989). I had started to work with wood in

order to build instruments, but from that moment on I also started to craft different everyday objects with green woodworking methods. I started to carve spoons, cups and bowls with hand tools, and later I built myself a traditional wood turning device known as the pole lathe.

During my last year of bachelor's studies I was already deeply connected with woodworking, both in instrument making and in traditional woodworking. In 2022, after obtaining my bachelor's degree, I decided to take a gap year from music studies and focus more on woodworking. I had also partly lost my interest in musical performance practice prior that time, and found a new and meaningful connection with woodworking. I am quite a determined person, and when I take on a project to achieve something, I go for it full time. This one year gap turned into two years, as I moved to Sweden to study traditional woodworking in Sätergläntan institute for handcrafts. Other important factors affecting my woodworking and instrument making practices, besides the studies in Sweden, includes traveling to the UK to meet other makers in 2023 and 2024, field trip in Brazil to study the construction and techniques of pifano flutes in 2025, and a trip to Slovakia to study the craft of building traditional flutes in 2025.

1.2.3 Sound-oriented multidisciplinary artist

Joining art projects from fields outside of music has happened naturally to me, as I've been in close contact with people working in diverse disciplines. I've been collaborating in artistic projects featuring disciplines such as music, dance, theater and visual art. I've been a member of a multi-disciplinary working group Hieho Homma since 2018, where the roles of the performers change fluidly during the processes. My personal role has sometimes varied from a musician or sound designer to dancer or scenographer. Another multidisciplinary project that has shaped my artistic identity, questioning and expanding the boundaries of my artistic practice includes *Soft shifts* created by collaborating group Kauppila-Jauhiainen-Arola. This combination of an installation and a performance within it premiered in Joensuu in 2023 with continuation in Stockholm in 2024. In this project, I used self made instruments and electronic effects as my sound sources, exploring resonance and playability of everyday objects with structure-borne-drivers.

I consider myself to be a sound-oriented person, artistically and also in daily life. Besides creating sonic material and using sounds as means of expression, I consider sounds to define

a big part of my being. By drawing inspiration from the soundscape studies of R. Murray Schafer (1977), and acoustemology (Feld, 1982), I believe in the idea that listening is not just a sensory reception, but that sounds shape our understanding of the world. Moreover, I can relate with the concept of sonic citizenship (Breinbjerg, Højlund & Vandsø, 2024), acknowledging that sound affects individuals' social and environmental experiences and develops a sense of belonging in communities. Furthermore, being influenced by deep listening (Oliveiros, 2005), which draws attention to concentrated listening in artistic practice and everyday life, I believe that the sounds that I grew up with and the sounds that I experience in my daily life have an impact on my artistic choices and identity.

Besides active listening and relating to the world through my ears, I reflect upon the concept of embodiment, acknowledging that thinking and perception emerges from bodily experiences (Merleau-Ponty, 1962). This can happen on a concrete level when engaging in woodworking practices with my whole body, but also by focusing on the embodied knowledge and aesthetic perception (Jóhannesdóttir, 2024). I spent the vast majority of my time during the Master's studies abroad, living the first year in Sweden, having a one month field trip in Brazil during the second year, and spending the last semester in Iceland. Besides embodied experiences of physically spending time in different cultures and meeting people, I consider the cultural immersion that I have experienced in Finland through collaborating with artists from different cultures in the Global Music Department, as well as actively joining concerts and sessions of free improvisation and electroacoustic music to have shaped my way of being and the way of creating art.

Combining sonic arts practices and woodworking has been my main goal for the past year, and during this artistic research. Educated and deeply connected with both practices, I can't see myself anymore doing one more than the other. My current artistic practice includes exploring methods of combining two or more disciplines in a way that feels natural, trying to avoid a situation where they would integrate just for the sake of being considered multidisciplinary. Working with people who share a similar open mind to working with and across disciplines has impacted my personal practice. Now I find it possible, but also necessary, to be able to work with different approaches coming from different fields, instead of focusing and specifying my work under one category.

1.3 Defining the research area

Through this artistic research I explore multidisciplinary working methods and timbral possibilities of modified instruments from an autoethnographic perspective (Ellis, Adams, & Bochner, 2011). My past experiences include collaborating across the borders of disciplines, being immersed in different musical traditions and hands-on practice with instrument making and traditional handcrafts. All of these strategies have shaped my artistic identity and pushed me to explore other means of artistic expression. As a result, my artistic practice has flourished in ways such as modifying the timbre of my instrument through instrument-making methods, electroacoustic tools and extended techniques, and by investigating the intertwines between instruments and sound sculptures. All of these forms of expression and artistic practice have further influenced and shaped my identity. This reciprocal and mutually beneficial relationship between artistic identity and artistic practice acts as the starting point for this study, as I embark on finding ways of how they influence each other in my personal journey.

The research started as an autoethnographic study with the research question “*How can instrument modification and the implementation of handcraft methods give rise to new forms of sonic expression and strengthen one’s artistic vision?*” and later on expanded to include data from the collaborative process with the research question “*How can artistic work taking a starting point from individuals’ meaningful expression methods and collaborative creativity affect ones’ artistic identity and the artistic outcome?*”.

One of the main artistic outcomes and focus points of this study is an installation-performance titled *timbral frame*, which was created in a collaboration by four multidisciplinary artists. The installation-performance took shape in forms such as installation art, sound art, movement, sculpture, and spatial audio. The process of creating the piece took into consideration the practice of *interdisciplinary collaboration*, meaning that all presented art forms and disciplines influenced each other and were treated equally (Jensenius, 2022). The formation of the collaborating group took a starting point from human connection instead of focusing on the technical skills of each individual. Besides interdisciplinary collaboration, this thesis will also draw data from how non-artistic factors, such as shared identity or past experiences influence the collaboration and artistic outcome, drawing

inspiration from areas such as creative collaboration and socially engaged artistic practice (Renshaw, 2011; Lehtikoinen, 2025). I'm using experiences that the collaborating partners shared after the process through a survey, as well as my own personal reflections about the process and the interpersonal experiences.

I use the term instrument modification as an overarching term for the act of changing the timbre of an existing musical instrument with the intention of bringing out sonic qualities that feel closer to the player's own aesthetic preferences. The term modification, as explained by Oxford dictionary as "an act of making changes to something without altering its essential nature" (Oxford University Press, n.d), is in line with my own process of changing the instrument's timbre to resemble sonic aesthetics that feel more natural to my artistic expression, while keeping the instrument's original form present. My personal process of modification is inspired by traditional and experimental instrument making, electroacoustic signal processing, and from the rich variety of sonic qualities of traditional instruments. This practice is very close to fields of instrument augmentation (Lähdeoja et al., 2010), experimental musical instruments (Hopkin, 1996) and instrument preparation (Miller, 2006), and the term modification is used here as an overarching term for all of these disciplines.

I'm referring to the outcome of the case study as an *installation-performance*, a combination of a site specific installation and a performance taking place inside the installation. This formation breaks the structure and hierarchy between the audience and the performance, bringing the installation to the core of the piece and the audience and the performers to equally observe, relate and interact with it. The installation-performance *timbral frame* explores non-conventional multichannel loudspeaker systems, spatial audio, sound sculpture and the role of the physical material in the construction of sound art.



Image 2: Jaakko Arola and Elisa Sakko performing. Photo by Roman Odjinud.

CHAPTER II: Foundation

As mentioned earlier, this study investigates how artistic practice with sonic material and handcrafts affect the formation of my personal artistic identity. Additionally, it draws data from an interdisciplinary collaboration and from an installation-performance that holds traces from a wide range of artistic disciplines. Combining these different practices creates a wide range of terminology, therefore a brief look into the fields that integrate this artistic research project will give valuable data to answer the research question. Moreover, an overview of concepts, techniques and methodologies that have been used in the creation of the *timbral frame* will offer insight into the process. These methods are supported by reviewing earlier studies done in these fields.

This chapter presents four key topics of this study and the lineage of work. The first three key topics of this study, *instrument modification*, *installation-performance* and *interdisciplinary collaboration*, are seen as general terms with multiple subcategories in relation to this study. The last key topic, *artistic identity*, is viewed as an overarching theme that embraces the three earlier mentioned key topics, as they play a vital role in shaping my personal artistic identity. Finally, at the end of this chapter, examples of artists who work in similar fields are mentioned to map out the lineage of work where the artistic outcome of this study belongs to, and further mentioned as inspirational sources for the practice.

2.1 Instrument modification

Instrument modification is understood here as an umbrella term for the act of changing the sonic quality of an existing musical instrument as a product of personal artistic experimentation. There are multiple ways of changing the sonic quality of an instrument, as for example by changing its timbre through different playing techniques, or by physically modifying the acoustic body of the instrument. In this study, instrument modification is used as a compiling term that includes physical preparations, augmented instruments practice and extended techniques.

Following up the sonic explorations and research on instrument modification done on my bachelor's thesis, I've found that working globally in a diverse music scene can change the way the artists want to express themselves, and calls for further sonic forms of artistic expression, beyond the known sonic palette of an established musical instrument. Furthermore, I find that in my personal practice, as well as in the practice of many other artists in the field, the need to modify the sound of a musical instrument comes from the artist's own past experiences, aesthetic preferences and from the need to sonically correlate with one's own identity (Arola, 2022).

2.1.1 Augmented instruments

Instrument augmentation, also described as hybrid instruments or actuated instruments, can be defined as a practice of adding electronics to existing musical instruments in order to expand the instruments' sonic and expressive possibilities (Ângelo et al, 2018; Walstjin & Pedro, 2005; Lähdeoja, 2022). Instead of shifting the definition from instrumental practices under the definition of electronic music, instrument augmentation aims to preserve the tradition and playability of an instrument while simultaneously creating a possibility for electronic manipulation (Lähdeoja, 2022, p.120). In other words, the instrument's character and playing technique remains present, but instrument augmentation can change players' approach and forms of sonic expression through the implementation of technology.

In the case of an active acoustic augmented instrument, structure-borne drivers are connected to the body of the instrument, making it act as a loudspeaker, creating a possibility for one

instrument to perform electronic and acoustic sounds without external loudspeakers (Ângelo et al, 2018). When an electronic signal is sent to an augmented instrument that acts as a loudspeaker, an interplay between the acoustic and artificially enhanced overtones is achieved, referred to as two modes of sonic translation (Montes de Oca, 2022, p.87). When both a microphone and a transducer is attached to an acoustic instrument, a new timbre is created through an acoustic-aggregate-synthesis, where the original acoustic source collides with the digital signal (Clift, 2012).

2.1.2 Mechanical preparations

Mechanical preparations can be seen as attachments placed on the instrument that changes the acoustic timbre of the instrument. Instrument preparation is often associated with the Western contemporary classical music movements of the 1950's, taking a starting point from the works of Henry Cowell and John Cage (Miller, 2006). However, it is not the only or oldest tradition where instruments have been modified by adding something inside or around the instrument in order to change its sonic quality. In certain musical traditions and cultures these types of attachments can't be considered as external attachments separate from the original instrument, as they are a constitutive part of the style (Weisser & Quanten, 2011, p.125). Some examples include resonating metal elements added to instruments, such as djembe, sanza or mbira, in many parts of the African continent, metal rings attached to the body of the Iranian frame drum daf or the synthetic resonating strings in the Norwegian Hardanger fiddle (Merriam, 1962; Driver, 2017; Nasehpour, 2008; Bjørndal, 1956).

A study by Weisser & Quanten titled *Rethinking Musical Instrument Classification: Towards a Modular Approach to the Hornbostel-Sachs System* describes such attachments as *timbre modifiers*, elements that creates a sonic effect that becomes an integral part of the timbre of the instrument where they are used (2011, p.123). In this classification, the timbre-modifier is not dependent on a certain playing technique, and it does not take part in the production of the main vibration of the instrument (Weisser & Quanten, 2011, p.123). I return to the concept of timbre modifiers later in chapter 4.1, and present my personal approach to using them.

2.1.3 Extended techniques

Besides the implementation of technology and preparations, starting the modification from the player's technique instead of physically modifying the instrument, can be seen as a part of the act of instrument modification, and as a crucial part in the formation of a sonic identity. Diverse playing techniques of musicians from the genres of free improvisation and avant-garde shifted the ideas of what an instrument is capable of doing, forging a way for the field of extended techniques (Burtner, 2005). In the study *Instrumentalizing: Approaches to Improvising with Sounding Objects in Experimental music* Andy Keep refers to this search for new sounds in existing instruments, through implementing preparations and extended techniques, as *creative abuse*, an approach that explores the potential sonic palette of a sounding object or musical instrument by any possible way (Keep, 2009). In his doctoral dissertation, Colombian born cellist-researcher Sergio Castrillón talks about the act of modifying an instrument's sounds through different playing techniques as a *phenomenon of timbral re-signification* (Castrillón, 2019, p.30). Timbral re-signification can be achieved through *instrumental deconstruction*, which treats the instrument more as a sounding object, and by *re-instrumentation*, which draws influence from the techniques used for playing other types of musical instruments (Castrillón, 2019, p.31). I will present some of the extended techniques I use in my practice in chapter 4.1.

