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Performing Around Music

Studio, Instrument, Formats, Musician, Acoustics

Leo Helmut Hofmann

An accompanying thesis to the Portfolio
submitted for the degree of Doctor of Philosophy

City St George's, University of London
Department of Music

Submitted April 2026

Abstract

Performing Around Music is a portfolio-based PhD thesis within the academic framework of music composition, addressing researchers and colleagues of contemporary music and experimental music theatre. In relation to the seven works of my portfolio spanning 2018 to 2023, I investigate the act of playing music as a means of composition. Through the lens of my artistic practice, and referring to the works of colleagues, I explore performativity in relation to sound and music. The writing oscillates between phenomenological abstraction and an embodied perspective, investigating the act of playing music within the broad field between sonic phenomena and human activity. Five terms from the world of music serve as fixed points for capturing this spectrum. Encircling the notions of *studio, instrument, format, musician*, and *acoustics*, the thesis approaches the act of playing music in the logics of site, production and sensoriality, in doing so revealing different agencies, as well as format-specific dramaturgies. This thesis suggests to encounter music playing as an *autopoiesis*, in which the functional aspects of performativity and the presence of sound mutually legitimise, address and (re-)produce each other. In conjunction with the portfolio, a compositional practice is thus presented that expands upon and delineates the multitude of understandings of what it means to perform around music.

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Portfolio works

My portfolio consists of seven works created between 2018 and 2023. The dates refer to the time of the first public presentation.

In the four group works, my roles and activities vary. In all group works, I hold the position of artistic co-direction together with 1-3 collaborators. The working culture of the groups embraced a collective spirit, in which each member of the team contributed to the creative process. Three of the group works involve adaptations of other composers' works, and one involves the co-composition with another composer. To clarify my position, I am indicating my work-specific activities and the main authorships for each work in the following list of portfolio works. In addition, a full crediting of each work, as well as time-stamp links to individual scenes that indicate my (degree of) contribution are to be found in the separate portfolio document.

Bias Dialogs (2019)

Sound performance | 20 min
Authorship: Leo Hofmann
Activities: Composer-Performer

Ritournelle - Entwürfe für ein sesshaftes Leben (2019)

Music theatre | 80 min
Authorship: Leo Hofmann, Benjamin van Bebber
Activities: Artistic co-direction, composition, musical arrangements, audio setting, performance

kaktus firmus *(*2020)

Site-specific installation & performance
Authorship: Leo Hofmann
Activities: Composer-Performer, stage design

All Watched Over by Machines of Loving Grace (2021)

Music theatre for extremely mixed choir | 60 min
Authorship: Leo Hofmann, Lukas Huber, Zahava Rodrigo & Benjamin van Bebber
Activities: Artistic co-direction, electronic composition, audio setting design

Mixed Feelings (2021)

Co-Feeling-Opera | 60 min
Authorship: Leo Hofmann, Filo Krause & Benjamin van Bebber
Activities: Concept, artistic co-direction, composition, arrangement, music direction, object-/interface design, performance

A Singthing (2021)

Intersensory aria evening | 70 min
Authorship: Leo Hofmann, Benjamin van Bebber
Activities: Artistic co-direction, intersensory composition, audio setting, performance

The Fountain (2023)

Piece for performer, tape and live-electronics | 10 min
Authorship: Leo Hofmann
Activities: Composer-Performer

Link

The following link leads to a video showcase with documentations of all seven portfolio works:
https://vimeo.com/showcase/performing-around-music

Notes

- All works of fixed length are documented in full length.
- Videos that contain German are provided with English subtitles. Switch on the corresponding button in the player.
- The video of *A Singthing* (2021) contains a visualisation of the work-immanent vibrations.

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Introduction

If we were to offer a definition of what constitutes 'music performance', we might suggest something like: A music performance takes place if there is music being performed live. To be more precise, we might add: A musical performance takes place when humans make sound using their bodies in specific ways together with specific objects. To articulate even further, we might clarify that: Those humans active in the performance of music hear the results of their actions at the same time that others (if they are present, close enough, and able to hear) experience their sonic output. While this definition remains a simplification, the co-presence of musician, instrument, and movement in the same acoustic space remains a heuristic foundation in the collective imagination of what constitutes a music performance.

Today, media cultures and their techniques, such as electrification and digitalisation, have challenged and transformed music performances. Yet where, how, and by whom music 'happens' has become increasingly complex. As a consequence, the place where music is created and where it is presented might be considered totally independent from one another. The separation of sonic creation and its (re-)presentation have introduced new understanding of and possibilities for what musical performance is and who and what sonic actors might be. While a variety of new music formats and cultures have emerged in the last century, traditional forms of making and playing music remain alive in parallel.

My research questions in this thesis are: What does it mean to perform (around) music? How to shift the focus from designing music to designing the making and playing of music? How to widen the delicate playground between reproduced music and instrumentality? How to employ the body, sounds, materials and code simultaneously and in equal measures? And finally: How can we grasp the performativity of music in its various manifestations and in its latent intransparency? Thereby, I want to gain deeper insight into the phenomena that encircle performative actions around music.

Working as a composer-performer and sound artist, this thesis is informed by the artistic fields in which I mainly work: Western academic music contexts such as concerts, music theatres and sound performances played out in European cultural institutions. Presenting my artistic work almost exclusively in staged settings, the thesis is strongly influenced by personal experiences and questions of music's performativity. Coming from a compositional practice that is based in electronic and digital techniques, this course stays affine to such 'new media' but never loses sight of the experience that we are bodies in space and time. Through the thesis I refer to theoretical texts, the works of my colleagues and my own accompanying portfolio. My own practice contributes experiences and observation from my immediate situatedness on the stage. Works from colleagues and collaborators, as well as several theoretical texts put these observations into a broader context. I adopt a phenomenological approach in this writing that allows me better to address the aspects of how music is staged and designed. Thus, my writing portrays musical performance in the spectrum

between instrumental craft and a magic trick. From time to time, I draw on an approach of embodied recognition in order to accentuate the performative agency in music.

By locating this thesis in an academic music context, I try to touch on some of the paradoxical tendencies of advocating both tradition *and* innovation, e.g. embracing acoustic instrumental performance while at the same time seeking innovative uses of electronic instruments. The investigations take account of a profound interest of (academic) contemporary classical music in Performance Art, that has been dominant in recent years (*The New Discipline*; Walshe, 2016). While many works in this field understand 'Performance' almost as an additional expertise, method, or even material, my aim is to ask if we can look at performativity as an inherent quality that arises in various shapes and states of musical practices. Thereby, this thesis looks out for cross-links of different styles and genres, pointing out their specific designs of music performance. The notions of *performance* and *performing* I derive rather from the *Performing Arts* than from *Performance Art*, with respect to the strong links to (music) theatre in my own artistic practice and in favour of more descriptive connotation. The notion of performance stays therefore intentionally broad, but is informed by the concept of embodied recognition that defines music as a 'sonic trace of organized human activity' (Iyer, 2002, p. 394). This thesis seeks to follow the fine line where on one hand an 'inherent quality' of music performativity is addressed and, on the other hand, this quality becomes again a conscious potential for design.

I subdivide my investigations into five chapters, each of them approaching the performative aspects of music's actions around a different subject: *studio, instrument, formats & fictions, musicians* and *acoustics*. Each chapter chooses a new starting point, circles around its subject, and expands the orbit until another force of attraction takes over. In this way, each chapter takes a reference point, which is circled around to give a new horizon. For instance the chapter around instruments does not linger on violins, nor Laurie Anderson's *Tape Bow*, but approaches the phenomena of instrumentality with bare hands.[1]

The first chapter looks out for musical performativity *around the studio*. It undertakes its investigation in the 'logic of site' and therefore focuses extensively on *spaces*. As the classic sound studio enables the isolation of music production and its (re-)presentation on stage, we will have a closer look on this transfer and its entanglement with performativity. The second chapter *around the instrument* centres on moments of 'sonic manufacture'. Circling around those phenomena of sound and movement where we accredit instrumental cause and effect, I outline my notion of *music-playing*. Questioning heuristic perception patterns, the chapter addresses musical performativity in the 'logic of production'. The third chapter *around formats and fictions* investigates the role of contexts on music performances, touching on terms like audio-vision, liveness and mimesis. This chapter seeks to catch moments that inform and shape our understanding of performativity in music in its broader communication design. The fourth chapter expands the notion of the musician and asks who or what the actors of music performances are. The performativity of music is viewed in a 'logic of agency'.

[1] However, the *Tape Bow* will appear in another chapter.

With theoretical assistance, the chapter probes to track down other sonic actors than humans and their musical agency. The last chapter looks for the performativity *around acoustics*, addressing music in the 'logic of sensoriality' and thereby discovering sonic actions beyond acoustic phenomena. The chapter integrates perspectives of intersensory research and is informed by my collaborations with Deaf and blind artists.

Does music performance require embodiment? Does it produce embodiment? What is and what could become the 'performativity of music', once it is no longer (solely) about sound-producing activities? In the course of this thesis, I come to various insights around the performativity of music: From transferences between studio and stage, I derive musical agency in performative actions of creation, manipulation, and orientation. Rejecting instrumental logic, I stress an understanding of playing music as a communicative achievement. Detecting the purposefulness of performativity and the meaningfulness of sound as a heuristic formula, I derive an 'autopoiesis of music-playing'. Further, I deduce that non-human 'players of music' paradoxically highlight the human condition. Thereby we encounter resonance, networks, and tactility as compositional means. Finally, I cast the human body as a medium for intersensory music-playing, without neglecting the sense-specificities of the individual. Through this investigation and in conjunction with the accompanying portfolio, I present a compositional approach that embraces the multitude of understandings of what it means to perform around music.

1. Around the Studio

> [...] Music making is always a spatially situated, all-body practice in a concrete context.
> (Möllenkamp, 2015, p. 273, translation LH)

The recording studio is the starting point of this undertaking, although at first glance it is the very opposite of everything that is performative. While performance technique is characterised by the significance that is given to the actual moment and the physical executions of the artist, witnessed in the co-presence of an audience, the studio makes an attempt to capture ephemeral processes and bring them into material manifestations; a procedure not open to the public. In this chapter, the notion of the recording studio provides an opportunity to trace the mutual dynamics of (dis)embodiment in music but also forms a metaphor for an investigation of the hybrid spaces in today's musical performances. The human body stays present in this chapter: while it is not active (for example, 'enacting' the music), it remains occupied with questions of orientation, assurance and improvisation.