2.1.4 Combinations of disciplines

Although my personal practice with the bass clarinet contains electronic augmentation and audio technology similar to the practice of instrument augmentation, I use the term instrument modification to describe my approaches that take a starting point from using different timbre modifiers and mechanical preparations. These modifiers are influenced by cultural immersion, and study of different musical traditions, and are brought to life through my practice as an instrument maker and woodworker. Similarly, other artist-researchers have come up with compiling terms for their practice, that includes elements from multiple categories. In his doctoral dissertation, Hugo Morales Murguía examines how instrumental sound exploration affects his compositional process, referring to this work as *hacking traditional instruments*, a process that includes methods such as extended techniques,

structural manipulation of the instrument, and electronic amplification and signal processing (Morales Murguía, 2011, p. 17, fig 1.).

From an instrument making perspective, Koji Matsunobu found out through his case study *Instrument-making as music-making*, that students who are involved in the process of crafting their instruments form a deeper and more meaningful connection to their instruments (2013). Later on, in another study titled *Music making as place making: A case study of community music in Japan*, Matsunobu investigated how music making influences the sense of place making, arguing that among other positive factors, instrument making and music making may create a feeling of connection to environments and people, and form a stronger connection between the mind and the body (2018, p. 498). Additionally, instrument modification can be a powerful tool in music therapy, as mentioned in the article *Musical Instrument Modifications for Individuals With Neurodevelopmental Disabilities* (Yu et al., 2013). Although my research focuses on instrument modification in artistic practice from my individual experiences, I acknowledge its importance and potential in community engagement projects, and as a medium in music therapy. These areas also pose questions and possibilities for future research.

2.2 Installation-performance

In this study, installation-performance is seen as a piece where performance takes place inside an installation, a space where all of the surrounding elements interact and affect one another. The installation-performance *timbral frame*, which will be further opened up in chapter four, contains many elements from the fields of visual art, movement, and sound art, including installation art, sound sculpture, non-conventional multichannel loudspeaker system and spatialized audio. Emphasis is also given to the audience's embodied experience and immersive listening.

2.2.1 Multichannel loudspeaker system and spatial audio

In his doctoral dissertation Alejandro Montes de Oca explores how artistic practice can reach its full potential by implementing a *Case-Specific Electroacoustic System*, a set of electronic and acoustic elements interconnected for a specific sound work (2022, p.11). The case-specific multichannel system built for the *timbral frame*, as later explained in chapter 4.2, includes a sound sculpture and a set of handcrafted loudspeakers made out of wood and metal, with every loudspeaker having its own unique timbral quality. Alejandro Olarte discusses multichannel loudspeaker systems in his doctoral dissertation *Elements of electroacoustic music improvisation and performance*, and mentions three possible timbral scenarios in using more than one loudspeaker: making the loudspeakers act as homogenous as possible, treating every loudspeaker as a unique timbral quality, or by mixing similar and timbrally unique loudspeakers (Olarte, 2019, p.99).

The use of multiple loudspeakers as a sound source brings awareness to the acoustics and dimensions of the space it occupies. This is an important factor in the discipline of spatial audio, the art of creating a three dimensional listening environment. Richard Zvonar explains the lineage of spatial music in depth in his text *A History of Spatial Music*, mentioning that throughout the history, creating a space where the audience can hear the sound sources from multiple directions has been explored, for example, by placing the performers outside the standardized stage (Zvonar, 2004). With the rise of electroacoustic music in the 20th Century, the spatialization of the sound was explored by controlling a set of loudspeakers placed in

different locations in a room, resulting in the development of spatial audio technology and spatial music as its own genre (Macedo, 2015).

Through searching for diversity between the loudspeakers and by treating every loudspeaker as an individual timbral unit, a configuration of loudspeaker orchestra can be achieved (Olarde, 2019, p.99). Live diffusion of fixed media compositions through loudspeaker orchestras with different timbral qualities is an artistic practice that many composers and performers have been exploring, taking a starting point from the rise of *musique concrète* (Zvonar, 2004). In its essence, performing electroacoustic music through a loudspeaker orchestra relies on hearing the timbral characteristics of different loudspeakers, and how they interact with the performance space (Austin, 2001, p.23).

The usage of everyday objects as loudspeakers was developed by David Tudor and a group of sound artists known as *Composers Inside Electronics* (CIE), who investigated how objects' own resonant characteristics could be highlighted without playing these objects manually like any other instrument (Driscoll & Rogalsky, 2004). This was brought to life by making small resonant objects sound by activating them with structure-borne-drivers, each object creating a sound that is determined by its' physical material (Zvonar, 2004). Driscoll & Rogalsky, both members of CIE discuss Tudor's piece *Rainforest IV* in the article *David Tudor's "Rainforest": An Evolving Exploration of Resonance* and mentions Tudor having a "dream-vision of an orchestra of loudspeakers, each speaker being as unique as any musical instrument" (Tudor, 1984 as cited in Driscoll & Rogalsky, 2004. p.26).

Performances incorporating spatial audio takes the space into consideration as an important medium in the composition (Austin, 2001). By removing the one directional sound source, multichannel loudspeaker systems can activate the listener deeply and remove the hierarchy between the performers and the audience, creating an equal platform to observe and occupy the space (Matthews, 2019). Furthermore, it also activates the acoustic and architectural performance space to support and enhance the musical content (Amacher, 2020). Spatial performances are often site-specific, or the performance space is at least carefully taken into consideration as an important medium in the composition, becoming an integral part of the artwork (Baalman, 2010, p.209). The implementation of spatial audio and space as a medium in the installation-performance *timbral frame* will be opened up in chapters 4.2 and 4.3.

2.2.2 Installation art

The use of space is similarly an important factor in the constitution of installation art. Installation art has been growing since the 1960's, becoming a well established interdisciplinary field that challenges the autonomous existence of art and the experience of the public. Installation art is often large-scale and site-specific, and has created challenges for museums and galleries in preserving the art (van Saaze, 2013, p. 185). In the book *Installation art as experience of self, in space and time*, Vial Kayser and Coëllier aims to investigate the *phenomenal presence* involved in installation art, constituting of the embodied experience of the artist and visitor of installation art, in relation to space and time (2021, xv-xvi). Installation art invites the public to enter the space and observe it at their own pace. Installation space is not a gallery for displaying individual pieces of artistic works, it is a space that is considered as one piece of art with no separation between the objects and the environment (Reiss, 1996). Installations often incorporate multiple forms of art, and besides being visually observed, they evoke other senses, such as aural and tactile perception. Installations can also be divided into more defined subcategories, such as sound installation, textile installation and site-specific installation (Ouzounian, 2013; Thomsen & Angkjær-Jørgensen, 2025; Scholte, 2022).

It could be argued that as an art form, installation art is not fully complete without the visitor, and therefore installation art has processual and interactive character (Caldarola, & Leñador, 2024, p. 701). Factors, such as the position of the visitor in the space, and the time spent observing it, will create an unique perception of the piece, resulting in every audience member experiencing the art differently (Caldarola, & Leñador, 2024). Due to the immersive and participatory character of the art form, installation art calls for the artists to take into consideration the bodily feeling of the public in the space (Kühnapfel, Fingerhut & Pelowski, 2023). Installation art changes the traditional roles and hierarchy between the art and the visitor, decentering the art work to extend to the whole space, making the visitor the center of the piece (Vial Kayser & Coëllier, 2021, xx). The role of the audience in the process of creating the installation-performance *timbral frame* will be presented in chapter 4.2, and further discussed through reflections in chapter 5.2.

2.2.3 Sound sculptures

Sound sculptures refers to artistic works combining sculptural forms and incorporated sound production. The physical material of the sculpture can create sound on its own, acoustically through environmental or mechanical forces, or the sound can have spatial presence in the sculpture, for example, through sound technology. Sound sculptures started to gain more interest in the mid 1900's, but as the artistic movements such as avant-garde and postmodernism redefined and questioned the importance of definitions, according to Vadim Keylin, sound sculpture never managed to establish its own discipline (Keylin, 2015). In Keylin's hypothesis, in order to create a theoretic background for sound sculptures, it is important to focus on its connection to music, instead of separating those two (2015).

Keylin's article *Corporeality of Music and Sound Sculpture* addresses the thin line between sound sculptures and musical instruments, finding connection between these art forms through Harry Partch's idea of corporeal music, which is made out of three main factors: physicality of sound-making, audience engagement, and an immersive aesthetic experience that combines sonic and visual (Keylin, 2015). Harry Partch gave the sculptural side of his instruments as much attention as to their intonation, jokingly describing himself as a "philosophical music-man seduced into carpentry" (Partch, 1962, as cited in Keylin, 2015). The physical material and the way it is used affects the sonic quality of sound sculpture and the experience of the audience (Bradley, 2021). Therefore, knowledge of the material is important in the construction of sound sculptures, and it questions the traditional perception of music as immaterial art (Flø, 2018). As the physical material affects both the timbre of a sounding object and the space it occupies, hands-on practice with physical material can create new forms of art where the sonic side can be developed together with the physical and spatial aspect of the piece (Flø, 2018). I return to the concept of sound sculpture in chapter 4.2 and the importance of the physical material in construction of sound art.

2.3 Interdisciplinary collaboration and collaborative creativity

Collaboration is a crucial part of many artistic practices, which can be seen taking place when people work together through joining efforts, sharing resources, making decisions together, and sharing ownership of the final products (Helfter & Ilari, 2018). The collaboration involved in this study is viewed from the perspective of interdisciplinary collaboration, and emphasis is given on how connectivity and collaborative processes nurtures creativity.

2.3.1 Interdisciplinary collaboration

Huib Schippers divides modes in cultural exchange under four categories in his Continuum Transmission Framework (2010). With these definitions, Schippers describes *monocultural* exchange to have only one dominant culture, *multicultural* having multiple cultures coexisting but not blending, *intercultural* referring to multiple cultures contacting and loosely exchanging ideas, and *transcultural* to be a wide exchange of ideas where borders between single cultures might become ambiguous (Schippers, 2010). Collaboration between disciplines can be divided similarly to these categories, with *multidisciplinary* referring to a collaboration where each individual draws from their own disciplines knowledge, whereas *interdisciplinary* creates a synthesis of approaches where each discipline draws knowledge also from other disciplines (Jensenius, 2022, xvii). *Multidisciplinary* and *interdisciplinary* can have a very thin line between them, and are sometimes used interchangeably, however an important factor of *interdisciplinary* work is that the participants should be conscious about the holistic side of the process, and take into consideration the contributions of others in their decision making (Stember, 1991).

In this thesis, when discussing my personal practice, or the personal practice of my collaborating partners, I'm referring to *multidisciplinary artistry*. When discussing the collaboration between myself and the collaborating multidisciplinary artists in the project, I'm using the term *interdisciplinary collaboration* as a term to highlight that the collaborating project aimed on creating a common ground for all disciplines to interact with each other, not placing one discipline hierarchically higher, or participants only focusing on their personal discipline. In an artistic context, *interdisciplinary collaboration* can result in hybrid forms of expression that pushes the traditional boundaries of each individual form of art.

2.3.2 Collaborative creativity

Interdisciplinary collaboration is a new and complex phenomena that increases creativity, innovation and team performance (Moirano, Sánchez & Štěpánek, 2020). A study conducted by Peter Renshaw, examining ‘creative collaborative learning’ in the Barbican-Guildhall Campus in London, acknowledges that successful collaboration needs to have a chance to evolve naturally instead of being forced (Renshaw, 2011, p.11). Renshaw recognizes collaboration as a powerful catalyst for creativity that can’t be accomplished alone, but by people who choose to unite and be open to change their perspectives on the world by highlighting the diversity of skills, viewpoints and knowledge in the group (Renshaw, 2011, p.18).

Connective creativity, as described by Choi-Fitzpatrick & Hoople, is “the product of individual imaginations working together to bring something fresh and tangible into the world” (2024, p.6). This type of collaboration takes starting point from building a community and trust between the participants, and highlights that the creation of shared identity between the members cultivates a sense of psychological safety, which allows the members to feel more comfortable to voice their ideas and take risks that helps to push the artistic work further (Choi-Fitzpatrick & Hoople, 2024). Collaborative creativity researched from the perspective of dance and movement-based practice acknowledges it as not just mental, but bodily practice, where understanding of sensory micro-dynamics between the collaborators is vital for creativity (Blomberg, Satama & Warren, 2022, p. 167).

Creative processes taking a starting point from non-artistic factors, such as shared identity, community building or past experiences, is at the core of community engagement practices. By shifting the focus away from the skillsets of the participants, a space for different approaches to thrive is created, fostering room for multidisciplinary or interdisciplinary collaboration to take place. Similarly, socially engaged artistic practice involves collaboration, social interaction and community building as key elements for the practice, and empowers participants to shift from passive observers to co-creators who have a significant role in shaping the final product (Lehikoinen, 2025, p. 31). I return to the topic of creating artistic work through collaboration in chapter 4.3, and use the term *collaborative creativity* as a compiling term for the practice.

2.4 Artistic identity

Identity is a wide topic that has been researched from multiple angles, for example, from the perspective of identities constructed by culture, geography, language or gender (Hall & du Gay, 1996; Edwards, 2009; Briggs, 2023). In this study, artistic identity is used as an overarching term for a view of an artist's own identity that is constructed and influenced by elements, such as forms of artistic expression, collaboration, and preferences. The sense of identity can change fluidly from context to context, and can be influenced by social and cultural environments (Frith 1996; Bauman, 2001). The terms self and identity are sometimes used in similar situations, but are not interchangeable, as self can be seen as an internal and subjective feeling constructed of multiple identities that one can choose to express in different situations (McAdams et al., 2021).