1.1. The Studio's Virtual Space

European and academic music culture in general is sometimes said to be in line with a disembodied ideal, referring to the 'concert reform' and Wagner's emblematic move to put the orchestra in the pit in Bayreuth (van Eck, 2018, p. 10). But these antecedents of disembodiment remain on a phenomenological level, whereas the studio literally abolishes the fallible instrumentalist for the (Western academic) composer. In its early days, the sound studio was a place of documentation. Records were meant to document music performances. Capturing precious acoustic moments, the early studio system and the reproduction of its manifestations repealed the necessity of human activity in order to hear, for example, a string quartet. In the second half of the 20th century, the studio became a place of creation, because 'what was meant to be a copy of a real experience has become a reality of its own' (van Eck, 2018, p. 43). This shift from documentation to creation allowed the musician's body to disappear even further, as 'semantic acts of sound creation should not be present in [the] music' (van Eck, 2018, p. 48). Instead, a disembodied ideal became the studio's ideology, famously exemplified by the musique concrète of Pierre Schaeffer, as well as the Cologne school of Karlheinz Stockhausen. This 'studio ideology' typically wants to eliminate the corporal, resonating, performative aspects of music, as well as removing time and location markers of the acoustic environment. Such a dynamic not only liberated the composer from the body of performers, but generally from 'the dictatorship of material' (Stockhausen, 2004, p. 371). This results in the idea that studio techniques *should* and *can* generate potentially any sound wave. The limiting factors shall only be time, equipment or the composer's imagination. Schaeffer's reduced listening delivered the

conceptual frame that allowed composers to emancipate from 'sound as significant'. Schaeffer's acousmatic music thereby establishes a virtual stage that does not need embodiment for its presentation, nor does it indicate embodiment in the music. This acousmatic virtual space has captured the imagination of countless composers, where they find an unlimited sonic space behind the speaker's surface and is present in both popular culture and academic music (Born, 1995, p. 180; van Eck, 2018, p. 45).[2]

This ideology carries on in the common engineering of loudspeakers as ideally neutral devices. They should shape the sound as little as possible, reducing their impact on the sound, and thereby avoiding leaving a footprint in the frequency spectrum. This hi-fi dream is one of maximum transparency, where the sound reproduction device must fulfil 'the premise that one general sound system, such as the common stereo loudspeaker system in a living room, is able to reproduce all music' (van Eck, 2018, p. 38). Together, the studio ideology and the hi-fi approaches attempt the abolition of human bodily activity and the interchangeability of spaces. However, with the body of the operator, at least one human being remains a central part of the studio, bound to a 'sweet spot' at a specific angle and with a specific distance between the studio's loudspeakers. Fixed in position and orientation, the operator becomes equipped with a maximum of overview and a minimum of movement.

1.2. A Production Centre 'to go'

We still associate the sound studios with these 'classic recording studios': rooms floating in water tanks with foam-papered walls and symmetrically placed loudspeakers with insulated cabins connected by cable strings through small windows. When Personal Computers conquered households in the 90's, they were fast enough to perform the basic functions of the classic recording studio, including recording, editing and playback of sound. Emulating acoustic and electronic instruments, PC's increasingly enabled the migration of sound recording infrastructure into private places. The formula of the home studio, defined as a 'self-assembled and designed setting in a private environment characterised by a combination of technology and the world of living' (Möllenkamp, 2015, p. 281, translation LH), was thus born. Since their rise, home studios have taken on an important role in music culture and industry as they brought back the possibilities of creating studio music in a private environment. Here, the operator still sits in an office chair, but with possible customisation and private activities, the home studio is now informed by everyday life and therefore became much more porous.

[2] By 'academic music', I mean music that is carried by representatives who have acquired their skills mainly at university and who in turn bring them back into the university. These include electronic experimental ('Sound Art') and Western classical music. Although popular music and academic music merged distinctly in the last decades, I still sometimes use this term if certain phenomena and discourse are located especially in this field.



Figure 1-1: Setup for a home studio showing, 2019 at the residency ‘Villa Aurora’

So how might a studio be recognised and defined today? I suggest we define it as a specific arrangement around a human being, providing access to sound with expandable interfaces to design sound with immediate acoustic response. In my case, the studio is my portable laptop with a pair of headphones. This studio can be situated on the train, or at home in bed. In the course of miniaturisation through laptops, the home studio became mobile in the last two decades, so that one can now take the studio ‘to go’. After the term ‘mobile music’ was coined in the wake of Sony’s Walkman, we now undergo an era that includes ‘mobile music-making’. Laptops, tablets and smartphones became the smallest units of a modular studio that can be installed and extended at different places. With this mobilisation the studio ideology becomes porous again, bringing studio and stage back closer together. It is highly possible that by now the setup in the home studio and a setup on stage are similar or identical. Performers sit down on carpets and arrange equipment in order to set up the home studio for a show (figure 1-1). Equipment that can be installed briefly before the show resembles what was a fully featured studio only fifteen years ago, only smaller.

Setups of these ‘mobile studios’ not only create the technical prerequisites but also bring along the private character of the ‘home studio’ to the stage. Proximity and orientation again become crucial means of structuring the performance space. Whereas rows of chairs in a concert situation simulate a sweet-spot scenario from the classic studio, the trend to place the audience on the floor cancels out this reference and turns the question of seating into a decision in which individual and collective corporality is emphasised. I suggest that the ‘mobile home studio’ can act as a ‘home for sounds’, interweaving the dichotomy of studio and stage. Performing around the studio therefore seeks to establish a habitat: The performer acts as the host in their home studio. The author remains co-present with their recordings, co-listening to it, experiencing it together with the audience. This author is only becoming active making minor changes like trimming the volume, or maybe one keyboard line is being played live because playing music live is still an enjoyable thing to do. The author of the studio hosts their music on stage, gathering sound and audience in a shared space. The setup therefore also becomes a question of hospitality. A good host lets the guests participate and

tries not to think too statically, constantly adapting and rearranging positions, volume or atmosphere; a new cable is installed, a microphone is connected; the host crawls over or under loudspeakers or lifts them up. Owning and sharing the home studio sets out a dramaturgical frame that unifies studio technology with an embodied access of the stage.

In the project series *Hausen* (German for 'to dwell'; 2017/2019/2021/2022), I periodically live in performance spaces for periods of days throughout the project together with my long-term collaborator Benjamin van Bebber. During these stays, we host and perform concert evenings or long-durational performances. Together with changing guest artists, our ever-changing home studio assembles heterogeneous human activities in a half-private, half-public space into a 'house of music'. 'Dwelling' in an intimate space together with sounds and guests adds up in a performative practice and resonates with anthropologist Tim Ingold's eponymy concept:

> [...] 'dwelling', explores the implications of the position that awareness and activity are rooted in the engagement between persons and environment for our understanding of perception and cognition, architecture and the built environment [...] (Ingold, 2000, p. 5)

The studio as habitat reinforces situative-ness, bodies and environment; activating the equipment, circuits and attitude of the studio as means of design; as a home of and for sounds. These strategies are articulated in my works *Teleprompter Paradise* (2017), *kaktus firmus* (2020), *Bias Dialogs* (2019), *All Watched Over by Machines of Loving Grace* (2021) and *Freilichtstudio* (2022).[3] In other art works from different fields, the home studio represents a place where closeness and distance are negotiated. *Studio Venezia* (2017) by Xavier Veilhan oscillates between exhibition and event space, blurring the boundaries between exhibition object and home studio equipment. The stage setting of Björk's *Cornucopia* tour includes a reverberation chamber that should 'capture the intimacy of singing live in a small room' (Arup, 2019) on a big stage. The stage designs of Philippe Quesne and the installations and video works of Ragnar Kjartansson often stage home studios in their works, in this case not to emphasise an intimate character, but rather deconstructing it within their artificial settings.[4]

1.3. Making a Home with Sound

Can we establish a home with sound even without the equipment of the studio? In order to back up this dramaturgical approach with a solely bodily technique, I will introduce the notion of the 'ritournelle'. In *A Thousand Plateaus* (1987), Gilles Deleuze and Felix Guattari describe how a home is built and stabilised by a sonic procedure:

[3] In the running text of the thesis, the works of my accompanying portfolio are formatted in italics *and* underlined. All other works (by me or others) are only in italics.

[4] A similar dynamic is described in subchapter 3.2. *Cinematics and Liveness.*

> But home does not preexist: it was necessary to draw a circle around that uncertain and fragile center, to organize a limited space. Many, very diverse, components have a part in this [...] one draws a circle, or better yet walks in a circle as in a children's dance, combining rhythmic vowels and consonants that correspond to the interior forces of creation as to the differentiated parts of an organism. (Deleuze and Guattari, 1987, pp. 311).

With the figure of the ritournelle[5], Deleuze and Guattari devise a sequence, in which a circular song is established. First, a centre is established through humming. Then a melody establishes its inner rules against the chaos of the world. In a third step, one enters into resonance with the outside world through improvisation (figure 1-2).

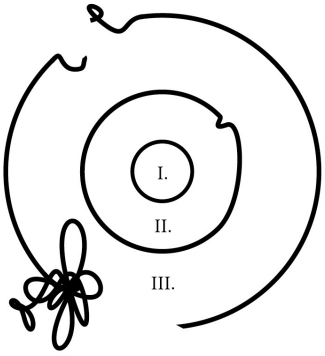


Figure 1-2: Graphic of the three steps of the ritournelle

What is interesting about the ritournelle is that a performative procedure is accessed in order to construct a home and also that the ritournelle is a sonic metaphor. Its sonic mechanism marks out territories and reconnect with the outside world through improvisation. The ritournelle introduces a specific relation between sound and body: While sound is the core and anchor of the ritournelle and forms the first step, the two following launch physical activities which mediate the sound in relation to the space. First with body movements at place, then with movements into space. In this way, the two latter steps 'mix' a stabilised centre into the world by movement. This order embraces a composer-performer mindset: In the beginning, an existing material is introduced: a song, a material, a sequence. Then improvisation follows, altering the prepared material in relation to the moment and surroundings, constantly negotiating the borders of the self and accepting one's embedding in the world. The ritournelle is preparation plus improvisation plus being aware of the witnessing outside world. These are typical performative actions that I associate with the ritournelle's steps:

I. Closing eyes, humming, shaking, touching oneself
II. Singing, looking around, torso and arm movements
III. Moving in space and singing in relation to space

This outline also reminds me of the transfer from studio to stage in my compositional practice. The abovementioned three steps I therefore find a useful tool for setting up for a concert. They propose a

[5] In the translation of Brian Massumi 'ritournelle' is translated as 'refrain'. I use the original French term because the English translation makes it a narrower musical term and also because the work *Ritournelle* (2019) in my portfolio is named after it.

strategy of reducing complexity first and then regaining it in two subsequent steps, expanding the field of action and awareness. In order to set up in a space for a concert situation, I translate those three steps as followed:

I. Building a centre by sonic manifestations brought along ('collection')
II. Structuring of the stage area in the concert space ('assembly')
III. Performance with improvisation around the stage and with its environment ('production')[6]

Sometimes the world's surging forces call for strong effort to establish a sonic habitat. In my site-specific work *kaktus firmus* (2020)[7], a temporary home is created on a logistical hub with a lot of trucks in the small Swiss village of Läufelfingen. A stage covered in yellow fabric in the middle of the concrete square becomes the site for an ongoing circle-song that holds out against the rough conditions of the industrial zone (figure 3-1). Visitors strolling around in small groups briefly settle down in a 'sounding oasis'. A prolation canon of 14th century composer Johannes Ciconia is the material for a ritournelle. The performer sings and plucks a metal 'cactus instrument' based on this circle song, attempting to establish and stabilise a welcoming place.



Figure 1-3: Establishing a 'home' in an industrial site in *kaktus firmus* (2020)

An entire evening-long piece that I co-created is dedicated to this practice of making oneself at home and carries it in the title. Based on Monteverdi's opera *Il ritorno d'Ulisse in patria*, in *Ritournelle - Entwürfe für ein seßhaftes Leben* (2019)[8] six performers encounter zones on stage, where they claim temporary homes. A few chairs, a viola da gamba, a mobile loudspeaker and a carpet help to briefly mark territories in which the performers' voices and movements attempt, like the figure of Ulysses, to 'return home'. Several wireless devices help to keep up the constant mobilisation even within electronic means. A mobile loudspeaker is carried around in circles throughout the second act, while

[6] According to Tim Ingold 'there are basically just two ways of procuring a livelihood from the natural environment, conventionally denoted by the terms 'collection' and 'production' (Ingold, 2000, p. 77)

[7] Link to video: https://vimeo.com/508973927

[8] The subtitle means 'drafts for a settled life' (translation LH). In further mentions the subtitle is left out. Link to video: https://vimeo.com/330595762

emitting the sound of a virtual harpsichord that I play on a small wireless keyboard. Thereby *Ritournelle* (2019) uses the eponymous circular song to contrast the violent reconquest of the homeland in Monteverdi's original. Arranging Monteverdi's music with electronics, voice and performative actions represents a 'home-making' from the Renaissance into my own tonal language and a detachment from any classical and instrument-orientated interpretation.

Setting up, as well as focussing on the needs and restraints are intimate considerations that underline the private aspects of making and presenting art. Clarifying these aspects via the steps of the ritournelle, inhospitable sites can become temporary homes through music.

1.4. Embodiment of the Virtual Space

After lingering around the studio as a 'home for sounds' and making a 'home with sound' with the ritournelle, in this subchapter I will come back to the studio *virtual space*, having a deeper look at the challenges that lie in the co-presence with loudspeakers on stage.

Investigating the performativity of music gives relevance to the actual moment, the social situation and the physical environment. Such an embodied approach understands perception as a relationship between perceivers and their environments (Clarke, 2005), leading to an *ecological* rather than *abstract* perception of music, as it 'stresses physical, temporal, and functional situatedness, and enforces interaction between the agent's body and its environment' (Iyer, 2002, p. 391). Such an embodied cognition defines music as a 'sonic trace of organized human activity' (Iyer, 2002, p. 394), emphasising the sound's *source* instead of abstraction of sound-in-itself. In Euclidean space, each sound is a carrier of spatial information. Sounds contain and produce localisation for the hearing being, as they indicate their source's position and information about the broader surroundings. Sound is embedded in its environmental context. An embodied cognition therefore stresses quite the opposite of the 'reduced listening' (Schaeffer) of acousmatic music. An embodied cognition that informs performativity is elaborated by Tim Ingold's *wayfinding,* which he defines 'a skilled performance in which the traveller, whose powers of perception and action have been fine-tuned through previous experience, 'feels his way' towards his goal, continually adjusting his movements in response to an ongoing perceptual monitoring of his surroundings' (Ingold, 2000, p. 220).

But what could be an embodied listening of a virtual space? How does *wayfinding* differ in situations with electronic and digital media? With instrumental music, there are straightforward ways to reinforce such an ecological perception of music by bringing the orchestra out of the pit, emphasising aspects of liveness, addressing the resonance of the performance space, highlighting the physical activities or increasing the intersensory effects that occur in the performance. But when working with loudspeakers, it is trickier to gain performativity and therefore increase a sense of embodied cognition. Looking at this more closely, we can see four problems that might arise. Problem 1: The 'human activity' might be reduced to a moment of 'we-all-hit-play'. Problem 2: The loudspeaker is

not only a sound source, but by definition it encapsulates another, its *virtual* space. Problem 3: The sources that are indicated or suggested within the virtual space can vary enormously — while occurring simultaneously. Problem 4: Unlike the reproduced sounds of acoustic instruments or field recordings, much electronic and digitally generated music might confront us with a total lack of spatial indicators.

Composer Robert Ashley describes how the listeners of recordings contribute to the virtual space behind the loudspeaker. Because the listeners project their knowledge of the world into the recording, the virtual space becomes an 'imaginary space': places and contexts of the music are evoked, as the listener consciously or unconsciously provides an emotional or semantic embedding.

> The result is an 'imaginary space,' a space that does not exist in any form in any place in the everyday world. And that space has attributes of emotion and meaning that are added by the listener. (Ashley, 2009, p. 196)

Ashley suspects that for many people contemporary academic music is so difficult to access because it does not offer an (imaginary) place for the listener.[9] Similar to Ashley's take, writer and curator Manuel Cirauqui identifies a 'structural transitivity' that is added by the listener:

> What we may call the structural transitivity of the sound recording — the listener's *a priori* assumption that a recording is "of something," something past that was, inevitably, *in space*, even the space of a machine — still emerges in radical cases where spatial indicators (background noises, directional sound, reverberation, etc.) have been minimized, obliterated, or simply don't exist. (Cirauqui, 2014, p. 1)

Both ideas cast the audience as part of the listening space, claiming that witnessing a playback of a sound recording lets the listener assume and assign an (imaginary) locus. This effect of an assumed 'a priori' even applies to electronic sounds without spatial indicators or collective imagination of their origin according to Cirauqui. The simultaneity of virtual and actual space always enacts a small turbulence in the environmental continuity, which a performer can amplify, overplay or mediate. If sounds from loudspeakers are played on stage, this assumption of the listener is an active contribution in order to absorb the disturbance of the loudspeaker's virtual space.

The clash between an 'assumed past' in the loudspeaker and the realtime experience of the performer's presence formats a specific relation between them. The loudspeaker's spatiality always has a temporal advantage over the performer, evoking a temporal parallelity that already has a locus, or a 'home'. The recorded room is *autarkic* because its space already was articulated. This results in a specific dynamic of agency with the performer. Even if the reproduction might be poor or unrealistic, the suggestion of its coherence remains intact. In return, the power of the performer lies in controlling the attention of the moment. The performer can never fully delegitimise the 'a priori' to which the loudspeaker testifies. They can, however, enforce foregrounds or backgrounds and thereby create what I call *re-localisations*.

[9] Representatives of musique concrète and musique concrète instrumental would feel affirmed here as they do not wish to introduce imagination or reference but show a reality of its own.

1.5. Re-localisations on Stage

While music on stage is often used as an easy supplier of energy in dance and theatre, it is important to me not to take this energy for granted on stage, especially in the context of music theatre and sound performances. As I still wish to utilise the full potential of pre-produced music, a transfer from studio to stage often takes place on the 'last mile' of the production: and there is a lot already happening without a performer having to add sound. Only in reacting to sounds, in positioning, orienting, approximating loudspeakers, the 'listener's imagination' (Ashley) is redirected. Grasping this potential and design it actively results in *re-localisations*, which negotiate between actual, virtual and imaginary spaces. Like every medium, a loudspeaker holds the potential to be witnessed in its *mediality* or *not* to be witnessed *at all* due to its potential transparency.

Georg Friedrich Tholen from Media studies defines the medium as a phenomenon that vanishes upon observation if you look at it (Tholen, 2002). From a phenomenological point of view, I differentiate three basic modes of how the medium of the loudspeaker's virtual space is relocated in the performance space (figure 1-4); modes of transparency (a), frame (b) and source (c).[10] In *transparency* mode (a) the virtual space (solid line) and the actual space (dotted line) merge together and become indistinguishable. As *frame* (b), the loudspeaker remains opaque while integrating this content in the actual space. At the same time, an imaginary 'tunnel' is established to a locus outside the actual performance space.

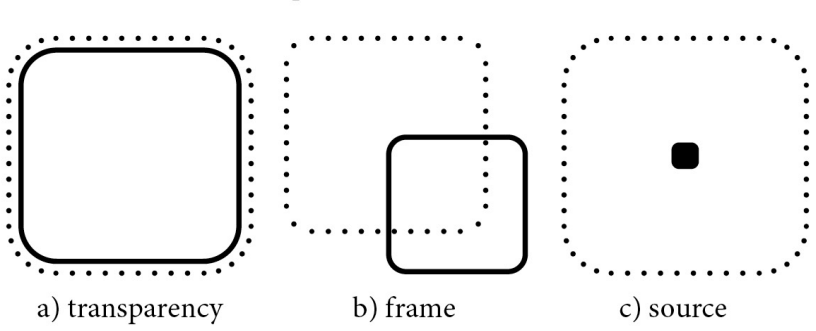


Figure 1-4: Graphic of combinations of actual and virtual space

In the sound installation *FOREST (for a thousand years...)* (2012) by Janet Cardiff and George Bures Miller, a multi-channel composition from loudspeakers hidden in the branches can be heard in the middle of a forest. The playback's sounds almost seem to test the threshold of how far the transparency works and where it fails due to unrealistic sounds (allocating the *frame* mode instead). A typical frame mode would be Samuel Beckett's theatre play *Krapp's Last Tape* (1958) for one performer, where audio spools from the main character's past become narrative windows. But in several scenes of the play, the tape voice tends to acquire the quality of a *source* (c). In these moments when the monologue becomes a dialogue, the virtual space gains performative agency. Holding up the impression of an *autarkic* status, within such a shift the 'assumed past' gets neglected

[10] In the rest of this subchapter the indicators (a), (b) and (c) refer to figure 1-4.

in tendency. Using the example of Lip-sync performances we can trace *re-localisations* into all three status. An unconvincing performance tends towards (b), a convincing one towards (c) and an unnoticed one towards (a).

There is no neutral access to the virtual space. When sound emanates from a loudspeaker, it is generated *and shaped* by the loudspeaker. Its specifics (size, position, quantity, visibility) have a great impact on which mode is perceived. Listening through headphones, a binaural field recording evokes a site full of sources (c); a sports commentary arranges auditory 'windows' combining a commentator's voice with public ambience (b); whereas an electric hum or electronic bleep becomes fully absorbed (a) within the headphones. If now diffused on stage instead of with headphones, often an inversion of the situation takes place. The field recording's spatial indicators that gave the impression of a site within the virtual space loses their captivating immersion within the performance (transfer from c to b); or the electronic hum that was fully absorbed within the virtual space, becomes a distinct sound source in the performance space (transfer from a to c).

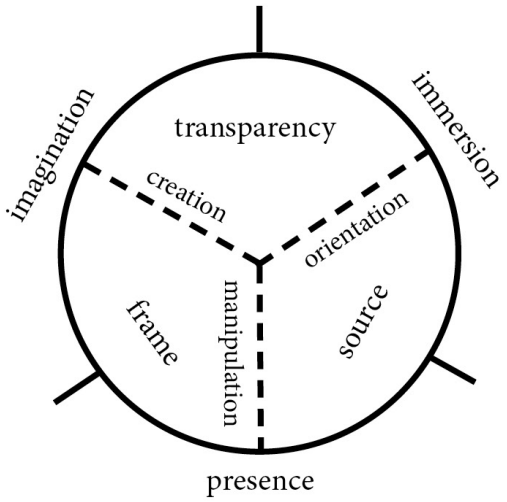


Figure 1-5: Graphic of performative 'access points' and effects of embodiment

Beside these relocation via the loudspeaker's specificities, corporal actions or attitudes of the performer have influence on this allocation. Informed by my experiences and work, I put these three modes into a triangle (see figure 1-5), from which three borders result (dashed lines). As the performer has an influence on provoking these shifts, I assign to each border a typical performative 'access point': *orientation, creation* and *manipulation*. In addition, each pairing of the three modes sets out an effect of (dis-)embodiment (outer circle). In the modes of frame (b) and source (c), the object of the loudspeaker remains opaque, obtaining physical *presence* in the performance space. In the modes *frame* and *transparency*, the loudspeaker suggests *imaginations,* such as Ashley's 'listener imagination' or Cirauqui's 'structural transitivity'. In the mode of source and transparency, the loudspeaker's virtual space can be fully absorbed in the performance space's reality, effecting *immersion*.