Hargreaves, Miell and MacDonald identify musical identities and their importance, by pointing out that instead of having one core identity, people can have different identities that are constantly changing and being shaped by human interactions (2002, p.10). Alison Bain's research *Constructing an Artistic Identity* draws data from interviews held with 80 visual artists based in Toronto. Although the study focuses on factors such as the effect of steady income and historical myths of artists working in isolation, Bain acknowledges how human interaction between other artists shapes the identity, and how artists informally function as resources for each other (Bain, 2005, p. 42). Moreover, identity can be a combination of multiple factors, as "instead of a single self with enduring, deep, and abiding qualities, we possess multiple selves (gendered, racialized, ethnicized, nationalized, and so forth) whose expression is contingent on particular contexts and specific performances of the self in those contexts" (Rice, 2007, p. 27).

A distinctive musical voice or a personal approach to playing an instrument can be described as a musician's sonic identity, which can become an essential part of the overarching artistic identity constructed and shaped by elements such as intercultural dialogue, collaboration, surrounding environments and musical aesthetics (Thomson, 2021, p.19). Artistic identity is formed by a deep dedication to the artistic practice, personal growth and enthusiasm for persistently exploring new forms of artistic expression (De La Puente Vadillo, 2024, p. 188). In the discipline of movement based practice, the somatic feeling of one's own body,

achieved through embodied exercises, constitutes to the identity of a dancer, which is additionally formed in relation to the other bodies in the shared space (Albright, 1997). Artistic identity is an ever changing phenomena, and in the words of Simon Frith “identity is not a thing but a process” (Frith, 1996, p.110). This research does not aim to come to a concluding statement and defined list of factors that have shaped my artistic identity, but rather act as a self reflective accompaniment for the process.

2.5 Lineage of work

This section gives a brief overview of some of the other artists working in the fields of modified instruments, installation-performance and interdisciplinary collaboration, contextualizing and placing this study and related artistic outcomes into a lineage of work. As suggested by Nelson, in the context of artistic research “the location of work in a lineage of practice might be more appropriate than a literature review (though it is typically a matter of ‘both-and’)” (Nelson, 2013, p.35). My artistic practice emerges at the intersection of instrumental practice, electroacoustic performance, handcrafts, installation work and sound art. I am mixing these approaches and disciplines together in my personal practice, and often in dialogue with other artists in collaborative processes. It is influenced by a lineage of artistic work and approaches to sonic expression, and collaborations that have pushed the boundaries of performance and audience experience.

Discussed methods of modifications with wind instruments have been researched and shared under their subcategories. As an example, Lee Russell offers a wide list of some of the common preparations for the transverse flute used in Western classical music repertoire (Russell, 2011). Mikko Raasakka’s book *Exploring the Clarinet* opens up in-depth some of the extended techniques used in the field of contemporary classical music (2010). With a focus on the bass clarinet, Sarah Watts explains in detail the theory of multiphonics on the bass clarinet with a spectral analysis of the phenomena (2015). Throughout the 19th Century, bass clarinet often got considered as a doubling instrument in the orchestra, but claimed its position as a strong individual instrument in the contemporary scene during the second half of the 20th Century, with clarinetists, Josef Horák and Harry Sparnaay as pivotal players in this shift of perception (Molinos, 2023, p.26). Mikko Raasakka refers to this transition towards a soloist instrument as the “emancipation of bass clarinet” (Raasakka, 2010, p. 87).

In the context of jazz, global and experimental improvisation, artists like Eric Dolphy, Christer Bothén, Evan Ziporyn and Alex Simu have brought the bass clarinet forward as a versatile tool that can be used in many musical contexts, and have moved the expectations of what the instrument is capable of doing. Wind players such as Evan Parker, Colin Stetson, Bendik Giske and John McCowen have all pushed the craft of woodwind playing further by exploiting their sonic palette through extended techniques that allows polyphony on a monophonic instrument, using endurance as a means of expression through long lasting performances implementing circular breathing, as well as capturing the spatial feeling of the acoustic instrument by exploring different microphone set-ups. By implementing technology, research with augmenting a bass clarinet has been conducted, for example, with the sensor augmented bass clarinet SABRe (Schiesser & Schacher, 2012), and with feedback-augmented bass clarinet (Panariello & Percivati, 2023).

Mouthpiece modifications that can change the sound production of a Western instrument to be similar to that of a traditional instrument has been explored with new head joints for the silver flute. Some examples include shakuhachi head joint ‘shakulute’, quena head joint ‘queflauta’, or a kaval head joint, both fipple and end-blown, all modifications that utilizes the body of the Western silver flute and its’ playability, but changes the sonic quality of the instrument completely (Wataru, 2003; Cordova, 2010; Milchev, 2025). Another relevant example to my own work with changeable mouthpiece modification, with the intention of bringing sonic aesthetics from the players own background, is present in Hungarian jazz saxophonist Mihály Dresch’s work with creating an instrument titled *fuhun*, a flute that resembles the sound of Transylvanian flutes, while maintaining the playability of a saxophone (ZENÉSZ, 2024).

In his artistic work, Nathan Riki Thomson uses a combination of mechanical preparations, extended techniques and electronic augmentation on his double bass (Thomson & Lähdeoja, 2019, p.33). Throughout the process of exploring these modifications, Thomson states that his double bass has become a hybrid form of an instrument, which traces elements from the tradition as well as from the new added elements (Thomson, 2021, p.135). Augmented instruments have been used as tools for musical expression in recordings and live-performances. For example, *Electronic Chamber Music* group uses augmented double-bass, acoustic guitar, violin and modular synthesiser (*Electronic Chamber Music*, 2018). Moreover, as stand-alone sound sculpture, the *Superguitar_03* project by Alejandro

Montes de Oca has four hanging guitars with structure-borne transducers attached to their body and strings (Montes de Oca, 2022). Hugo Morales Murguía's work with hacking traditional instruments ranges from solo instrumental explorations, like *Modes of assisted Ventilation for intubated flute and electronics* from 2014, to large scale collaborations with disciplines such as theater and dance, combining elements from performance art and installation, like in the piece *Automatic Means of Human Labour for 2 musicians and modified machinery* from 2023.

Intertwining with the modified instruments, my installation work draws attention to the physical material that is used to present sound art, and the space as a medium that affects the whole experience. With the adaptation of a non-conventional loudspeaker system I draw attention to the role and timbral qualities of physical material, but also attention to the instrumental performance as a spatial electroacoustic unity that merges into the space and the installation. As mentioned earlier, stemming from David Tudor's Rainforest, structure-borne drivers have been used to bring out resonant characters from everyday objects in installation pieces, but they have also been used as loudspeakers in performances. Giorgio Magnanensi, composer and the artistic director of Vancouver New Music built a set of audio-panels from discarded pieces of cedar wood and transducers to be used as the soundsystem for a live performance in his 2017 project West Coast Radians. CHRONOVARIATIONS by Finnish saxophonist Heli Hartikainen in collaboration with sound artist Esther Calderón Morales uses a set of loudspeakers made out of scrap metal, providing an immersive listening experience by spatializing the sonic world of the saxophone and live electronics in the space.

Some of the first sound sculptures are usually considered to be the instruments built by the Baschet Brothers in the 1950's. These two French artists started to build sculptural instruments with the intention of creating new instruments more suitable for modern times (Litch, 2019). The artistic creativity with sound sculptures might move from the musical mind towards sculptures, like with the Baschet Brothers, but also the other way around like in the case of Harry Bertoia (Keylin, 2015). Years of working with the steel rods as a material for chairs and other non-sounding objects made Bertoia become aware of the sonic possibilities of the material. Concrete hand-on knowledge of the material from non-musical perspective allowed him to craft sculptures with a deep tone and striking visuality (Keylin, 2015).

Pieces considered sound sculptures may produce sound through different methods. The sound of Bertoia's sculptures comes alive with freely swinging metal rods. Some pieces can become sonic when air passes them, like in the case of *Singin Ringing Tree* from 2006 by Tonkin & Liu. Others produce sound by using the combination of electronic signal and acoustic resonating material, like Bernhard Leitner's *Tuba Architecture* from 1999, and some need a human to operate them, like for example, *Harry Partch's instruments*. Swiss sound artist Zimoun uses rotating motors attached to cardboard boxes and other everyday items on his pieces, like *658 prepared dc-motors, cotton balls, cardboard boxes 70x70x70cm* from 2017. The soundscapes in his pieces are produced by the whirling sound of the dc-motors combined with the sounds of rotating objects hitting a surface (Albritton & Zimoun, 2013). The added visual effect of hundreds of similar pieces rotating in the space makes his art pieces exist somewhere in the lines of kinetic art, sound art and sound sculptures.

Discussed fields of sound sculptures, modified instruments, spatial audio and installation art all carry traces from one another, and intertwine with each other. All of these fields include certain elements from other disciplines, and many of the examples mentioned earlier can be seen filing under multiple definitions. These pieces become hard to describe with one term, and some artists and researchers have found other terms to describe these combinations of works in these fields, using terms such as *composition-installation-sculpture* (Montes de Oca, 2022), *object-based sound installation* (Rose, 2013) or *instrumentallation* (Obici, 2019).



Image 3: Otso Kauniskangas performing. Photo by Alisa Khodos.

CHAPTER III: Research design

3.1 Research methods

This study follows an artistic research approach, meaning artistic practice processes involved in this study, such as instrument modification, exploring different sound sources, interdisciplinary collaboration and building an installation-performance, are all considered as methods of research. Therefore documented work in progress, new artistic discoveries and artistic outcomes are treated as valuable research data. The practice with above mentioned processes culminated in an installation-performance *timbral frame* that took place in May 2025. Instead of focusing only on the final installation-performance presentation, this research draws data from the whole process, acknowledging it as an important source of data for answering the research question. Many valuable insights emerge during the process of creating artistic work, therefore documentation and analysis of the process becomes an important method for artistic research (Nelson, 2013, p. 28).

Other terms coming from slightly different perspectives, but categorizing under the wider umbrella of artistic research includes terms such as practice-led research, creative research, practice-based research and practice as research (Smith & Dean, 2022). In the essence of artistic research “the artist produces an artwork and researches the creative process, thus adding to the accumulation of knowledge” (Hannula, Suoranta & Vadén, 2005, p. 5). Artistic research places importance on tacit knowledge, acknowledging that certain skills are learned unconsciously and can be difficult to fully explain in words (Schindler, 2015, p. 2).

Investigating the *lived experience* is central to the philosophical movement of phenomenology, which later has become an important aspect for qualitative research and artistic research (Williams, 2021; Himanka, 2022). At the intersection of phenomenological practice and artistic research, I also draw on autoethnography, an approach to research that seeks to analyze researchers' personal experiences in order to understand certain phenomena (Ellis, Adams & Bochner, 2011). While phenomenological research can draw data from the lived experiences of other participants, autoethnography focuses solely on the personal experiences of the writer, and puts them into conversation with the experiences of others. In

this study, autoethnography is used especially in chapters 1.2 and 4.1, when discussing my personal practice and the formation of my personal artistic identity.

According to Patricia Leavy, there are three primary approaches for creating artistic research data: collecting data from participants, creating art and the art piece becoming data, and projects where the artistic practice is both method and data (Leavy, 2017. p. 197). In this study, these three methods are all used in different stages. Certain data is collected from the participants, in this case data collected from an anonymous survey sent to the working group. The installation-performance created by the whole working group, as well as the process and practice prior to the performance are documented and analyzed as data. Data is drawn both from the perspective of the collaborating group and from the autoethnographic view of the researcher.

Instead of separating artistic research and artistic practice as different processes, Smith and Dean acknowledge their reciprocal relationship and illustrate them to be interwoven in an *iterative cyclic web* (Smith & Dean, 2022, p.20). In this artistic research I have developed the artistic practice further with a cyclical iterative method and reciprocal approach between artistic practice and artistic research. The implementation of the iterative cycle process within the artistic practice is unfolded in detail in the following section of this research.

3.2 Data generation and analysis

The data generated throughout this artistic research includes artistic work, documentation of work in progress, email and text message exchange with the collaborating partners, informal discussions during the rehearsal period, anonymous feedback, and survey responses. The generation and analysis of data happened simultaneously, affecting one another in a mutually beneficial manner. The data has been analyzed through iterative cycles with reflexive thematic analysis and through incorporating an internal dialogue (Leavy, 2015).

3.2.1 Collected data

Literature review	Modified bass clarinet	Multichannel loudspeaker system and sound sculpture
- reviewing written literature from the field	- videos - pictures - sketches - audio recordings	- videos - pictures - sketches - text - informal discussions
Creating material and structure for the piece	Interdisciplinary and connective collaboration	Installation-performance <i>timbral frame</i>
- video - audio - notation - text - informal discussion	- video - pictures - audio - informal discussions - survey	- multitrack recording - video recording - pictures of the installation - audience feedback

Figure 1: Collected data.

3.2.2 Analysis

1. *Video and audio recordings of work in progress:* All of the sessions with collaborating partners were recorded and listened back afterwards. Artistic ideas that emerged in those processes were marked down with timestamps matching the recordings. Resonating moments that felt like starting points for new discoveries were revisited

and further analyzed. These moments were shared with the collaborating group, and were used as a base for structurizing the performance and developing the compositional ideas further. My personal improvisation-based experiments with the modified bass clarinet were also recorded and listened back to with a reflective focus.

2. *Iterative process of experimentation and improvisation:* Observations of recorded rehearsals were used as a tool to find resonating moments and potential ideas to develop further. This was done through an iterative process where the piece was developed in cycles, improving each cycle based on the previous. In my personal practice I would listen through these moments and start improvising on top of the recordings or directly after. This improvisation would again be recorded and analyzed later. This created a cyclical form, where the analysis of previous artistic moments influenced new forms of expression, which later was again analyzed and taken further through experimentation and improvisation. This approach was also used in the collaborative process by listening together through previous rehearsal recordings and discussing our observations from the process.
3. *Discussions, message exchanges and survey answers:* Informal discussions taking place during the recorded sessions, email and text message exchange, and the reflective survey were used to find out how the artistic practice developed in the collaborative process.

3.3 Researcher position and ethics

The main motivation of this artistic research is my personal need to be able to combine the different artistic disciplines that I use, and to understand how these diverse approaches can be used simultaneously in a way that feels natural. Through this study I have also researched other artist practices, art works and methods that combine multiple disciplines. This takes part in the ongoing formation of my artistic identity as an artist working in the intersection of sonic arts and visual art. Every artistic work has a voice, and this personal fingerprint can be used to assess artistic research (Leavy, 2015).

The collaboration is viewed from the perspective of *interdisciplinary collaboration*, where all disciplines exchange ideas and have equal value to the final outcome. I acknowledge that my position as a facilitator of the project, and the fact that the installation-performance acted as a final performance for the Master of Music degree, might have given more emphasis to sonic based material on the overall timeline of the project.

This study is committed to follow the European General Data Protection Regulation mentioned in the 2023 Finnish National Board on Research Integrity guidelines (TENK, 2023). All of the people in this research participated voluntarily. All of the participants were provided with a consent form with explanations of the research process and their position in the study. The consent form provided for the participants is attached to the appendices section of this research. The participants were given the opportunity to remain anonymous in the study, and the right to withdraw from the study at any given point. All of the participants chose to have their identities revealed in the sections discussing the process of creating the installation-performance. With a mutual agreement between the participants, we chose to process the survey answers in chapter 5.2 five anonymously.



Image 4: Noora Arola performing. Photo by Roman Odjinud.

CHAPTER IV: Installation-performance *timbral frame*

This chapter will take a look at the installation-performance *timbral frame* as a case study, which will be observed from three different perspectives. The first part will open up my personal explorations with modifying the sound of the bass clarinet. The second part will discuss the process of creating a non-conventional multichannel loudspeaker system and a sound sculpture, complemented with an analysis on the playing techniques used for the sound sculpture. The third part will open up the process leading towards the performance and the structure of the piece.

This collaboration eventually became interdisciplinary by its nature, but was initiated by forming a group based on friendship, past experiences and shared identity. The collaborating group consisted of four artists, myself, sound artist Otso Kauniskangas, visual artist Elisa Sakko and dancer-musician Noora Arola. A short biography of the four artists collaborating in this project can be found in the appendices section of this research, on the third page of the Appendix 2: programme notes.



Image 5: The installation space. Photo by Elisa Sakko.

4.1 part one: the modified bass clarinet

This chapter introduces some of the ways that I have been exploring modifying the sound of my bass clarinet, focusing especially on the modifications that I used in the installation-performance *timbral frame*. This section will include technical descriptions of the modifications, as well as my personal artistic choices for using these modifications. A brief introduction is also given to some of the extended techniques that I use in my practice. Implementation of these modifications to the final installation-performance is opened up in the third part of this chapter.

4.1.1 Alternative mouthpieces

The classification of a woodwind instrument is determined by the mechanism that converts the air flow from players lungs into oscillating air flow in the mouthpiece (Wolfe & McPherson, 2022). In the clarinet, the reed acts as this mechanism and serves as the main element in creating the clarinet's characteristic timbre. If sound is produced through any other way, the timbral quality will change, although the body of the clarinet can still be used to alter the pitch. Building on this understanding, I began exploring alternative mouthpieces for the first time in 2022. This section introduces two mouthpieces inspired by traditional woodwind instruments that I have been studying: a mouthpiece inspired by Japanese end-blown flute shakuhachi and a mouthpiece inspired by Slovakian overtone flute Fujara.

According to Weisser & Quanten, fundamentally all instruments are made out of two parts: an exciting element and an amplifying element (2011, p.133). In their framework, the earlier mentioned *timbre modifiers* do not change the exciting or amplifying element, but rather enhances their configuration (Weisser & Quanten, 2011, p.133). In contrast, this study proposes an alternative approach to timbre modifiers: mouthpiece modification that changes the exciting element itself. The timbral quality of the instrument changes through this modification, and furthermore shifts the clarinet within the subcategories of woodwind instruments from a reed instrument to the classification of a flute. This modification preserves much of the instrument's visuality and playability, but transforms the instruments into a hybrid form due to its modified timbre.

Shakuhachi mouthpiece

The shakuhachi mouthpiece is handcrafted from a piece of wood with a sharp blowing edge known as *utaguchi* on one side, and a round tenon the same size as in the regular bass clarinet mouthpiece on the other side (see Image 6, p. 43). When the sound is produced with this modified mouthpiece, the bass clarinet becomes a long end-blown flute with a characteristic airy timbre. The sound can also be altered with the common shakuhachi blowing techniques of *meri* and *kari*. The wider bore diameter and the length of the bass clarinet makes it difficult to reach the lowest notes of the instrument, but the response rate is strong on the middle register, with the additional possibility of overblowing the harmonic series. Additionally, the keys of the bass clarinet can be used to play melodies in three octaves. The pitch of the instrument with the alternative mouthpiece is not tuned anymore to the western equal temperament, but can be compensated with false fingerings techniques and changes in the embouchure. I used the shakuhachi mouthpiece in the first section of the installation-performance *timbral frame*. The implementation and structure of this section is further opened up in section 4.3.2.

Bass overtone flute mouthpiece

The second mouthpiece modification used in the installation-performance *timbral frame* is a handcrafted wooden bass overtone flute modification. With this modification, the sound is created through a fipple. The inspiration for this modification came from the Slovakian bass shepherds flute Fujara, an instrument with a long tradition that has been inscribed to the UNESCO Intangible Cultural Heritage list (UNESCO, 2008). Traditionally, Fujara is constructed from one piece of solid wood, with the length of the flute ranging between 160 and 200 cm. In 2025 I traveled to Slovakia to meet instrument makers and to personally observe how the instrument is constructed.

The body of the bass clarinet has a length similar to a mid-range Fujara. As the bass clarinet features more keys than Fujara (or other common overtone flutes), it is possible to alter the root note from which the overtone series are overblown. The keys of the clarinet can also be used to play melodies, similarly as described with the shakuhachi mouthpiece. The fipple of the overtone flute mouthpiece faces downwards, towards the chin of the player. This allows for a technique of partly covering the soundhole of the fipple with the player's lower lip,

resulting in a buzzing and turbulent sound (Clement, 2016). This technique is commonly used in the playing style of Transylvanian shepherds flutes and Romanian fipple kaval.



Image 6: Mouthpieces for bass clarinet. Photo by Jaakko Arola

Left to right: Bass clarinet mouthpiece (manufacturer: Henri SELMER Paris), shakuhachi mouthpiece (maker: Jaakko Arola), overtone bass flute mouthpiece (maker: Jaakko Arola)

4.1.2 Microphone set-ups

Contact microphones detect vibration from the resonating surface of the instrument, instead of capturing the sound through sound in air. They are commonly used for many string and plucked instruments, but are not often used with instruments such as clarinet or flute due to the minimal resonance in the body of a wind instrument. Moreover, contact microphones attached to a wind instrument amplify the sounds of the key mechanism more easily than the sound produced by blowing. This makes them a weak candidate to be used for capturing the natural acoustic sound of the instrument, but a great option for amplifying sounds from the keys of the clarinet that usually get neglected.

Being fascinated by the percussive sounds that the key mechanism of the clarinet creates, I started to investigate using contact microphones placed into different areas of the instrument. The final modified microphone set-up developed during this research consists of four contact microphones and three condenser microphones. In the following section, I will explain the implementation of this microphone set-up and the reasoning behind their choice.

Contact microphones on the pads of the bass clarinet

The first contact microphone modification amplifies the key mechanism of the clarinet. Rather than being attached to the buttons pressed by the fingers, the contact microphones are placed on the round metallic plates, known as pad cups, that cover the tone holes of the instrument. This configuration captures and amplifies low percussive sounds, achieved by filtering the audio signal by reducing high frequencies and amplifying the low frequencies on the equalizer.

In my setup, two contact microphones are used on two different pads, C and Bb in the middle register. This placement triggers the sound by two different fingerings, the left hand ring finger and the right hand index finger. The microphones capture the sound both when the key is pressed down and when it is released. The depth of the first sound can be emphasised by applying greater force than usually would be necessary. The release produces a more subtle sound.

This setup enables a wide range of rhythmic possibilities and offers compositional tools. Sometimes I begin to develop an idea, such as repetitive patterns acoustically, then activate the microphones to see how the pattern evolves. As the microphones are emphasising only certain notes, the resulting low frequency percussive groove might accent beats that differ from the way that I would naturally compose rhythmic elements. Counterwise, I might begin by creating a pattern with the amplified pads before introducing a pitch from the clarinet. Sounding out the pitch only after the percussive groove is established can result in unexpected melodic lines. This modification can offer a new and fresh perspective for composition.

Contact microphones on the body of the bass clarinet

In addition to the contact microphones on the pads, I also explored attaching them directly on the wooden body of the bass clarinet. This placement picks up the sound of multiple keys on that specific area. Instead of enhancing the low end of the sound spectrum, the signal is unfiltered, resulting in a clinking sound. In a performance situation, a wider timbral palette can be accessed by alternating the equalization of the signal to either boost or lower the higher frequencies. A contact microphone attached to the wooden body of the clarinet picks up the sound of multiple keys at the same time, and therefore this modification can be used to bring out more rapid patterns.

Contact microphone placed on the throat

A third contact microphone that I use does not actually amplify the bass clarinet, but the human voice. This microphone is placed directly against my throat and it amplifies my voice while I'm playing the instrument, allowing a possibility to sing melodies on top of the bass clarinet pattern.

The simultaneous use of voice and wind instruments is a widely used method in many traditional and modern music styles. Some examples include the use of voice in Australian Indigenous Yidaki (didgeridoo) playing, growling saxophone playing in rock music and classical clarinet playing techniques referred to as *colla voce* or *con voce* (Tarnopolsky, et al., 2005; Raasakka, 2010). In these contexts, the performer's human voice resonates through the instrument's body and blends together with it, creating a sonic texture that is often considered as one mass of sound.

It is possible to sing a large range of melodies simultaneously as playing a wind instrument, only limited by the performer's technical skills and range. However, as the sound of the human voice merges together with the sound of the instrument, these melodies can be hard to distinguish clearly. Amplification of wind instruments further mask the human voice, as standard microphone techniques typically favor the sound of the instrument.

A contact microphone placed on the throat, also known as laryngophone, offers an alternative for capturing the simultaneous human voice. Although uncommon in musical context due to its tendency to muffle the sound, laryngophones have been used to amplify the human voice in extremely noisy work environments as they can isolate the human voice from the ambient sound.

Amplifying the human voice under the sound of the instrument is investigated in Ken Ueno's composition *I screamed at the sea until nodes swelled up, then my voice became the resonant noise of the sea* from 2006. This piece written for solo amplified Bb clarinet has, in the technical requirements of the composition, a microphone placed closer to the mouthpiece to capture the sound of the human voice (Ueno, 2006). From my research, I would argue that using a laryngophone is better to capture the voice with less of the direct sound of the acoustic instrument. In a musical context, vocal percussionist Jeff Thacher uses a contact microphone on his throat on recordings and live performances to amplify percussive grunting sounds that a vocal microphone could not pick up (Small, 2000). Within the context of wind instruments, the method is well executed in the technical set-up and compositions of American saxophonist Colin Stetson, who creates eerie melodies by singing high pitched tones on top of the low bass saxophone (Herald, 2017).

As mentioned by clarinetist-research Mikko Raasakka, there are two types of *colla voce* techniques: "1) 'duets' between instrument and voice, where the focus is on the harmonies the two produce; and 2) vocal effects, where the focus is on their combined colour effect" (Raasakka, 2010 p.57). With the throat microphone modification, the first method can be enhanced in a way that allows the voice and the instrument to be separated into two clearly different distinctive sound sources. This creates a possibility for polyphonic and contrasting melodic movements to occur.

Combination of microphones

The full microphone set-up that I used for my modified bass clarinet in *timbral frame* included five contact microphones and three condenser clip-on microphones. Two contact microphones were placed on the pads of the clarinet, two on the wooden body of the clarinet and one contact microphone on my throat. The three clip-on DPA condenser microphones were divided to cover the long length of the bass clarinet, one connected to the bell of the

clarinet to amplify the lowest notes of the instrument, second one located in the middle of the clarinets' body, and third one aimed directly towards the mouthpiece to amplify the modified mouthpieces, and to capture some sounds of the breath.