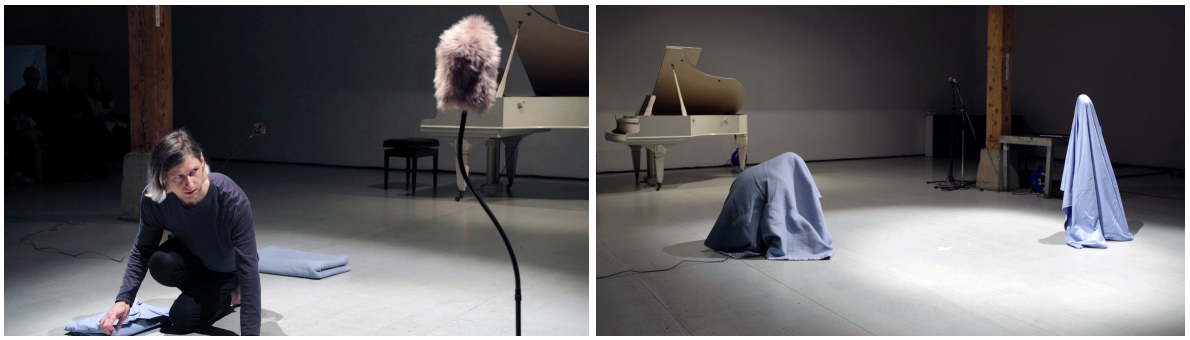


Figure 1-6: Stills of the sound performance *Bias Dialogs* (2019)

I attempt to explore these access points in the sound performance *Bias Dialogs* (2019).[11] The setting consists of a standard PA system and a small omnidirectional speaker on a gooseneck stand that emits an artificial voice and various sounds (figure 1-6). The setting is inspired by the idea of a mobile home studio. During nearly the entire piece, the performer's actions involve slow procedures of listening, orientation and movement. Along the orientation-border a performer can choose to orientate oneself either toward the actual or on the virtual spatial indicators. In *Bias Dialogs* (2019), this is constantly negotiated, looking and approaching the small loudspeaker-object; looking into the (empty) space; turning with the torso with eyes closed. The manipulations-border can be addressed via the corporality of the loudspeaker: Approaching and touching the small speaker shifts the frame (b) for a crackling fire sound into a source (c) of sound. As the loudspeaker is shaken by the performer, a small attached (physical) rattle starts to sound from the movement.[12] On the creation-border, a performer can add additional material (singing, dancing, talking), that either disturbs or welcomes the 'listener imagination' (Ashley). In *Bias Dialogs* (2019) the constant (un-)covering of sources, spaces and frames culminates in a moment where loudspeaker-object and performer are hidden under a blanket while voices shout repeatedly 'it doesn't matter if you're inside or outside.'[13]

This list of questions illustrates further the delicate fabric that I try to address as a performer in order to achieve *re-localisations*:

Orientation-border:

- What do I hear? What do they hear? Where am I? Where is the audience?
- Do I hear the specific loudspeaker? Where is it?
- How does it sound on the other side of the room?

Manipulation-border:

- What changes if I look into the eyes of audience members?
- What changes if I close my eyes? If I turn my head?

[11] Link to work: https://vimeo.com/381926649

[12] Link to scene: https://vimeo.com/381926649?autoplay=1#t=12m23s

[13] Link to scene: https://vimeo.com/381926649?autoplay=1#t=14m33s

- What changes if I point at, touch, shake or sit on the loudspeaker?
- What changes if I pretend to be the source of the sounds?

Creation-border:

- What happens if I jump to it?
- What happens if I sing to it?
- What should I sing to it and for how long?

A scenario to further discuss these assumptions is a very basic one: a performer who walks on stage, confronted with a sound played back from loudspeakers. Such a moment takes place in my music theatre work *All Watched Over by Machines of Loving Grace* (2021) where dancer and performer Joris Camelin listens and interacts with a preproduced audio drama track by various performative actions (figure 1-7).[14] The instruction for Camelin was to relate to the tape by movements and voice while trying not to take away attention from the tape, but on the contrary; even to 'amplify' the playback.



Figure 1-7: Still of a re-localisation by Joris Camelin in the music theatre *All Watched Over by Machines of Loving Grace* (2021)

The actions and attitudes of Camelin resemble those techniques of the ritournelle; situating the body in space and probing relations step by step. The tape consists of drawn-out synthetic sounds, beeping and bubbling noises that mix with kitchen noises. These sounds are projected from the ceiling of the performance space. Due to their volume, additional reverb, the virtual space evokes an 'oversized kitchen' to which the performer becomes a miniature human or even an elementary particle. In sync with a noisy accent in the tape, the performer takes a big breath. This synchronicity suggests that the tape's space has the same locus as the actual space or at least shares the timeline. In contrast, the tape's inherent suggestion of its past sets out the fiction of a previous time in the kitchen. By the co-presence with the performer, this suggestion gets attenuated or affirmed in the further course. Camelin's actions continuously create flickers between virtual and actual space, causing effects of

[14] Link to scene: https://vimeo.com/680364429?autoplay=1#t=45m30s

immersion, presence and imagination. Next to movements and sounds, different targets of his gaze produce these shifts. Looking into the audience produces an effect of immersion as if the sound is transmitted via the performer gaze, while looking toward the ceiling addresses the loudspeaker as objects and sound sources. Briefly implying a fictional dialog with voices in the tape (a), the performer follows torso movements that highlight certain elements in the tape (b). Moving with the pelvis to a zipper sound again evokes a material suggestion. Whereas the body claims to be the sound's source, the sound is absorbed (a) or channeled (b) in Euclidean space. General attitudes of taking the sounds into the performer's back (a), hands (b) or focus (c) shifts and negotiates the allocation further. As a high-frequency chirp occurs, the performer begins to search for the sound's locus within the room (c). The performer balances the modes and thereby keeps the tape's localisation open. In this process, Camelin never confirms its narrational offerings, nor does he compete with the tape for the audience' attention. This balancing is a demanding task, as a performer on stage nearly has the same magnetic effect as a television screen.

1.6. Summary

The function and the aesthetics of the sound studio have shifted in history, producing an unintentional impact on music performance itself. While the studio first abolished the performing body, I consider it today as a 'dramaturgical vessel' that can mediate the different aspects of contemporary music production and presentation. At its edges, the modular and mobile studio of the present creates a 'home for sounds' between virtual, concrete and imaginary spaces. From the ritournelle figure of Deleuze and Guattari, I derive a performative method that equips a basic experience of situatedness with a musical twist (Deleuze and Guattari, 1987, pp. 311). The three steps of the ritournelle set out a programme for basic experiences like self-awareness, orientation and improvisation. These aspects become again important in interacting with the studio's virtual space. If a loudspeaker is staged, the re-localisation of its content creates effects of imaginations, immersion and presence. The performer can influence the audience's allocation whether this virtual space is perceived rather as a *frame*, as a *source* or remains *transparent*. In an attempt to systematise the effects of (dis-)embodiment that occur in these *re-localisations*, I am deriving the three performative 'access points' of *orientation*, *manipulation* and *creation*. Performing around the studio brings attention to basic encounters in the logic of site. After the classic studio confronted musicians and composers with a physical abstraction of certain techniques and aesthetics, its miniaturisation and mobilisation allowed one to re-gain the experience that music always takes place in a specific environment and in resonance with the whole body. The orientation *in* and negotiation *of* actual, virtual and imaginary sonic spaces holds various traces of and potentials for performativity.

2. Around the Instrument

Even without consciously simulating or dissimulating, one plays 'as if'. (Moseley, 2016, p. 16)

In the previous chapter I described dis- and *re-localisations* via sonic performativity. After looking at spaces such as studio, virtual and imaginative spaces, the following chapter is more about body movements. The phenomena of (de-)synchronisation plays a key role here. This chapter begins with a basic examination of sound and movement and the question of what can be derived from this relationship for an expanded understanding of musical performance. The route always circles around the notion of the instrument as a central attractor in musical performance. We thereby mostly stay in the orbit of the human torso; around hands, voice and arms, but also we follow the performer's legs which carry their ears into space.

2.1. Sound and Movement

Trying to define what instruments are today, musicologist Sarah-Indriyati Hardjowirogo opens with the observation that on the one hand 'musical instruments are not the only things that are used to produce sound' (2016, p. 11), but on the other they 'are more than only sound-producing devices' (2016, p. 12). This outline encompasses a spectrum that contemporary experimental music often encounters programmatically. If we do not focus on the physical object of the instrument, but rather focus on its performative qualities, we will find that an essential aspect of how the act of instrumentality manifests is bodily movement.

How do sound and movement work together? We often perceive sound and movement as a continuum. The Anthropologist Helmuth Plessner therefore coined the term of the 'acoustomotoric unit' (2003, pp. 343, translation LH).[15] If we hear a strange noise in the room next door, we speculate about a movement that caused this sound. Despite all technical possibilities of reproduction, the predominant everyday experience suggests that sound is linked to and caused by movement. The presumption that the energy behind sound and movement is one of a kind informs us about our perception of our ecology whether our listening is 'contemplative or practical' (Plessner, 2003, p. 263). From this assumption derives the common concept of what an instrument is: an apparatus that translates (human) kinetic energy into air pressure energy (Harenberg and Weissberg, 2010). Even after many twentieth century innovations have overcome this equation, the acoustomotoric unit still shapes our collective imagination of instrumentality. Addressing the instrument from a performative

[15] A conceptualisation from neuroscience speaks of 'auditory-motor interactions' (Zatorre, Chen and Penhune, 2007).

angle opens up an almost choreographic approach to combine movement and sound on stage, where instrumentality itself is a means of design.

2.2. Gestalt Theory

There are indications from Gestalt theory that our perception synchronises different senses already from early childhood (Wagner *et al.*, 1981). This understanding of Gestalt theory describes principles of pattern recognition in human perception. These principles form powerful tools for how we orient ourselves in the world. It is suggested that the modes of operation are so deeply embedded in us that they function intuitively and unconsciously. The basic principles include synchronicity, proportionality and consistency (Stadler, Kobs and Reuter, 1992, pp. 14) interpreting what draws our attention, and what feels natural. According to Gestalt theory, we give more attention to sensory stimuli, if they include analogies in the timing and intensity of their occurrences (proportions). Therefore when visual and acoustic stimuli are in sync timewise or the movement intensity and loudness of a violin are in proportion, it feels natural.[16] As most of the phenomena we experience fulfil these criteria, their consistency obtains a heuristic guidance, e.g. for the impression of an instrument's behaviour.