The combination of contact microphones and condenser microphones allows a wide range of sounds to be captured. Enhancing the percussive patterns of the keys and the human voice simultaneously while playing the bass clarinet creates a possibility of creating rhythmic grooves and polyphonic melodies from an instrument which has been historically considered monophonic. These explorations have affected my expression palette with the bass clarinet and influenced my compositional processes.



Image 7: Contact microphones attached to the pads. Photo by Jaakko Arola.

4.1.3 Extended techniques

As briefly stated in chapter two, extended techniques exist in their own field in many instrumental (or vocal) practices, and do not necessarily file under instrument modification. Nevertheless, the application of extended techniques changes the traditional timbre of the instrument, tracing similarities to my personal explorations with physical instrument modification.

This study does not aim to open up these techniques or list all possible approaches to extended techniques on the bass clarinet. The extended techniques of this instrument within contemporary music has been detailedly researched by multiple artistic-researchers (see, for example, Bok & Wendel, 1989; Watts, 2015). Some of these extended techniques will later be mentioned when discussing the performance, and therefore they are briefly mentioned under this section. A few extended techniques that I used in the performance which could be achieved without additional instrument modification includes:

- a.) *multiphonics*: producing two or more pitches simultaneously from the instrument.
- b.) *circular breathing*: continuously playing the instrument while inhaling air.
- c.) *slap tongue*: a strong percussive accent created by releasing a vacuum produced by the tongue against the reed.
- d.) *key clicks*: utilizing the sounds of the key mechanism of the clarinet.
- e.) *air notes*: breathing through the instrument without creating a pitch.

4.2 Part two: multichannel loudspeaker system and the sound sculpture

While walking in Töölönlahti, Helsinki during one morning in February 2025 I saw arborists cutting down Maple trees next to a café. With the permission from the arborists and the owner of the café I was able to collect some fresh timber for handcrafting. The heartwood of the Maple was partly rotten and had a very dark brown colour. Even though the timbre was partly weak on porous, it was visually so striking that I decided to use it for building a set of wooden loudspeakers. Through this process, I was able to implement handcraft approaches to my sonic based practices.

The complete multichannel loudspeaker system created during this artistic research consists of seven wooden loudspeakers built by myself and two metal plate loudspeakers created in collaboration with visual artist Elisa Sakko. Additionally, a metal sculpture built by Elisa Sakko was turned into a sound sculpture by myself and sound artist Otso Kauniskangas. This section will discuss the process of building these unique loudspeakers and the sound sculpture. The sound sculpture is used as a part of the multichannel loudspeaker system, as well as an instrument on its own. Playing techniques for the sound sculpture were developed in collaboration with Otso Kauniskangas and Elisa Sakko, and they are described in the section 4.2.3. The final section of this chapter opens the implementation of these loudspeakers and sound sculpture in relation to the installation by discussing the case-specific signal route and installation layout.

4.2.1 Multichannel loudspeaker system

Hanging bowl loudspeakers

The multichannel loudspeaker system included three bowl shaped loudspeakers that were hanging from the ceiling. These loudspeakers were turned to the shape of a hollow form bowl on the pole lathe, a technique and a shape that I had been investigating deeply during my studies in Sätergläntan. The rotten part of the wood was left on the opening side of the bowl for visual purposes, and a loudspeaker element was inserted in the opening. The speaker cable entered the interior through a small hole and was sturdy enough to carry the whole weight of the loudspeaker. The empty space inside the bowl was filled with speaker foam and

the element was attached to the rim of the bowl with silicone. Two bowls had an opening fitting a 4 inch 8 ohm full range woofer. One bowl had a larger diameter, and a 5 inch 8 ohm bass-midwoofer was used as the element. In the installation, these loudspeakers were located behind the audience, hanging from the ceiling of the installation space.



Image 8: Hanging bowl speakers. Photo by Jaakko Arola

Wooden bark loudspeakers

The loudspeaker system included three loudspeakers at the floor level that were located in a semi-circle between the audience and performance area. These loudspeakers were made out of a half of a log of a Maple tree. The log was first split in half and the interior was carved out with hand tools such as axe, adze and gauges, following the process of carving a Swedish dough bowl *tråg* (Sundqvist, 1990). The bark was left attached intentionally to keep the natural look of the tree. A soundboard made out from birch shingles was glued on the other side to cover the hollow interior. This created a chamber inside the log similar to many acoustic string instruments. Two sound holes were cut to the soundboard following a shape

inspired by the Finnish bowed lyre jouhikko (Nieminen, 2008). A structure-borne transducer element was glued on the interior side of the soundboard with silicone, before attaching the soundboard to the body of the log. In this way, the soundboard acts as a resonating surface for the transducer and the hollow interior of the log acts as a chamber that amplifies the sound signal of the transducer resonating on the soundboard. These loudspeakers were placed on the floor with the natural bark side facing the audience, with the transducer element completely hidden inside. This idea reflects upon Fari Bradley's concept of *post-speaker sound art*, which aims to hide the sound source and deconstruct the use of homogenous generic loudspeakers (Bradley, 2021).

The last wooden loudspeaker in the multichannel system was made out of a section of the wood where the trunk divided into two branches. This section was kept as a solid wood piece, but part of the interior was hollowed by drilling holes and carving with gauges, similarly as hollowing a greenwood shrink pot. The branches, which open up to two different directions, were drilled from the pith, connecting an airway to the hollowed area. One 4 inch loudspeaker element was inserted to the hollow area facing inside. This created a chamber where the sound was coming out from two smaller diameter holes, adding an echoey and distinct timbre. This loudspeaker was located at the entrance of the installation, the rearmost from the audience.



Image 9: Wooden bark loudspeakers. Photo by Jaakko Arola.
Three loudspeakers with a transducer attached to a soundboard and one branch section loudspeaker with a speaker element inserted inside (second to right).

Hanging metal plates

The last components of the multichannel loudspeaker system were two hanging metal plates. The plates were made from two large metal sheets found from a metal recycling container. Before the installation, the plates were cut to a leaf-like shape by Elisa, a shape recurring in the plates of the sound sculpture. The form was finalized by twisting the plates by hand, creating an uneven surface. Metal rings were added to the sides of one of the plates, making it act as a big resonating buzzer, inspired by timbre-modifiers used in many musical instruments from the African continent (Merriam, 1962; Driver, 2017). The other plate was kept without the metal rings. A transducer was attached to the back side of both of these plates and they were hung at the back of the installation, behind the performing area.



Image 10: Hanging metal plate loudspeakers. Photo by Jaakko Arola.

4.2.2 Sound sculpture

The idea for the sound sculpture developed through experimentation with creating feedback by structure-borne transducers and contact microphones attached to metal plates. Feedback refers to a phenomenon taking place when an amplified output feeds back into itself, most commonly through a microphone being in close proximity to the speaker. Although feedback can often get considered as unwanted or as a failure, many artists have been embracing it as a tool for artistic expression since the 20th Century, creating foundation for *feedback musicianship* that has flourished in ways such as the no-input mixing board of Toshimaru Nakamura or modern instruments like the Halldorophone (Magnusson, Kiefer & Ulfarsson, 2022).

The concept of the sound sculpture was introduced by me, the sculpture itself was built by Elisa Sakko and the sonic side was developed together with Otso Kauniskangas. Metal has good resonating qualities and distinctive sound, making it a strong candidate to be used as a sound source, both acoustically and as a resonating surface for a transducer. The process of building the sculpture included an iterative cycle process of sharing sketches and ideas between the artists involved. The three of us met together to explore how the feedback is created with transducers and contact microphones, and how the surface and different attachment methods could affect the resonance of the structure. During the iterative cycle process, multiple playing techniques were developed, both acoustic playing techniques as well as techniques incorporating electroacoustic means. These developed techniques are detailed in the following section.

All of the material for the sculpture was salvaged from a scrap metal recycling center. The frame of the sculpture is made from metal pipes that are partly welded together and partly connected with bolts. Two large metal plates are attached to the frame with bolts in two attachment points. A total of three structure-borne transducers and two contact microphones are attached to the sculpture. One contact microphone and one mid-range structure-borne transducer are attached on both of the plates, and an additional bass structure-borne transducer is attached to another of the plates. This electroacoustic implementation creates a possibility for using the sculpture either as one extra loudspeaker in the multichannel sound system of the installation, or as an instrument on its own. In the performance, the bass

transducer received a signal from a different amplifier than the mid-high range transducers, creating a possibility for using these three transducers independently or all together.



Image 11: Metal sculpture in the installation space. Photo by Elisa Sakko.

4.2.3 Techniques for playing the sculpture

The following playing techniques for the sound sculpture were investigated together by myself and collaborating partners Otso Kauniskangas and Elisa Sakko. The techniques can be used one at a time, or by combining two or different techniques. In the performance, the methods of touch and bowing were played by Elisa Sakko, and the signal was controlled by Otso Kauniskangas, who also played the sculpture by remotely controlling the feedback. The sculpture also amplified the bass clarinet and the voice, becoming part of the multichannel loudspeaker system.

Physically touching the sculpture

The metal plates resonate when touched, creating different pitches. All of the metal in the sculpture is connected together and therefore the whole structure resonates fully. One piece of metal pipe is left unattached, resulting in a rattling sound on the base of the sculpture. This unattached pipe can also be used as a sound evoking element on its own by hitting the frame of the sculpture with the piece. The acoustic sound of the sculpture can also be amplified through the contact microphones attached to the metal plates. Even a small touch on the side of the metal plate creates resonance, and the depth of that sound can be enhanced by routing the signal to the subwoofer.

Playing with a bow

The plate creates different pitches in different areas, depending on how close the area is to the point where it is attached to the structure. In the parts further away from the attachment point, the plate has more space to vibrate, resulting in a lower sound. The plate has less resonating and vibrating surface on the parts closer to the attachment point, which results in higher frequencies. By bowing the metal plates with a violin bow, the vibration can be sustained and enhanced.

Remotely controlling the feedback from an attached contact microphone and transducer

The feedback created by the three structure-borne transducers and two contact microphones attached to the sound sculpture open the possibility for using the sculpture as an independent sound source. Both of the plates in the sculpture include a contact microphone and a transducer, but the signal from the contact microphone is always sent to the transducer attached to the plate on the opposite side. The closer the microphone is to the transducer, the more sensitive it is for creating feedback. Having distance between these two elements allows for more space to control the level of feedback they create. The gain level of attached contact microphones is controlled remotely from the pre-amp, opening the possibility for playing the sound sculpture without physically touching it.

By using the bass transducer as a main sound source, lower sounds were more present. When the bass transducer wasn't amplifying the sound signal, more high frequency sounds were achieved. All three transducers could also be used at the same time, resulting in a wide range of sonic possibilities ranging from low frequencies to extremely high.

By touching with a contact microphone held in the hand

The feedback is created similarly as mentioned above, but instead of a fixed contact microphone on the plate, a performer holds a contact microphone on their hand. By changing the location of the microphone, the response rate changes. This method is far more unpredictable than controlling an attached microphone, and requires more precision, constant attention and reactive interaction by the holder of the microphone and the person controlling the signal. A person touching the sculpture adds a different layer into the performance, making the sculpture act more as an electroacoustic instrument, rather than a loudspeaker or remotely controlled sound object.



Image 12: Jaakko Arola and Elisa Sakko performing. Photo by Alisa Khodos.
Elisa Sakko playing the sculpture with a violin bow.

4.2.4 Signal route

The non-conventional multichannel loudspeaker system configured by three bowl loudspeakers, four wooden bark loudspeakers, two metallic plates and the sculpture was used as the main sound system for the installation. Besides these loudspeakers, the PA of the venue was used to support the sound of the bass clarinet and voice, and one extra floor level subwoofer was added to support the lowest frequencies coming from the sculpture and the pad contact microphones of the modified bass clarinet. None of the loudspeakers were identical, all being made out of different material, being different size or having a different type of transducer or loudspeaker element. Certain loudspeakers were louder than others, and their levels were adjusted, but otherwise the unique timbral qualities were kept as a part of the loudspeaker system, drawing influence from the configuration of a loudspeaker orchestra (OlarTE, 2019).

The loudspeakers were connected to two multichannel Audac 616 amplifiers, one located on floor level and one on ceiling level. The signals from the bass clarinet, made from a total of three 4099 DPA condenser microphones, two K&K Big Shot's on the body of the clarinet, one K&K Big Twin dual pickup on the pads of the clarinet and one Ehrlund EAP on the throat, were routed to the main mixer of the performance space. These audio signals were sent via Dante to Otso Kauniskangas on the stage, using a Dante interface. The processed and spatialized signal from Otso was sent back to the main mixer, where it was routed to the amplifiers and the multichannel loudspeaker system. The feedback of the sound sculpture was controlled on the stage through an analogue mixer to avoid latency.

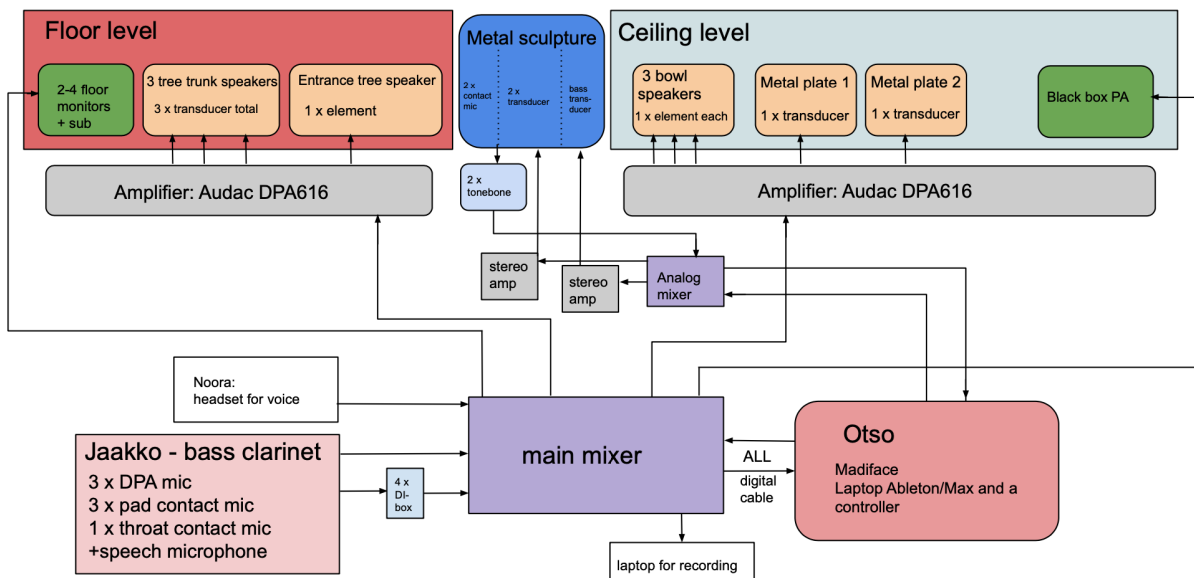
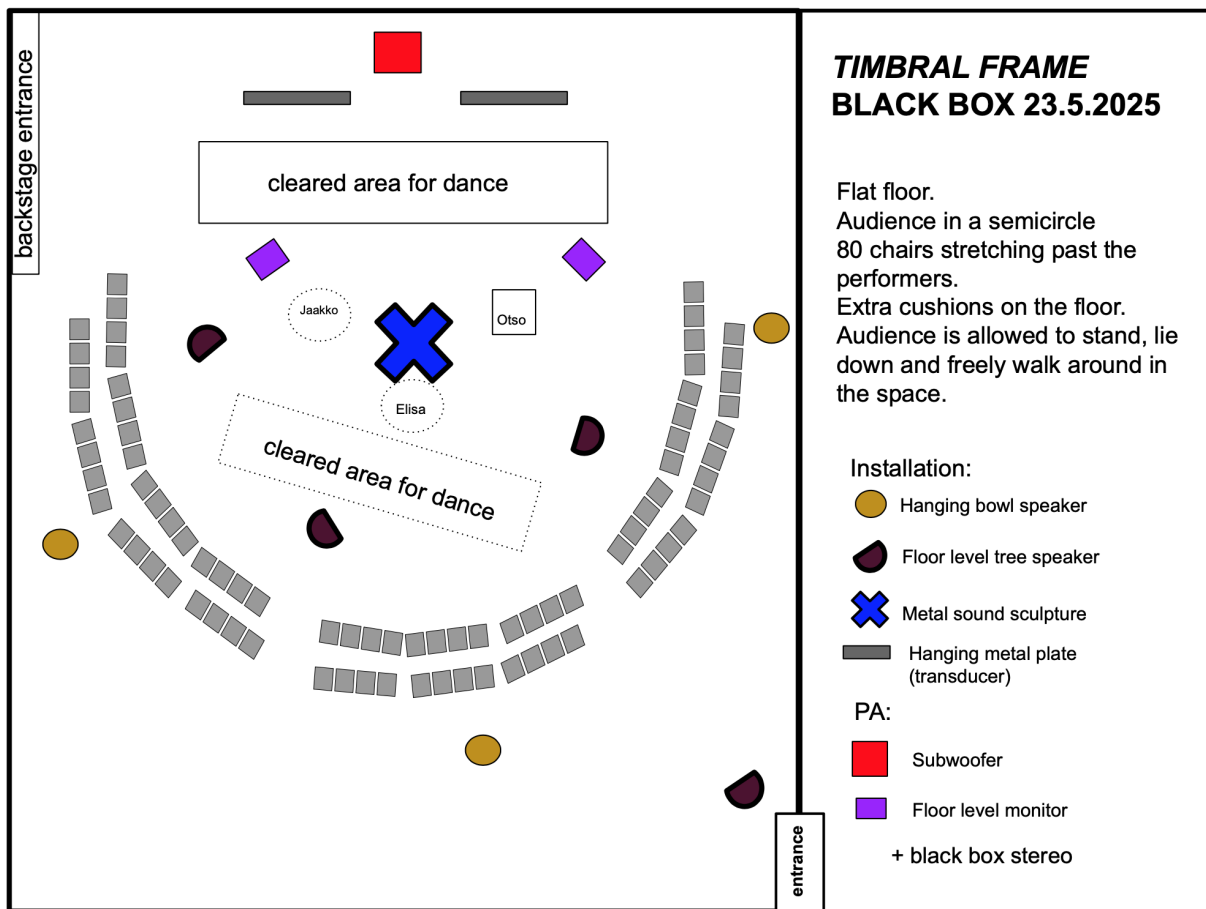


Figure 2: Installation layout and the signal route.

4.3 Part three: collaborative process and the structure of the installation-performance

Installation-performance *timbral frame* took place on 23rd of May 2025 in the Musiikkitalo Black Box, Helsinki. More information about the project, including audio and video experts of the performance, can be accessed from the web page: www.jaakkoarola.com/timbralframe

Descriptive text on the programme notes:

Timbral frame, a wordplay between the traditional craft of timber framing and the timbre of music, is an installation-performance which explores the borders and intertwines between modified instruments and sound sculptures. The space includes a wooden loudspeaker set-up handcrafted by musician-woodworker Jaakko Arola, and a sonic sculpture created in collaboration with visual artist Elisa Sakko. In the core of the performance is Arola's bass clarinet and its modified timbre, and the loudspeaker setup controlled by sound artist Otso Kauniskangas. The performance includes collaborative improvisations by the whole working group, Noora Arola's dance score and a set of solo bass clarinet compositions that are enhanced with live electronics.

Artistic working group and installation design:

Performers:

Jaakko Arola - modified bass clarinet, voice

Otso Kauniskangas - live electronics

Elisa Sakko - sculpture

Noora Arola - voice and movement

Installation:

Wooden loudspeakers: Jaakko Arola

Metal plates: Jaakko Arola & Elisa Sakko

Metal sculpture: Elisa Sakko



Image 13: The installation space. Photo by Alisa Khodos.

4.3.1 *Timbral frame* working process

The process of creating the installation-performance *timbral frame* was constructed from three working periods. The first period created the foundation for the process and the second period emphasized experimentation and collaborative creativity. Finally, the third period constructed the final piece following the foundation and experimentation created in the first two working periods. These periods will be described more in detail below.

First period: Foundation (*January-February 2025*)

1. *Experimenting with the modified bass clarinet:* This process acted as a continuation for the artistic practice of modifying the bass clarinet, as explained in chapter 4.1. Experiments with the alternative mouthpieces, contact microphones and extended techniques were carried out to find ways of incorporating these modifications to my artistic practice and forms of sonic expression.

2. *Inviting the group of artists to join the project:* The initial idea was to implement a collaboration with a group of people that I personally knew and spent time with outside of artistic work. Factors such as shared identity, friendship and past collaborations were taken into consideration when forming the group. All of the members work with multidisciplinary methods in their personal artistic practice and are constantly eager to collaborate with other disciplines. This pushed the collaboration towards interdisciplinarity and gave shape for what could be possible.

3. *Developing the sonic possibilities of the sound sculpture with Otso Kauniskangas:* Experiments with controllable feedback, created with structure-borne transducers and contact microphones attached to metal plates, acted as the foundational idea for the sound sculpture.

4. *Creating the concept and drafting design for the installation:* With the confirmation of the full working group and knowledge of their artistic interests, the concept of the project started to take form. The preliminary design for the installation included a metal sculpture in the middle of the space and a multichannel loudspeaker system spatially distributed to occupy the whole space.

Second period: Experimentation (*March-April 2025*)

5. Developing the sound sculpture further with Otso Kauniskangas and Elisa Sakko:

The working roles for creating the sound sculpture were divided to include Elisa Sakko designing and building the physical metal sculpture, and myself and Otso Kauniskangas developing the feedback loop created by structure borne-transducers and contact microphones. During the process different materials were explored as resonating surfaces, and multiple playing techniques for the sculpture were developed.

6. Building the multichannel loudspeaker system: The multichannel loudspeaker system consisting of three hanging bowl loudspeakers, three wooden bark loudspeakers, one branch section loudspeaker, two hanging metal plate loudspeakers and a metal sound sculpture was built as explained in the chapter 4.2.

7. Creating music for modified bass clarinet and spatial audio: Drawing influences from the experiments with the instrument modifications and the sound sculpture feedback, I created a set of solo bass clarinet compositions that took into consideration the space and the multichannel loudspeaker system. The compositions were further enhanced with live electronics by Otso Kauniskangas. By turning on and off certain contact microphones in specific sections, the composed material explored the possibilities of spatializing the sound into different parts of the room.

8. Drafting a preliminary structure, creating the signal route and finalizing the installation design: Through an iterative cycle process, a preliminary structure for the performance was created based on resonating moments that had emerged during the collaborative processes and experimentation. The structure of the performance was divided into six sections. As we were not able to meet all together yet at this point, communicating and sharing thoughts and videos of processes online became an important factor for taking the process further. A signal route diagram and an installation layout were created to illustrate how all the elements configuring the installation-performance were connected to each other (see figure 2, page 58). Apart from being my way to clarify the setup and the technical needs, it helped to communicate the idea and plan to the collaborating group and to the technical team working at the venue.

Third period: Construction (May 2025)

9. Rehearsals with the multichannel loudspeaker system, the sound sculpture and movement: A smaller scale version of the installation was built with all of the loudspeakers located according to the installation layout. Pre-composed material with spatialization, and interaction between movement and sound was experimented and rehearsed with Otso Kauniskangas and Noora Arola. The sound sculpture was finalized by attaching the structure-borne transducers and contact microphones to the metal plates, and different playing techniques were further developed together with Otso Kauniskangas and Elisa Sakko.

10. Intensive weekend rehearsal 17-18.5 with the whole group: Rehearsal with the whole group and a smaller scale version of the installation. The structure of the performance was developed further and ideas were shared between disciplines. During this process leading towards the installation-performance and later in the presentation of it, certain key topics were investigated:

- a.) *Timbre:* How can the timbre of a sound source be altered and modified? Finding ways to support and complement each other's sonic and artistic expression.
- b.) *Intertwines between acoustic instruments, live electronics, human voice and sound sculpture:* Merging sounds together and losing the origin of each individual sound source. Investigating what are the borders of these definitions. When does a sculpture become an instrument?
- c.) *Interdisciplinary and connective collaboration:* Translating ideas from one discipline to another. Finding ways of drawing inspiration from other disciplines. Investigating how our shared identities and past experiences affect the collaboration and performance outcome.

11. Setting up the installation and rehearsing all of the six sections in the installation space: The installation was built on Thursday 22nd of May, one day before the performance. On the morning of the performance, all of the sections were marked and discussed in the installation space with the whole artistic group and technical team present. A finalized version of the structure was discussed and agreed.



Image 14: Jaakko Arola performing. Photo by Alisa Khodos



Image 15: Noora Arola performing. Photo by Alisa Khodos.

4.3.2 Structure of the performance

The performance was divided into six sections, all sections interconnecting to each other, creating a piece total of one hour. The structure of the piece and the division between the elements is presented in the table below. All six sections are further opened up in this section.

	Section 1	Section 2	Section 3	Section 4	Section 5	Section 6
Working title	Intro	Arpeggiator	Force Majeure	Collective impro	Pitkä drone	Laskeva linja
Concept	Semi-acoustic improvisation	Presenting the multichannel loudspeaker system. Communication	Enhanced solo composition + multiphonics and sculpture duo in the middle	Merging sounds and timbral similarities. Communication and creating a mass of sound	Long lasting, gradually increasing drone. Endurance	Enhanced solo composition + full group improvisation
Duration	5 min	5 min	13 min	10 min	10 min	12 min
Jaakko	Shakuhachi modification	Bass clarinet pedal point and percussive pads	Contact microphones and polyphony. Extended techniques in the middle.	Overtone modification for the first half. Extended techniques for the second.	Bass clarinet drone. Pulse and vocal shouts in the end	Contact microphones and polyphony
Otso	Controlling the signal of the sculpture Playing the sculpture remotely.	Playing the multichannel loudspeaker system by spatializing the signal of the bass clarinet	Controlling the microphones, spatializing, live electronics and playing the sculpture	Controlling the sculpture	Spatializing the drone Playing the sculpture	Controlling the microphones, spatializing, live electronics and playing the sculpture
Elisa	Touch and bow	Off the stage	Off the stage	Hand held contact mic Playing with the rattling metal piece	Sitting behind the sculpture	Hand held contact microphone
Noora	Off the stage	Movement score	Off the stage. Joins at the end with voice	Voice	Rapid movement in the end. Ending with a slow movement improvisation in total silence	Voice and movement
Tree speakers	OFF	Part of the multichannel loudspeaker system	Clean sound + part of the multichannel loudspeaker system	Clean sound	Part of the multichannel loudspeaker system	Part of the multichannel loudspeaker system
Metal plates	OFF	Part of the multichannel loudspeaker system Buzz	Part of the multichannel loudspeaker system	Buzz	Buzz	Part of the multichannel loudspeaker system Buzz
Sculpture	Low pitched resonance sound from touch and bow. Remotely controlled feedback towards the end.	Part of the multichannel loudspeaker system	Part of the multichannel loudspeaker system High pitched feedback in the middle section	High pitched feedback Low roaring sounds with tactile bass shaker	Part of the multichannel loudspeaker system Feedback in the end	High pitched feedback Part of the multichannel loudspeaker system
PA	Bass clarinet direct sound + added sub	Bass clarinet direct sound + added sub	Bass clarinet direct sound + added sub	Bass clarinet and voice direct sound	Bass clarinet direct sound + added sub	Bass clarinet and voice direct sound + added sub

Figure 3: the structure and division of the elements in *timbral frame*

1st section (Jaakko Arola, Otso Kauniskangas, Elisa Sakko)

An improvisation for bass clarinet with shakuhachi mouthpiece. Long and calm melodic lines that lasts for a duration of one breath, evoking aesthetics from Honkyoku music. The direct sound of the modified clarinet coming out only from the PA. After a few minutes of clarinet solo, Elisa joins the improvisation by gently tapping the sound sculpture and later by playing with the violin bow. The low sound of the sculpture is routed to the subwoofer. Towards the end of the section, Otso adds feedback with high frequencies by controlling the sculpture remotely.