> Each traditional instrument is characterized by various limitations and possible changes. Overall, however, an instrument's behavior is consistent, making it possible for the instrument to be learned. (Ciciliani, 2021, p. 31)

In this heuristic routine, sounds always indicate and produce sight and orientation. The sound of a sheep indicates the presence of a sheep and the position of that sheep and is therefore 'acoustic self-evidence'. The same tautology applied to acoustic instruments that affirm the principles of Gestalt theory in most everyday experiences. But in a world of fiction and animation, sound and movement might encounter entanglements that resist these principles. Our senses can be tricked in terms of a sound's source and location even without reproduction media, e.g. when a puppet next to the ventriloquist might not be the source of the funny voice. Additionally, through media turn, physical movement has ceased to be a prerequisite for making sound. The acoustomotoric unit acquired cracks during media ruptures. But these ruptures only highlight that sound and movement always show a potential to be designed: Gestalt theory and the acoustomotoric unit are not laws of nature, but heuristic psychophysical suggestions that might be unreliable.

Gestalt theory is not only useful for analysis, but also for creation, as the name already implies (Gestalt is German for 'shape' or 'form'; gestalten: German 'designing', 'creating'). Especially in the context of film and animation, Gestalt theory builds the foundation for the illusionistic production of

[16] It is important to note that in the course of this chapter this argument remains an axiom. What 'making sense' or 'feels natural' in this context are not judgements or evaluations of truth. Of course, abstract or disparate phenomena do have value and meaning and make sense - in another way.

liveliness (Chion, 1994, p. 63). The principles of Gestalt theory are the forces that are able to re-establish the acoustomotoric unit for instance in the performance of a ventriloquist or in the imitation of acoustic instruments with digital interfaces. Situations that ignore these principles are generally interpreted by human perception as abstract or unrealistic.

In my portfolio I take advantage of Gestalt theory principles as 'short flirts', building temporary and rotating alliances of sound and movement especially in my solo pieces as a composer-performer, such as in *Bias Dialogs* (2019) and *The Fountain* (2023). Thereby, much consideration goes into how to establish, change, cancel and resume the connections between movement and sound. Some moments give weight to the acoustomotoric unit while others undermine it. Balancing and timing these moments is part of a dramaturgy where playing the music is always a playing *as-if*.

2.3. Musizieren

The German verb *musizieren* essentially means 'playing music', or 'to music'; the noun *das Musizieren* translates to 'the music playing'. Both refer explicitly to instrumental action and not to compositional creation. The word m*usizieren* is rooted in a classical music context. Another characteristic lies in the social facet: Although it is possible to *musizieren* on one's own, it usually describes a shared, interpersonal practice, such as that of a string quartet or orchestra. The term evokes the image of the interplay of different players, sometimes also including the conductor. This emphasis on the communicative and social aspects might lead one to associate the word with Christopher Small's coined term 'musicking' (Small, 1998). But while Small's terminology encompasses all kinds of social participation in music cultures, the term *musizieren* describes exclusively activities in close temporal and spatial relation to the phenomena of music. *Musizieren* encompasses an immediate bodily engagement with music, which usually is represented in analogies and proportions that occur between sound and movement. A phenomenological definition of *musizieren* could therefore be: bodily actions that *seem* to enact sonic effects. This definition portrays the act of playing music as an affair that does not distinguish between cause and effect and its illusion or animation; as an 'intersensory cloud' whose shape is ultimately drawn by our perception. The difficult manoeuvre with this term is to find a compromise: Neither do we wish to keep to a narrow understanding of acoustic instrumentality as the 'fabrication of sound', nor should every performative action in a space with music be relevant for our consideration. In further writing I will use the term *music-playing* for *musizieren*, emphasising these facets that the English notion does not include.

2.4. Residual Movements

The causality of instrumental movement is rarely verified because its occurrence is usually conventionalised. In a concert of classical music, one would not question the causality out of habit, while at a lip-sync contest, the use of a playback track is a must. Music-playing on stage is therefore often a 'performative autopoiesis'. Together, the *necessity of movement for sound* and *sound as a direct consequence of movement* provide a performative implicitness, where sound and movement refer to each other. Many performances that claim a hybrid format like staged concerts or music theatres rely on this autopoiesis as a stabilising, yet meaningful ground to solve the open question of what to do on stage ('How about playing instruments?'). The reliability of this instrumental performance celebrates the acoustomotoric unit, and is mostly not a conscious design choice, but a convention. Voluntarily leaving this self-stabilising realm is dangerous, because one loses the power of Gestalt's principles that 'make sense'.

But even without the ruptures of reproduction and digital media one is confronted with blurred edges within the acoustic sphere. If we look closely, it is often impossible to say where the specific instrumental movement actually begins and where it ends — both in terms of time and space. Where do we draw the line when we lunge for the strike on the timpani? Is the instrumental movement finished at the very moment when the violin bow no longer touches the string? The causality of a person making music is always embedded in a 'cloud of blurriness'. Where does music-playing begin and end? In the continuous movement to and from the penetration of the instrument's materiality, we pass into a seamless process. One can also question whether one can actually see how music 'comes to life'. Does one see how the string makes sound or does one see only *the image* of how a string makes sound? As these examples show, Gestalt Theory strongly relies on audiovisual comparison and matching. It always takes *two* senses to 'make sense' as the notion of the acoustomotoric unit already implies.[17]

Wherever exactly we locate the instrumental action, there are always aspects in instrumental execution that are not explainable through the necessity of producing sound. These 'non-economic' aspects of movement that appear while music-playing, Viehöver and Wunsch call 'residual movements' (Viehöver and Wunsch, 2015, pp. 218). If one looks at musical performances, one will notice that most of them are saturated with residual movements. It would even be easy to deduce a repertoire of typical residual movements for each music genre. Examples include performances in Classical rock and Classical crossover, where the emotion of the music is often interpreted in the facial expressions of the performers.

[17] The restriction of this conceptualisation is further addressed in chapter 5. *Around Acoustics*.



Figure 2-1: Still of Cellist Stiepan Hauser in a live performance

The face of cellist Stjepan Hauser is constantly producing ostentatious residual movements that communicate with the audience (figure 2-1).[18] The amount and persistence of his additional miming interacts closely with the music, as if he is providing a visual layer that interprets the music parallel to the acoustic interpretation with the cello. Together, they shape the experience of his instrumental embodiment.[19]

In the theatre play *Pfusch* (2016) directed by Herbert Fritsch, one scene contains excessive residual movements (figure 2-2).[20] With mouths and eyes wide open, a ten-member ensemble hammers the keys on several pianos for over fifteen minutes — almost exclusively with fortissimo quavers. The residual movements act as relentless markers, incessantly labelling each note with a shrill exclamation mark. Each of the countless keystrokes is pantomimically underlined; every beat under the wide-open eyes seems to scream: '*Listen! To! This! Sound!*' The insistent gaze of the ensemble staring into the audience and the slapstick-like *residual movements* not only create a visually spectacular and amusing component in their exaggeration, but also corrupt the perception of the sounds. This is expressed by the director in an interview as follows:

> What I also find interesting is that the gesture influences the sound. Technically, I always have the same tone. [...] but what happens psychologically, namely in perception, is that when a very specific face, a very specific movement takes place in relation to the sound, I hear it differently. (Fritsch, 2017, translation LH)

In this way, the comedy in *Pfusch* (2016) explores residual movements as an overemphasis of the live moment that corrupts the listener's ears.

[18] Link to video: https://www.youtube.com/watch?v=JkPUS0Zdwd8

[19] It might affect his instrumental performance as well. This dimension of residual movements as self-affecting or self-hypnosis is interesting, but will not be followed up here.

[20] Link to video: https://www.dctp.tv/filme/der-alte-pfusch-ist-tot-es-lebe-der-neue-10vor11-10042017



Figure 2-2: Still of intense piano playing and gaze during Herbert Fritsch's *Pfusch* (2016)

As stated before, it is difficult to say where exactly the functionality of an instrumental movement starts or ends in space and time. If we accept that the process of instrumental execution as a pure sound production can never be separated from non-economic movements, we are able to insist on an inherent dash of theatricality in every act of instrumentality. Residual movements can therefore become (or be witnessed as) part of the musicality, part of music-playing. Vice versa, detecting and analysing these non-economic aspects of instrumental movements allows us to work with movement as compositional material. Depending on format, context as well as the kind and degree, residual movements are evaluated differently. While the term 'residual movements' is also used in other arts (in dance by the William Forsythe Company; Caspersen, D. [2007]) or named differently in music ('ancillary movements'; Nusseck and Wanderley [2009]), its conception often varies based on different aspects: whether or not and to what degree they are intended by the performer, and whether or not the audience is consciously aware of them.[21] Trying to systemise these aspects results in a little chart (figure 2-3).

[21] Conscious/unconscious and intentional/unintentional are of course not binary states, and the table only makes this oversimplified classification for the sake of the argument.

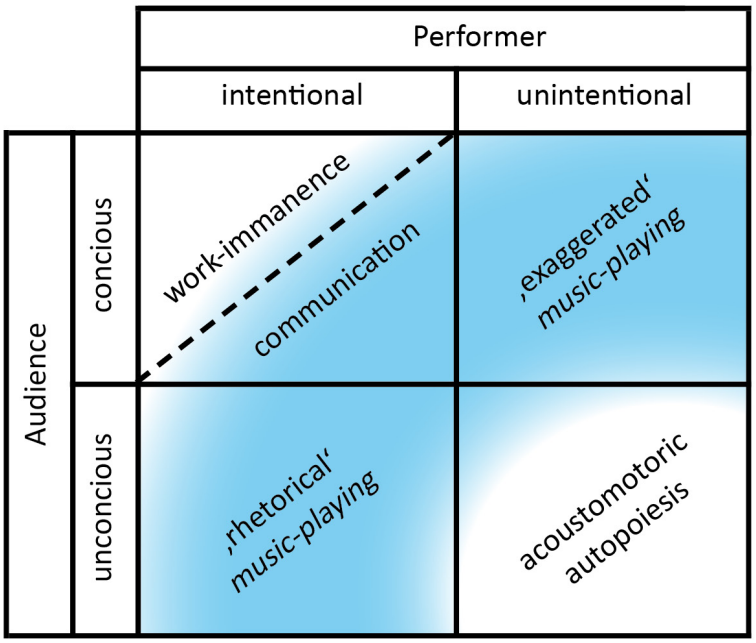


Figure 2-3: Graphic with evaluation of *residual movements*

If residual movements are not intended by the performer but consciously perceived by the audience, they might appear exaggerated (top-right), while, on the other hand, a performer's 'visual rhetorics' in music-playing are most likely not to be perceived consciously by the audience (bottom-left). Movements that are neither consciously registered by the audience nor intentionally executed by the performer comprise the supposedly 'natural state' of the performative autopoiesis of music-playing (bottom-right). As we neglected a (potential) composer-position so far, its role is important in the last upper-left category. Residual movements that are intended by the performer *and* conscious to the audience either indicate an author (composer) who has incorporated them into the work. Therefore, the body movements in *Rot Blau* (2009)[22] by Jessie Marino or *Isolated Instances* (2020)[23] by Winnie Huang are *work-immanent* in contrast to the not work-immanent, ostentatious *communication* of Stiepan Hauser's performance. A conceptual idea might cause transfers in the chart, for instance when typical residual movements of instrumental play becomes work-immanent material, as in Natacha Diels' opera series *Beautiful Trouble* (2019-2024):

> The idea behind that was to take all of the gestures that performers do in typical live performance and in rehearsal, and amplify them and choreograph them so that instead of being something that's supposed to be mostly unseen except by the performers, it becomes a significant part of the piece. (JACK Quartet, 2024)

Altogether, I identify residual movements in the blue cloud of the figure (2-3), fading out where movements in music-playing are either too work-immanent or too axiomatic.