2nd section (Jaakko Arola, Otso Kauniskangas, Noora Arola)

Semi-composed bass clarinet piece with added live electronics and movement score. The sonic material includes a static pedal point with key clicks and a vocal melody. By pressing down the keys of the clarinet in a way that doesn't affect the fundamental note of the pedal point, a sense of "timbral arpeggiator" is achieved. Noora uses this idea as a starting point for creating a score that aims to translate the sonic material into movement. Otso spatializes the signal from the bass clarinet to the multichannel system, thus introducing the whole multichannel loudspeaker system and its timbral differences. All three performers have their own roles that are constantly influenced by each other, yet could also exist on their own.

3rd section (Jaakko Arola, Otso Kauniskangas)

Composition for solo modified bass clarinet written in the beginning of 2025 titled Force Majeure (see notation in Appendix 3). During the collaborative process, the composition was re-arranged and enhanced for live electronics and spatialized audio. The first part of the section includes changing elements, effects and wide spatialization, contrasted with a clean bass clarinet sound in the interlude. The interlude section also includes a duo improvisation for bass clarinet multiphonics and remotely controlled sound sculpture, investigating the similar timbral qualities of the sound sources. The piece ends with a slow repetitive bass clarinet pattern. Noora joins this pattern with a vocal improvisation that connects to the next section.

4th section (Jaakko Arola, Otso Kauniskangas, Noora Arola, Elisa Sakko)

Noora's vocal improvisation overlapping to the fourth section is joined with Otso playing the sculpture remotely with high frequency feedback. Bass clarinet with overtone flute modification and Elisa playing the sculpture by touching it with a contact microphone joins the improvisation. This section is treated as an open improvisation to give space for communication and artistic expression between the working group. Towards the end, the concept of merging sounds and timbral similarities are investigated by creating a mass of sound with bass clarinet multiphonics, human voice and low roaring sounds from the sculpture. The

conclusion of the section is to be marked by a crescendo, a phenomenon that has been agreed upon in advance.

5th section (Jaakko Arola, Otso Kauniskangas, Noora Arola)

Section utilizing endurance and slow changes. Through circular breathing, a long bass clarinet drone note is held for the whole duration of this section. Small elements are added throughout the section, including vocal shouts and repetitive pulse enhanced with contact microphones on the pads. The drone is spatialized throughout the space, with little added effects. The section grows dynamically and is joined by Noora's high intensity movement. All sonic material stops at the same time after the ten minute build up, leaving Noora on the stage with slow movement score in total silence.

6th section (Jaakko Arola, Otso Kauniskangas, Noora Arola, Elisa Sakko)

Solo composition for modified bass clarinet with added full group improvisation in the beginning. Noora's slow movement in total silence overlaps to the beginning of the final section. Elisa and Otso join by playing the sculpture. Noora joins the pre-composed material with voice and movement. The composition and spatialization gradually fades out, leaving the sound sculpture to be the last active sound source present in the space.



Image 16: Artists after the performance. Photo by Roman Odjinud.



Image 17: Artists after the performance. Photo by Roman Odjinud.

CHAPTER V: Reflections

5.1 Audience engagement

Although the piece has traces to musical performance practices, instead of filing under a traditional musical concert format it sits in the lineage of installation art, electroacoustic music concerts and interdisciplinary practices. The space itself and the objects acted as equally important part of the performance as the human performers. The audience was given the opportunity to arrive before the beginning of the performance to observe and experience the space as an independent installation. The seating for the audience was arranged in a semi-circle formation with the multichannel loudspeaker system distributed throughout the room (see figure 2, page 58). During the performance the audience was also allowed and encouraged to move around in the space and observe the whole unity from different perspectives. After the performance, the audience was still given the chance to remain in the space to observe the installation from different angles.

Based on anonymous feedback from the members of the audience, they felt a strong urge to experience and witness the space and the objects from closer and from different angles. However, in the beginning of the performance, the static seats, low volume of the sonic material and the dim light in the space didn't encourage the audience to get up from their seats and walk around (Anonymous audience feedback, 2025). I also observed this during the performance and when analyzing the recording afterwards. About 15 minutes after the performance started, the audience started to move around in the space for the first time. Nevertheless, in comparison to the total number of audience in the room, the number of people actually changing their location during the performance was minimal.

Allowing people to stay in the installation space after the performance finished was seen as a relieving experience, as it allowed the members of the audience who chose not to change locations during the performance to observe the objects closer, and to get a hands-on feeling of the material by touching the objects (Anonymous audience feedback, 2025). However, the installation was not creating sound anymore after the performance ended, and the space was filled with the sound of people chattering and socializing with each other. In this format it was not possible to witness the installation anymore in its original state that combined visual

and sonic material. This changed the nature of the installation, and transformed it from an installation art piece into a communal space where people were allowed to observe the space, but also socialize, wander around or exist in whichever way they felt comfortable. I experienced this change as a positive transition, and it further evoked conversations around the installation-performance.



Image 18: Members of the audience observing the installation after the performance. Photo by Alisa Khodos.

5.2 Reflections from the process

This part will discuss the interdisciplinary collaboration and collaborative creativity in the process of creating the piece. All members of the collaborative group answered a survey after the performance to elaborate on their experiences on the collaborative process and connectivity. The comments regarding the process are processed anonymously and are translated from Finnish to English with Google Translator. I'm acting both as a participant and as a researcher in this context. I acknowledge how my position may affect my own perspective and the answers of other participants.

The group was asked to elaborate on the following questions:

1. *How would you describe the dynamics and the atmosphere within the working group? Why did it feel that way?*
2. *Was it easy to collaborate with each other? Did you feel comfortable expressing yourself artistically in a way that feels natural to you? What factors did or did not make it possible?*
3. *Did any challenges come up during the process? Was the division of tasks clear and fair?*
4. *All of the members of this working group work with diverse approaches and do not specify their work under one category. How would you describe your own work? How does it feel to collaborate with other people who work with a multidisciplinary approach?*

By summarizing the reflections from each participant, everyone agreed that the dynamics in the group felt good and clear. The word trust was mentioned multiple times in the survey answers, both as trust to other collaborating partners, as well as trust towards the process and the final product to become ready and something to stand behind. One collaborator experienced that “the members of the working group worked with mutual respect and with the intention of supporting each other’s strengths and creativity” (Anonymous survey responses, 2025).

The main difficulty, as everyone agreed, was the limitations in common rehearsal times, which affected the process. However, based on the answers, this did not cause additional

stress or discomfort, but rather pity for missing out on certain collaborative aspects that could have strengthened the collective and individual experiences. Some of these aspects included not having enough time to improvise and play around with the themes without the need of creating something ready or presentable, or to explore other possibilities on how our different disciplines could have worked together and enhanced each other over a longer time frame.

Although the limitations were acknowledged and the process was constantly developed based on participants' human needs and possibilities, longer rehearsal periods could have helped in forming a stronger bond. One participant mentioned that compared to working alone, in collaborative situations it can be harder to express themselves artistically. Although everyone's individual expression was valued and that was specifically encouraged, a longer time period of working together and getting familiar with the group could have helped in liberating the mind from pre-imagined rules of collaboration. As mentioned by one collaborator “although the work mostly felt easy and fruitful, I think that delving into this way of creating and thoroughly exploring it could make it even safer to really try new things and go in directions that could create a new kind of language and dialogue between sound, movement and materials, and enable the emergence of a new kind of grammar” (Anonymous survey responses, 2025).

Based on the answers, the fact that all of the participants worked in multidisciplinary methods did create certain confusion in the division of the roles in the beginning, as collaborators' workfields would sometimes overlap. However, this was not seen as a negative thing in itself, but the limitation in time did not allow for those overlaps to resolve naturally into clear divisions. One collaborator explained that it took a moment to find their place in the project, “but this didn't bother me, there was just so much to explore in the whole thing that it was a shame that there was so little time to explore between the whole group” (Anonymous survey responses, 2025). Simultaneously, certain working methods would not be familiar to another artist, but experiencing different disciplines collaborating was fruitful and inspirational. One collaborator mentioned that “it was also very interesting during the process to see and witness the work and efforts of other team members that exceeded my own abilities or understanding” (Anonymous survey responses, 2025).

When reflecting on multidisciplinary expression methods, some terms that the members of the group used to describe their work included *multimaterialistic* and *multisensory*. Their

creative process involved approaching artistic creativity through questions, asking how elements from one discipline could be translated into another, for example, by exploring how to translate shape, sound or material into movement. One collaborator mentioned that in their artistic process they are trying to take into consideration all factors that affect the overall experience, and trying to make decisions on where to focus based on those factors.

I recall experiencing stress and frustration from my own process as well as seeing other participants being frustrated in their practice, but this frustration was never aimed at other people. It was rather shared and acknowledged, and space was given for that feeling to exist during the process. Even when certain plateaus were hit and the timeline felt pressuring, trust towards the final product was always present.

By reflecting previous experiences as a participant in collaborative projects with a clear leader, in projects with no clear division of tasks, and in projects that I've facilitated, I can see the need for someone to be in charge of organizing the process. However, clear and open communication about the methods for collaboration is needed, so that the view on that person doesn't shift from seeing them as a facilitator into seeing them as a strict leader, which could diminish the act of daring to take artistic risks.



Image 19: Jaakko Arola, Elisa Sakko and Noora Arola performing. Photo by Roman Odjinud.