[22] Link to video: https://www.youtube.com/watch?v=ftEd4CEhfMI

[23] Link to video: https://www.youtube.com/watch?v=hPbpFYqM4Ms

A puzzling overlay of choreographic movements and complementary actions in a traditional instrumental setting is achieved in the scenic composition *4 Hände* (2016-2020) by composers Chen Chengwen and Tobias Klich.[24] As there are always two performers playing on one instrument, it becomes indistinguishable, which movement aspects are 'economic' or 'choreographic', repeatedly forming surprising visual images (figure 2-4). The closeness of the performers' bodies shape their music-playing. Interestingly, these constellations do not appear as duos, but rather as trios. The proximity of the performers to the instrument creates an intimate space that re-incorporates the instrument as a 'further player'.

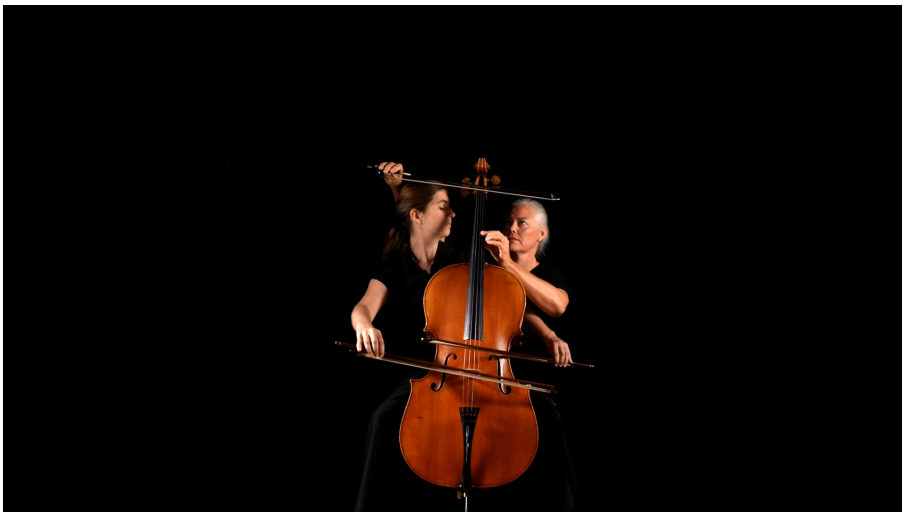


Figure 2-4: Still from *4 Hände* (2016–20) by Chen Chengwen and Tobias Klich

At the same time, the work exemplifies how the human voice often is treated differently in music-playing. While the parts for guitar, cello, and accordion are always played by two players, only one singer performs in the chapter for voice — singing overtones. The work's principle of 'doubling' is shifted into the medium of sound. But why? Of course, singing does not *require* hands – yet the residual movements of singing (including hands) could be doubled. Or, four hands could press on the singer's chest. I suspect that these options were not considered because the voice departs from a specific dualism that formats object (instrument) and subject (player) — while the voice is none of these. In the Western dualism of subject-object, the voice represents a paradox: Unlike an instrument, the singing voice is associated with the *identity* of the singer. Maybe thereby, a voice should not be 'touched', because we shy away from turning people into objects. The other facet of the voice, however, is a complete disembodiment. This is exemplified in sacred music, where the sung voice is located on a border to transcendence: In this case, the human voice *is* an object: a medium for other subjects (God, spirits or composers). But again, these mediated voices should not

[24] Link to video: https://vimeo.com/596041838

be ‘manipulated’, because of the authority *behind* the voice.[25] The solution with overtone singing in *4 Hände* (2016–20), for me, represents a compromise which prolongs the ‘doubling principle’, while maintaining this specific cultural conception of the human voice.

2.5. Complementary Actions and Conduct

In the following subchapters I would like to further examine the triangle from the chart (figure 2-3) that is labeled ‘communication’. For this realm I suggest two ideas: *complementary action*s and *conduct*. Both notions derived from the ongoing work with my long-term collaborator Benjamin van Bebber. Complementary actions[26] include movements that do not arise from instrumental control, but play around and carry on beside sonic events. We mostly use these to achieve performative *re-localisations* of fixed media in a music theatre context, balancing the virtual space of a loudspeaker in the performance space. Complementary actions can range from the bobbing movement of a performer who continues the pulse of the music through performing a drumming movement in the air to a rhythmic pattern on a playback tape (figure 2-5).

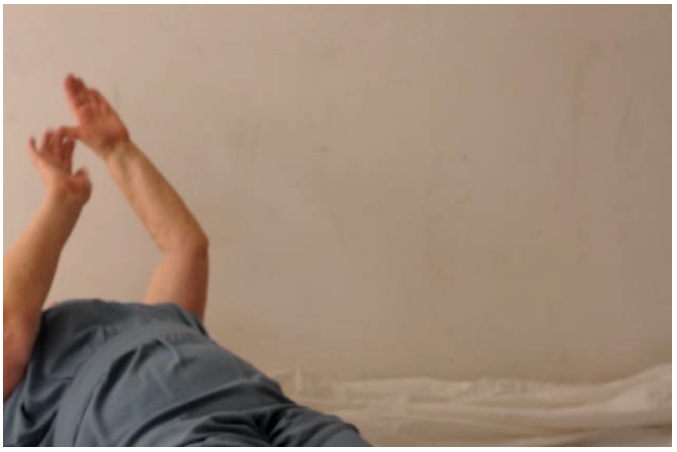


Figure 2-5: Picture of Gertrud Utecht in the music theatre work *All Watched Over by Machines of Loving Grace* (2021)

Others would call *complementary actions* simply ‘choreography’. But our nuancing of these performative actions derives from a musical mindset that seeks to alter the perception of sound. They are not movements *to* sound, but *towards* sound. And they are developed and elaborated on

[25] While Deleuze and Guattari also put the voice in the centre of their figure of the ritournelle, it were other poststructuralists that provided the blueprint for overcoming this dualism. In their writings, the philosophers Jacques Derrida and Jean-Luc Nancy attempt to make one’s own voice something foreign (towards an object in the self). I seek this foreignness and fragility of voice in all my work, both in acoustic and electronic realms. The performance *we/we/we* (2016) by Benjamin van Bebber and me is based on Derrida's *The Politics of Friendship* (1994). The piece explores the human voice between sound, physicality, meaning and community.

[26] Our original term in German is *Ergänzungshandlungen*

stage in direct relation to sound. Characteristics that might distinguish this approach further are the often strong involvements of explicit *sonic* actions (singing, humming).

The second category from our shared practice is the term *conduct* (German original: *Dirigat*), which is strongly associated with the figure of the conductor and linked phenomenologically to this specific profession. In our nuancing of *conduct*, movement and sound maintain a similar bond as in the *complementary actions*, but are switched temporally: the theatrical dash of movements in a sound context takes the opposite position timewise. Here, the movements anticipate the sounds instead of tracing them. The *conduct* 'conjures up sounds'. *Conduct* also takes place when the instrumentalists of a string quartet seek each other's gaze in the fermata. A singer closing their eyes before the first note can function as a kind of *self-conduct*, which not only executes concentration, but instructs the manner of its execution. Both notions take place on this fine border (figure 2-3, dashed line) where gestures become work-immanent (compositional material), yet they enact the music-playing as communication (an achievement of the performer).



Figure 2-6: Still of *Verwickelte Synästhesie*, part 1 (2012) by Yiran Zhao

The compositions *Verwickelte Synästhesie,* part 1-3 (20129, 'Entangled synesthesia', translation LH) by Yiran Zhao for conductor quartet playfully lingers on this border.[27] Arm movements of four conductors/musicians become a means of music-playing (figure 2-6). The gestures become part of an instrumentality that contains and even blends *complementary action* and *conduct*. While retaining their functionality as conductors, the entanglement and simultaneity of roles enacts a choreographic performance that still remains music-playing.

Picking up the time aspect of both notions results in categorising 'sound and movement' in three relationships:

- Movements as anticipation of sounds (*conduct*)
- Movements as the cause of sounds
- Movements as prolongation of sounds (*complementary actions*)

[27] Link to video: https://www.youtube.com/watch?v=m4F4Lwh1xjg

All three relations function together as performative actions that become a new kind of instrumentality. As these categories take advantage of the principles of Gestalt theory (synchronicity, consistency, proportionality, etc.) they maintain the kinship to a traditional understanding of acoustic instrumentality. It is important to notice that the concepts of residual movements, *complementary actions* and *conduct* are based upon a comparison of acoustic and visual sensations — a factor that will become more relevant in the chapter 5, *Around Acoustics*.

2.6. Extramusical vs Concert-ish

It has been the subject of much writing how Classical concert culture cultivated an ideology of music as a purely audible affair, whereas non-sonic aspects are reduced and discredited. In contrast to aristocratic representative show-character, where senses and arts were mixed with social activities, the emerging bourgeoisie devoted itself solely to the work concept and the media specificity of music as a solely acoustic phenomenon (Goehr, 1992). The devaluation of exaggerated *residual movements*, for example the evaluation of Hauser's facial expression as 'Kitsch', which presumably is frequently socially driven, still reflects this conception. In this thinking, there is an essentialistic core (music), which 'gets infected' by extramusical material, as musicologist Seth Kim-Cohen puts it:

> Only music includes, as part of its discursive vocabulary, a term for the foreign matter threatening always to infect it: 'the extramusical'. (Kim-Cohen, 2009, p. 39)

On this ground, pioneers like Mauricio Kagel, Dieter Schnebel, George Aperghis, and Vinko Globokar found individual ways to integrate extramusical material into their compositions. Many of them explicitly located their work in the field of music theatre while maintaining their rooting in Western music culture. For musicologist Björn Heile, the whole genre of experimental music theatre 'is based on the investigation of these relations between sound and movement and that it thereby plays with our perception and cognition' (2020, p. 217). However, this relation is often formatted in a very specific way: In experimental music theatre 'music-making *is* the dramatic action' (Heile, 2006, p. 79) — but not vice versa. This formula that I outline as 'performative autopoiesis' reproduces certain hierarchies of the (extra-)musical, that the genre programmatically sets out to overcome. It is interesting to consider that the whole genre of music theatre could be described as the cultivation of a self-declared problem, since it holds a promise to (equally) merge the art forms of music and theatre.[28]

As another music format with multidisciplinary promises, opera holds even cruder biases. In the reputational hierarchy of musical forms, opera stands at the very top, and this despite the fact that opera displays a potpourri of assembled arts. More 'extramusical infection' of music culture is scarcely possible. Unlike experimental music theatre, opera does not even attempt to integrate or

[28] Opting out of this 'formula', we find (mostly American) pioneers like Yoko Ono and Pauline Oliveros whose scores require nothing but embodiment as well as Laurie Anderson and Robert Ashley whose work embraces narration, Video Art and Pop culture to a much higher level of autonomy in the overall approach.

control the extramusical material by integrating it into the composition. This exceptional role that opera holds is borne out by the tendency of even those composers who have belonged to a serial and purist school for all their lives to nonetheless write operas at the peak of their careers. It seems that European Classical music has accepted the singular case of opera, because the supposed contamination of musical autonomy is always balanced out by the prestige of the ultimate form factor of opera.[29] Going a step backwards from the 'infected' music theatre to 'absolute music', we find the adaptation format of the 'concert version' (German: 'konzertante Aufführung') of music theatre. In a concert version of an opera, the extramusical aspects are excluded from the performance: no props, no stage design, no costumes, no un-economic movements of the singers. Adaptations such as concert versions always tell us a lot about what is deemed to be a format's core or essence — as I have never seen public libretto recitation, nor a 'costume version' of an opera, which does not include the music.