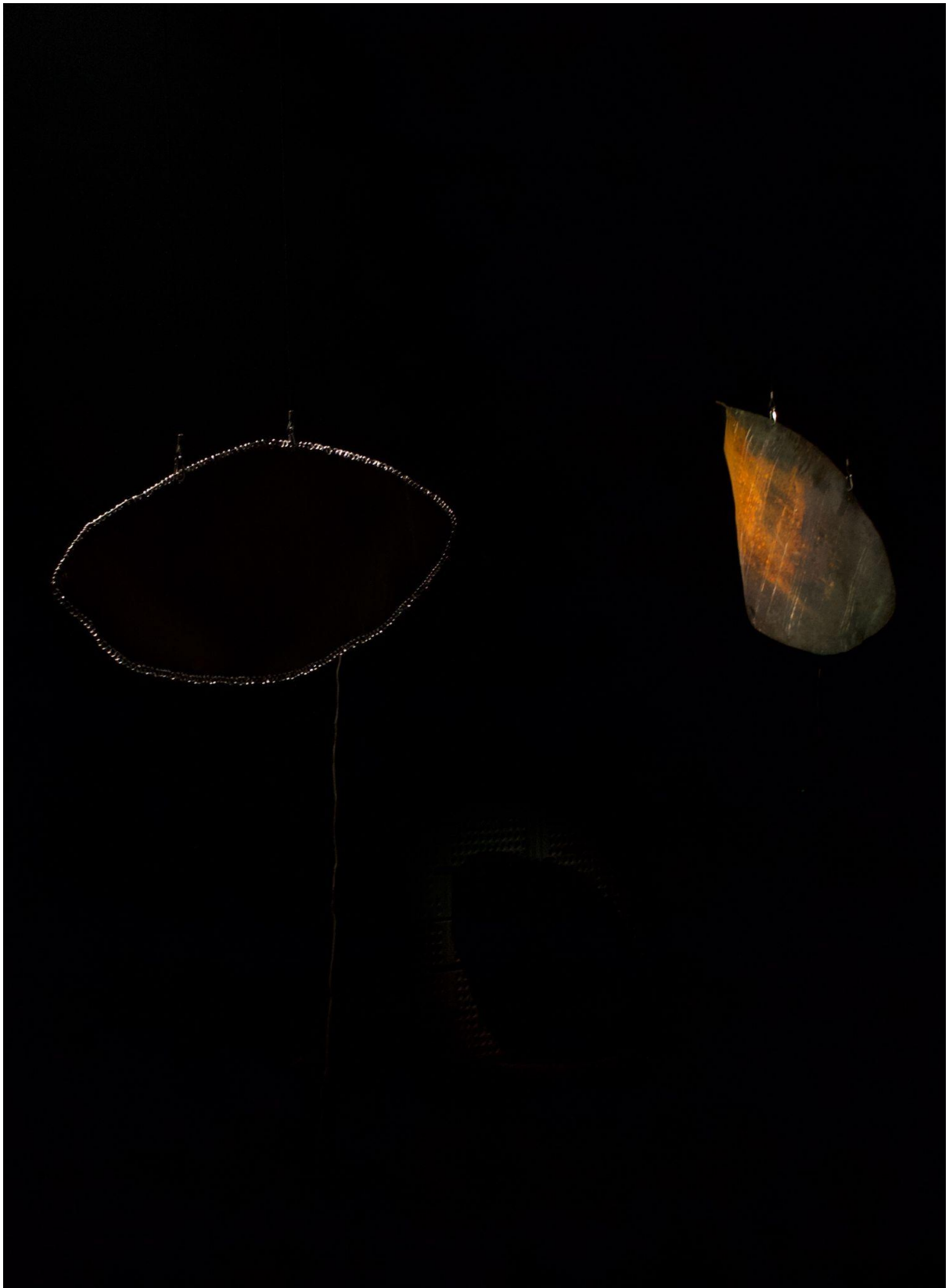


Image 20: Hanging metal plates in the installation. Photo by Elisa Sakko

CHAPTER VI: Outro

6.1 Research findings

In this section, I present the main findings of this research, drawing data from my ethnographic practice-based research with instrument modification and implementation of handcrafts with sonic based practices, as well as from the interdisciplinary process of creating an installation-performance through collaborative creativity. The data created through these artistic processes was reviewed and analyzed with the intention of finding ways how they have affected my personal artistic vision, forms of sonic expression and the formation of my artistic identity. The interdisciplinary collaboration is analyzed from direct feedback and experiences shared by the whole working group, as well as by reflecting on the final outcome from personal observations, as well as from feedback from audience members.

This artistic research started with the research question *“How can instrument modification and the implementation of handcraft methods give rise to new forms of sonic expression and strengthen one’s artistic vision?”* and later on expanded to include data from the collaborative process with the research question *“How can artistic work taking a starting point from individuals’ meaningful expression methods and collaborative creativity affect ones’ artistic identity and the artistic outcome?”*.

The artistic outcomes of this study include new compositions, bass clarinet modifications, new techniques, non-conventional loudspeaker system, interdisciplinary collaboration, and an installation-performance. All of these products act as central themes to investigate the research question and they serve equally as data of the research, as well as the results. Through reflecting the knowledge gained through this artistic research, I have divided the main findings of this study under three key observations. The first observation addresses my artistic identity in relation to the practice of instrument modification. The second observation highlights how implementation of meaningful methods of artistic works affects the identity and collaborative process. Finally, the third observation discusses how collaborative creativity can affect the artistic outcome. Although the observations are presented as generalized statements, eventually they are only describing my personal insights.

I further acknowledge the limitations of this study, including limitations in the timeframe and my position as both a participant and a researcher, and the fact that I can answer the research questions only from my point of view. Other artists working with these same fields have different observations and understandings of these factors. Certain experiences from other collaborating artists are used as supporting data for the research, but ultimately the findings of this study are presented from my perspective.

First key observation

The act of modifying established musical instruments comes from the artist's personal need to be able to correlate with sonic aesthetics and preferences, and it works in a reciprocal relationship in shaping their identity and giving inspiration for new forms of sonic expression.

Main finding from my research within instrument modification in the past years shows that the act of modifying the sound of an instrument is strongly connected to an artist's own identity. The identity and the artistic practice exists in a reciprocal relationship where both elements influence each other. The discussed methods of modifying my bass clarinet, as explained in the first part of the case study in chapter 4.1, shows that the modification methods have taken a starting point from my past influences and from the need to bring together my multiple areas of interest. At the same time these modifications have influenced my work further, with outcomes such as new compositions, new collaborations, multidisciplinary approaches, and new sonic explorations.

The process of modifying the timbre of the bass clarinet has been explored with methods such as physical manipulation of the instrument, including adding new parts to the instrument, non-conventional microphone placements and extended techniques. The inspiration for these modifications comes from the need to make the instruments timbre correlate with my changing sonic identity, which has been shaped by my own cultural background, as well as the immersion into other cultures, and musical traditions from many parts of the world. The new sonic qualities of the modified bass clarinet has been explored with methods such as improvisation and experimental practice.

All of these methods and outcomes have shaped my artistic identity and the way that I express myself sonically. Yet, I can acknowledge my identity to be constantly changing and being influenced by factors such as people, environment and sounds. The changing timbre of the modified bass clarinet gives reciprocal inspiration for new forms of expression and new compositional ideas. This was concretized when some of these newly discovered sonic qualities gave inspiration, and were further incorporated in the compositions and improvisations performed in the installation-performance *timbral frame*.

In the light of earlier mentioned literature, artistic identity is made out of multiple factors and can be constantly changing. In my personal work, through the explorations with the bass clarinet modifications I can reflect and locate certain phenomena, including past experiences, cultural immersion and human interactions, that have influenced my work and taken part in shaping my artistic identity. Although the core outcome of this study, the installation-performance *timbral frame* is viewed as an immersive, interdisciplinary unity, and not a showcase for the bass clarinet, I have referred back to my personal work with the modified instrument, as it offers tangible results to the first research question investigating the effect of practice of instrument modification on my personal artistic identity.

Second key observation

The implementation of individuals' most meaningful forms of expression strengthens artistic vision, affects the formation of artistic identity and nourishes the feeling of psychological safety-net in collaborative processes.

By allowing myself to work with methods that I feel most connected to, and avoiding methods that I feel that I should use based on my education or skills, has liberated my artistic expression and strengthened my personal work. Allowing similar personal processes to happen within a collaborative group has created a safer and non-judgemental space for creating new art and taking artistic risks.

Analysis of past projects, studies and current work opens up my process for creating new artwork that lies somewhere between the lines of sound art, music, handcraft, and visual art. The formation of artistic practice combining sonic elements and handcrafted objects helps to understand how these elements and different approaches can co-exist in artistic practice and give reciprocal benefit for the process. Brief introduction to some of my past projects

featuring diverse disciplines helps to understand the formation of my multidisciplinary artistic identity, and the need to collaborate with connective and interdisciplinary methods.

Third key observation

Collaboration taking a starting point from reinforcing human connection creates a safe space that allows room for sharing ideas and taking artistic risks. All these add to the formation of a confident artistic vision and artistic outcomes that traces shared ownership between the creators.

Throughout this study, collaborative creativity is used as a term describing how an interdisciplinary collaboration can thrive by reinforcing the human connection between the collaborators. Although the project connected to this study took place only between four professional artists, non-judgemental and connective approaches from the fields of socially engaged art, community engagement, and collaborative creativity were implemented to the process. By collaborating with an interdisciplinary group consisting of multidisciplinary artists, I've learned about different perspectives on collaboration, and how willingness to share knowledge and work across disciplines results in new ways of artistic expression. As a facilitator of a project that took a starting point from human interaction and shared identity, I have witnessed the importance of the feeling of a safe working environment and its effect on the artistic outcome.

6.2 Final conclusion and possible directions for future research and artistic work

This research has given me insight into my own practice as a multidisciplinary artist, and into ways of creating artistic work through collaborative creativity. I have reflected on the process both through the lens of a facilitator of the collaboration, and as a collaborator with shared responsibility. Hands-on practice with handcrafts and instrument modification has enhanced my artistic identity and created meaningful ways of working with multiple expertise in a single project. As presented in the previous section, through this written thesis I discovered three personal key observations related to the study and the process.

Future directions of work that I'm interested to explore includes, for example, continuing developing an installation-performance practice that fosters more elements from socially

engaged practices and immersive arts. This could mean, for example, creating performance scenarios where the audience can affect the sonic and visual material of the installation. In future works I hope to be able to break down the performer-audience divisions in installation pieces, creating spaces where the audience can feel more encouraged to experience the art piece from multiple angles. Moreover, I would like to take into consideration and emphasize the visitors' bodily feeling in the installation.

I see potential to continue the research and explorations with modified instruments, extending my personal processes, for example, to modify the bass clarinet to become an active acoustic augmented instrument, or to collaborate with other instrumentalists. From my perspective, instrument modification offers a concrete method for expanding and observing the formation of artistic identity. Moreover, I see potential for instrument modification to act as a starting point for community engagement projects and as a powerful tool for music therapy. Additionally, as a continuation for this study, future areas of research for myself, or for other artistic researchers in the field, include a deeper, longer term research into how collaborative creativity can affect the creative process and artistic outcome.

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Appendices

Appendix 1: Consent form

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Template of the consent for use of personal data. All signed consent forms have been archived and are in the possession of the researcher.

Consent for use of personal data
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Helsinki
31.05.2025



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Consent for use of personal data

Consent to participate in the research: timbral frame: Expanding artistic identity through the process of creating an installation-performance

I have understood that participation is voluntary, and at any point in the research I am at liberty to notify the researcher that I no longer wish to participate in the study.

- ☐ I want to participate in the artistic research as an expert/artist/composer, and I want the information to be published including my name.
- ☐ I want to participate in the artistic research project anonymously.
- ☐ I give permission related to the law of copyright to use my piece of art/performance as a part of the research.
- ☐ I give permission related to the law of copyright to show my piece of art/performance publicly.
- ☐ I want to be identified as the author of my piece of art/performance
- ☐ I want my piece of art/performance to be published unnamed.

I have received sufficient information about the research project. I have understood the information and I wish to participate in the research study.

Signature of research participant

Print name

Email address

Researcher's Contact details:
Jaakko Arola
jaakko.j.arola@gmail.com
+358 442041941
Sibelius Academy, University of the Arts Helsinki

Jaakko Arola - Otso Kauniskangas - Elisa Sakko - Noora Arola

timbral frame

installation-performance



Black Box, Musiikkitalo
23.5.2025 19:00

**UNIARTS
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Appendix 2: Programme notes

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Timbral frame, a wordplay between the traditional craft of timber framing and the timbre of music, is an installation-performance which explores the borders and intertwines between modified instruments and sound sculptures. The space includes a wooden speaker set-up handcrafted by musician-woodworker Jaakko Arola and a sonic sculpture created in collaboration with visual artist Elisa Sakko. In the core of the performance is Arola's bass clarinet and its modified timbre, and the speaker setup controlled by sound artist Otso Kauniskangas. The performance includes collaborative improvisations by the whole working group, Noora Arola's dance score and a set of solo bass clarinet compositions that are enhanced with live electronics.

Performers:

Jaakko Arola - modified bass clarinet, voice

Otso Kauniskangas - live electronics

Elisa Sakko - sculpture

Noora Arola - voice and movement

Installation:

Wooden speakers: Jaakko Arola

Metal plates: Jaakko Arola & Elisa Sakko

Metal sculpture: Elisa Sakko

Concept: Jaakko Arola

Sound: Mikko Ingman

Lights: Sirje Ruotula

Producer: Anna Huuskonen-Kuhlefelt

This event is Jaakko Arola's Masters performance at the Sibelius-Academy's Global Music Department.

Jaakko Arola

Jaakko Arola is a musician, composer, improviser, instrument maker and a green woodworker. Arola plays a large variety of woodwinds, focusing especially on low woodwinds. Trained also as a traditional woodworker, Arola expands his sound-based craft to include installation work and instrument modification.

www.jaakkoarola.com

Otso Kauniskangas

Otso Kauniskangas is a sound artist currently studying music technology at the Sibelius Academy. His current interests include audiovisual design and trashy rock music.

www.otsokauniskangas.xyz

Elisa Sakko

Elisa Sakko is a visual artist currently based in Helsinki and Kemiönsaari. Sakko's practice is focused on disassembling their old art works, and undoing and rebuilding other found materials. Their work explores communication, experiences of connection and separation, and movement between different materialities. Sakko works mainly with sculpture and multi-sensory installations that can be experienced through touch, sound, smell and sight, enabling visitors to engage with the material in their own way.

www.elisasakko.com

Noora Arola

Noora Arola is a dancer, musician and performer who is inspired by the communication and collision of different art forms as a way to access new information of the potentials of life. In her work, Arola is currently interested in questions as a starting point for improvisation-based creation.

Appendix 2: Programme notes

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You are allowed to move around in the space during the performance and listen to the sound from different locations.

Appendix 3: Notation of a composition

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Force majeure

For solo bass clarinet, voice and contact microphones

Jaakko Arola

Intro

♩ = 160

Right hand accenting 3, left in 2

A

3

6

8

11

Appendix 3: Notation of a composition

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2

Bridge A

13

15

Bridge B

19

B

23

27

30

Alternate the grouping of eight notes
Accent the first beat
2+3, 2+3, 3+3
3+2, 2+3, 2+4 and so on

Appendix 3: Notation of a composition

Page 3/4

3

Interlude

Free tempo multiphonics transition to C



C



D



Appendix 3: Notation of a composition

Page 4/4

4

A revisited BACK TO ORIGINAL TEMPO!

47

Bass pattern with overtone variations

50

52

55

OUTRO

57

Bass pattern with overtone variations

Transition to the next tune

59

60