Experimental music, especially in the context of the Darmstadt School, has increasingly devoted itself to vocabulary and aesthetics from other arts: Media Art, Video Art and especially Performance Art. Composer Jennifer Walshe's proclaimed and widely cited 'New Discipline' explicitly embraces this integration, canceling the differentiation between (absolute) music and music theatre, stating that 'these compositional techniques - they are not "music theatre", they *are* music' (Walshe, 2016, p. 2). While the following debates quickly became entrenched in the positions of 'the traditionalist' and 'the progressive', there has been little exploration of the kind of 'dialectic' behind the extramusical conception. Does the way performative elements are addressed by us 'progressive composers' still reproduce a hierarchy of an essentialistic core (music) and the extramusical in the genre-specific 'expansion of material' (German: Materialerweiterung)? From a very long-term perspective[30], it would be worth discussing how Western academic music cultures even cultivate this dialectic of 'sound-itself' and the extramusical. It seems reasonable to assume that such dualism is driven by an abstract understanding of music, where composers sit at their desks, whereas an ecological understanding empowers the performer's position on stage. This could explain why most positions from the 'Darmstadt field' maintain the author/interpreter-duality, (although they often praise the concept of the composer-performer). Rather, the composer gains control over the performers' bodies. Cellist Jay Campbell states to the *Beautiful Trouble* series (2019-2024) by Natacha Diels:

> The way that a lot of other composers control our bodies with the way we play our instruments; that's been kind of expanded out into how we use every limb of our body. So our heads are being controlled, the direction of our head motions, our eyes, everything. (JACK Quartet, 2024)

When the 'tiny head movements alongside complex bow manoeuvres' (Walshe, 2016, p. 1) become scored as the composer's material, this distinguishes them from my conception of *complementary actions* and *conduct.* These arise from a performer's authorship and motivation or out of a shared

[29] It should be mentioned here that there are many different forms of opera and music theatre. Although classical European opera is an emblem of so-called high culture, a closer look at history reveals a complex interplay of formats that move fluidly between high culture and popular culture(s), such as operetta, vaudeville and musicals. This complexity will not be discussed further here, as the primary focus is on discussing the concept of the extramusical and its embedding in different genres.

[30] The *New Discipline* refers to Dadaism and Fluxus and thereby places itself into a broader music history.

rehearsal process. Education and academia in majority still offer courses in either instruments *or* composition, reducing 'performativity' to a mere additional competence. The interest of music culture in performativity is thereby being held back from developing new questions and aesthetics in this direction. Nevertheless, the pioneering works and writings from Walshe and the affiliated representatives of the 'New Discipline' started a liberating and self-empowering momentum that carries through to the work of ensembles whose members come from music culture but identify instead as performance collectives like *Bastard Assignments, kollektiv international totem (KIT)* or *Untere Reklamationsbehörde*.

A rich body of work that is deeply informed by music culture and achieves a non-hierarchical integration of movements is presented by the duo of Jonathan Burrows and Matteo Fargion. Coming from two disciplines, their work not only merges knowledge from two artfields (Burrows/Dance; Fargion/Music) but furthermore, they agree on a fully shared equal practice. From their performances one cannot tell what their respective roots were, nor is their work taken note by only one art field.



Figure 2-7: Still from *Both Sitting Duet* (2002) by duo *Burrows & Fargion*

Their famous *Both sitting duet* (2002) consists mainly of body arm movements of the two performers sitting next to each other (figure 2-7).[31] Sequences, repetition and variations of (a)synchronous movement patterns set out a musical quality to their choreography. Within the movements, one thinks one can distinguish what is the 'material' and what are residual movements — without noticing any hierarchy between them. Although the piece does not involve acoustics it is clearly a music performance as if they were playing on instruments — or rather *dancing* with *invisible* instruments.

[31] Link to video: https://vimeo.com/361765765

2.7. Between Legitimacy and Primacy

I have already pointed out that the terms *complementary actions* and *conduct* were born out of practical rehearsal work. An important moment in this process was the development of an adaptation of Franz Schubert's song cycle *Die Winterreise - Vorstudie für ein nomadisches Leben* (2016) for electronics.[32] It was the second collaboration with Benjamin van Bebber, who is a trained music theatre director, but in this and other works, we are both performers and co-creators. Much of our vocabulary appeared in the *Winterreise* (2016) for the first time. I would like to discuss the emergence of this vocabulary in connection with observations on residual movements, extramusical and sonic agency.

Faced with the experience that compositional work and computer programming are difficult to manage during rehearsals (especially if one's on stage), I prepared as much as I could in advance. The instruments and interfaces for the piece, the sound material and the interconnecting programming was highly elaborate on the first day of rehearsal. It was a somewhat typical 'from-studio-to-stage' procedure. This 'sound-first' approach promised to provide more freedom in the choreographic design. The project was planned to be much more 'dance-ish', than the result turned out to be. But our choreographic ambitions turned out to be tricky to accomplish. Our impression, and that of our collaborators was that all explicit choreographed movements were disturbing. Not being confident as dancers certainly had an impact on the general feeling that the movements of our bodies needed legitimisation. So we decided to only allow movements that were necessary for making music. We established a 'primacy of sound', always strictly questioning ourselves whether the movements were actually backlinked to sound; if they were *sonic actions*. Once this harsh rule was made explicit, we discovered that 'only singing' and playing the instruments already required a lot of movement. Performative actions were therefore integrated not as extramusical material, nor as a composed layer, but with respect to their sonic agency.

[32] The subtitle means 'preliminary study for a nomadic life' (translation LH). In further references the subtitle is left out. Link to video: https://vimeo.com/175445607



Figure 2-8: Still of the song ‘Die Krähe’ from the *Winterreise* (2016)

The simplest way to regain choreographic activities as music-playing was to move as a tool to ‘hear better’ or differently, to mix one’s own hearing through moving around in space. Normally, musicians do not walk around much during a concert. In fact, we do it quite often in our *Winterreise* (2016), but always in this function of mixing our binaural hearing. A change of position is sometimes necessary in order to mix the sound sources better for oneself, to hear one’s own voice better, to project sound from a different position and then verify it from the distance of the audience. Comparing two different positions lets one map how the sound might be experienced in the rest of the room. Since we played in very different venues and our adaption includes two small loudspeakers with sharp angles of diffusion, this procedure proved to be essential. Moving the head, changing the ‘listening angle’ and changing the positioning of the mobile loudspeakers became sonic actions in the song ‘Der greise Kopf’.[33] Whether the necessity of music-playing justified the movements or if they were a mere excuse for choreographic processes, was a constant balancing act. Becoming confident with our decisions, we slowly gained a ‘safe territory’. From there, we began step by step to further expand the field of what sonic actions could include. In the acapella adaptation of ‘Der Wegweiser’ Benjamin’s arm movements function as *conduct* for my singing.[34] During ‘Die Krähe’ I play a bass line on the keyboard and he runs across the stage with a wireless loudspeaker and microphone, generating feedback (figure 2-8).[35] Although this scene — especially in the crow’s concluding guttural cries — contains highly exaggerated residual movements, a tie-back to sonic actions can also be discerned in this case. Running with the devices enables and shapes chaotic feedback, and the spatialisation of sound. Moreover, Benjamin repeatedly described the resulting exhaustion at the beginning of ‘Die Krähe’ as a prerequisite for producing the shrill cries at the end of the song. The burst of movements thereby had a (temporally delayed) instrumentality about it that reassured us that we were only performing sonic actions.

[33] Link to scene: https://vimeo.com/175445607?autoplay=1#t=37m07s
[34] Link to scene: https://vimeo.com/175445607?autoplay=1#t=23m19s
[35] Link to scene: https://vimeo.com/175445607?autoplay=1#t=32m13s

Although our self-imposed ‘catalogue of rules’ was only a work-specific solution, the open question of how to relate sound and movement is inherent in every act of music-playing. For classically trained musicians it is a common experience that one feels uncomfortable performing non-instrumental actions on stage. Music theatre works and sound performances often challenge musicians because they are asked to do *more* than music-playing. This sets us out on this thin line between ‘extramusical action’ and an outcome of ‘instrumental embodiment’, that we derived in making the *Winterreise* (2016). Encountering performative actions as sonic actions allows one to enhance performative agency on stage while maintaining a ‘primacy of sound’ with which trained musicians are so affiliated. This was relevant in the development of several of my pieces like *The Reply* (2016), *Hey Leo* (2018), *Bias Dialogs* (2019) and *A Singthing* (2021) in order to establish a somewhat ‘concert-ish performativity’. Awareness of the dialectics that mutually exoticise *and* integrate the extramusical might help to re-evaluate sound and movement in a far more relaxed and unpretentious manner.

2.8. Summary

Starting with the notion of the instrument in this chapter, the path leads to phenomenological estimation of sound and movement. Normally, the relationship of sound and motion is perceived as stable, as with any relationship of cause and effect. Together sound and movement build an *acoustomotoric unit* via the principles of Gestalt Theory that are affirmed by the indicators of synchronicity, continuity and proportionality. This ‘unit’ has the tendency always to (re-)establish an ‘auto-poiesis of instrumentality’, therefore performer and instrument stabilise each other on stage. But the relation of sound and movement is blurred at its edges, even without any media technology. After clarifying a nuanced notion of how I define music-playing (German: *musizieren*), a systematisation of so-called *residual movements* underlines the phenomenological impact of how the borders of instrumentality are evaluated. Conventions and dramaturgies moderate genre-specific ‘rules’ of what is (or is not) considered music-playing. Proposing *complementary actions* and *conduct* further investigates music-playing around the bare ‘manufacture of sound’: body movements that anticipate and prolong themselves around sound, creating temporal and spatial emphasis. After lingering on movements and gestures, the chapter continues with a closer look at the ‘concept of material’ in music theatre, opera and (academic) music culture: its extension and its implicit hierarchies. It is found that in these contexts performativity is often narrowed to a composer’s (expanded) material or a performer’s (additional) expertise. Along the struggles with a piece from my own artistic practice (*Die Winterreise*, 2016), I discuss whether a proclaimed ‘primacy of sound’ enacts a performance-informed music-playing or just again installs a dialectic of ‘musical vs extramusical’. This proves to be a thin but crucial line since thereby the work-specific relations of performativity and instrumentality are established and evaluated.

3. Around Formats and Fictions

What the eyes see and the ears hear, the mind believes. (attributed to Harry Houdini)

After looking at movements around the performer's physical body in the last chapter *Around the Instrument*, this chapter is about the role of formats and their dramaturgical impact and effects. Whereas the other chapters stay in the realms of sound performances and music theatre (the genres of my portfolio) this chapter expands to other media and formats, looking for (dis-)embodiment in format transfer and translation. After a closer look at the design challenges and styles of digital music interfaces, we encounter different phenomena and notions like *liveness* and *mimesis* in order to find musical performativity around formats and fictions.

3.1. Communication Design

We already touched upon the heuristic rule that the making of sound always involves a translation of an energy of movement into acoustic energy (Harenberg and Weissberg, 2010). While this acoustomotoric unit was self-evident for a long time, the media ruptures of electrification and digitalisation made the experience of this translation sometimes abstract and vague. In the first chapter *Around the Studio,* we already investigated the loudspeaker; a device that best exemplifies the principle that the energy translation is latently inaccessible. Although we (sometimes) can see the membrane of the loudspeaker move, we cannot sensually retrace the electric translation of energy. The same disconnect is all the more apparent in sophisticated uses of electronics and most apparent in the realm of digital music instruments and interfaces. Since the beginning of my artistic practice, I have been using such interfaces in the works *A. wie Albertine* (2012)[36], *The Reply* (2016), *Teleprompter Paradise* (2017)[37], *Hey Leo* (2018)[38], *Bias Dialogs* (2019) and *The Fountain* (2023). Creating these pieces I observed an interdependence that is probably recognised by most developers and musicians who work with their own digital music interfaces (DMI): One not only has to build the physical object, but also code the sensory input into a sonic output. Last but not least, one has to find ways to perform with the interface. The possibility to adjust in all three segments can result in a never-ending loopback, leading computer music researcher Perry Cook to state: 'Programmability is a curse' (2001, p. 1). Approaching this field with openness becomes even more difficult because DMIs are often localised in academic music culture where the physical mastery of an instrument is still an

[36] Link to video: https://vimeo.com/56175474
[37] Link to video: https://vimeo.com/216648114/41d44818d2
[38] Link to video: https://vimeo.com/299329647/b7db931155

indicator of the quality of the audible result.[39] At the same time, going beyond the physical restrictions of acoustic instruments can in turn raise the expectation that the use of DMIs must be spectacular. When it comes to the performer's body, many reflections on DMIs touch on the fact that the connection between movement and sonic result is arbitrary (Jordá, 2005, p. 169). For many people, 'what is witnessed is a disconnect; between performer and audience, and between performer and instrument' (Armstrong, 2006, p. 3). Facing the lack of physical affordance and restraints confronts developers and composers with questions that often go beyond their actual interest or competence: How to design movement? How to choreograph the movements that control the sounds? Where physical performance is able to connect to any sonic wave, the dramaturgical guidance within the music-playing becomes crucial. Nevertheless, it appears to me that often this choreographic potential is underplayed in order not to become vulnerable on account of its visual appearance. The design of instrumentality therefore often tries to navigate between a 'one-gesture-to-one-acoustic-event'-approach and the avoidance of 'mickey-mousing'. But in fact, 'choreographability' is just *another* curse.

Choreographing the DMI's music-playing is an (involuntary) obligation. Although the technical use and artistic goals of the makers of DMIs may be very different, the engineers and artists are faced with the dilemma of either accepting the 'disconnect' or falling back on a movement repertoire that is characterised by acoustic instruments. Choosing these analogies over new couplings is what design theory calls *skeuomorphism:*

> [...] a skeuomorph is a derivative object that retains ornamental design cues to elements that used to be—but are no longer—integral to its structure or operation. (Moseley, 2016, p. 41)

Therefore, new instruments often imitate established instruments, for instance Laurie Anderson's famous *Tape Bow*.[40] Such a skeuomorphism of instruments often not only includes the visual appearance, but also the embodied recognition of instrumentality; designing analogies to acoustic instruments with respect of range, detail or effort, along the principles of the Gestalt Theory. Characteristics of the human body like the rhythm of breath, the precision of fingers, or the stability of feet (Iyer, 2002, p. 396) are often integrated in the (re-)design of music-playing. The fact that traditional instruments often do not even provide the level of transparency that is demanded from DMIs suggests that the intangibility of the latter even heightens an urge for an embodied recognition.

Nevertheless, there are also DMI developers that abandon the characteristics of acoustic instruments (Robert Torche's 'tennis ball'-DMI[41]), or merge them into hybrid meta-instruments (combination of voice with DMI data gloves by Franziska Baumann[42]). Overall, the lack of common objects, code and choreography style leads to highly individual solutions of design and usage. Systemising the design strategies for DMIs, Steve Benford suggests four possible tendencies: *expressive, secretive,*

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[39] Several concepts investigate this field of interaction design, mapping and engineering, especially via the *New Interfaces for Musical Expression* (*NIME)* conferences and publication and the former activities at the *Studio voor Elektro-Instrumentale Muziek* (*STEIM)* Institute Amsterdam.

[40] Link to video: https://vimeo.com/589418427/bcaf06cd4b?autoplay=1#t=2m44s

[41] Link to video: https://www.youtube.com/watch?v=7xzqc4qC3AA

[42] Link to video: https://www.youtube.com/watch?v=TexNTXbaG0w

suspenseful and *magical* (2010, p. 56). These result from different constellations of two variables. The first variable reaches from soft to strong 'manipulation', which represents the sensed movement input. The second variable reaches from soft to strong 'effect' and represents the sound output. The two strategies *expressive* and *secretive* follow a linear, 'proportional coupling' of input-output: Strong manipulation results in strong effects, respectively less manipulation also leads to less effects. Thereby *expressive* and *secretive* follow a skeuomorphism design via the principles of Gestalt Theory. The situation is different for *suspenseful*, where the spectators witness much movement input but little sonic output and for *magical,* where less input results in strong output.



Figure 3-1: Still of Andi Otto's *Fello* set

An example of an expressive design is musician Andi Otto's *Fello* set.[43] Otto plays a hybrid setting, consisting of a cello, two foot pedals and a sensor on the bow, sampling and processing the cello input signal (Figure 3-1). Since his *Fello* (*'f*ollowing c*ello'*) setting did not change for years, Otto's music-playing attests to such embodied practice that we know mostly only from acoustic instrumental mastery. Otto's unique movements on the *Fello* are astonishing, because they are intuitively understandable thanks to skeuomorphism and at the same time they address a physical and a digital instrument simultaneously. According to Otto, he consciously stopped the 'curse of programmability' by addressing upcoming challenges in the setting only with further bodily practice.

In contrast to such a trained embodiment that results in an instrument-ish appeal, my own occupation with DMIs takes on a work-specific route, involving more dramaturgical considerations. *The Fountain* (2023)[44] uses DMIs in the form of two wireless movement interfaces with built-in sensors (accelerometer, gyro and tilt) on my wrists. Sitting on a chair the performer (me) executes movements with hands, arm and torso accompanied by occasional singing. The programming couples specific arms movements as well as parameters from the microphoned voice to certain sound samples or live-electronic processes. The piece starts with a movement vocabulary that is based on playing 'pocket tricks' with cards. The hands form an empty ball and as they start shaking vertically, the rattling sound of dice can be heard. Thereupon, the empty hands are then presented to the

[43] Link to documentation: https://www.andiotto.com/fello

[44] Link to video: https://vimeo.com/1114556776

audience. While the hands close and open, nothing is enclosed or revealed physically, but the according sounds set out 'material suggestions'. In the course of the piece, a game of absence and presence is played again and again. The ever-changing combination of input-output in the course of the piece follows a *magical* design strategy in the notion of Benford (2010). A few, controlled 'manipulations' stand in relation to ever new and varied 'effects'. Thereby, in *The Fountain* (2023) the programmability of DMIs gets framed by the scenario of a magician's act. Compared to Otto's *Fello*, my approach sometimes seems to me as if it is taking the exact opposite path. Instead of a stable instrument and years of practice, I create work- and scene-specific programming that requires the body not for musical expression but for execution of music structure. Using DMIs in experimental sound performances offers the possibility to design *music-playing* almost from scratch. While different designs result in different kinds of (dis-)embodiment, the performer's situatedness overall remains present. Often, the DMI's performer is present in the different roles of builder, composer, performer, demonstrator, researcher, communicator — increasing the level of personal involvement.

3.2. Cinematics and Liveness

Going further along the path of disembodiment and abolishing the performer's situatedness, we could imagine witnessing a live performance as a solely audio-visual affair; like a film on a screen. In such a 'television scenario', the performative aspects of the performance space and the corporeal coexistence of audience and musician(s) are thus excluded. In this reductionist 'cinematic setting', the expectation and comparability of embodied agency is dulled, handling the front of the stage as a screen and establishing an aesthetic of the 'fourth wall'.[45]

In *Sensate Focus* (2014) by Alexander Schubert, five musicians each stand under one spotlight (figure 3-2).[46] The flickering and harsh light changes create the impression of (film-like) cuts in which the music-playing is both fragmented and focussed. The visual isolation of the individual performers separates them so sharply from each other and from the space that it even gives the impression that their bodies are not only illuminated, but rather 'switched on'. While the visual traceability of the music-playing gets dulled and defragmented, more and more *complementary actions* sneak into the mise-en-scene. Several works in contemporary composition accentuate the instrumentalist bodies via the use of light or video. In Michael Beil's *exit to enter* (2013) a similar disembodiment is pursued.[47] The performing bodies are isolated individually in two-dimensional frames by sharp headlights. In addition, each performer is joined by a video double, producing an indistinguishability of live presence and video playback. The design of both pieces is inspired by cinematic tools of cut and montage. This effects a kind of 'reversed performativity': witnessing the performance, one marvels at the fact that it looks as if it were *not* live.

[45] A term from theatre culture, which describes the suggestion that the performers cannot see or witness the audience as if there were constantly a wall between them.

[46] Link to video: https://www.youtube.com/watch?v=wMH54JeYNF4

[47] Link to video: https://www.youtube.com/watch?v=7eR73RQk8kU



Figure 3-2: Still of *Sensate Focus* (2014) by Alexander Schubert.

Film theorist Michel Chion insists on the 'disparate natures' of visual and auditory perception in his book *Audio-vision* (Chion, 1994, p. 9). The cognitive patterns that write what he calls the 'audio-visual contract' are largely the same as the principles of Gestalt Theory (Chion, 1994, p. 58). By investigating their interplay in detail in the realms of film, Chion's prosaic attitude puts ideas of 'audio-vision counterpoint' or 'sensory equality' or comparability in place, claiming that 'there is no image track and no soundtrack in the cinema, but a place of images, plus sounds' (Chion, 1994, p. 40). If we face cinematic live performances, what 'writes their contract'? How do the 'disparate natures' (Chion) of visual and auditory perception inform those compositions? For instance, auditory perception has no equivalent of directed gaze and eye contact, whereas auditory specificities like spatial resonance and omnidirectional perception produce effects of depth and volume differently.[48] Or the fact that visible things are visible without precondition, whereas most things need to be in motion (or moved) to be heard, formatting a different modality of the senses.



Figure 3-3: Stills of *The Reply* (2016)

A work of mine which follows a cinematic design while still incorporating the audience into the ecological situation is *The Reply* (2016)[49]; a composition with video, live-electronics (motion sensor

[48] This 'lack of spatial resonance' was often mentioned in the rehearsal processes with my mixed-abled music theatre group *[in]operabilities* when creating music-inspired sign language poetry.

[49] Link to video: https://vimeo.com/177801354 In this piece, music theatre director Benjamin van Bebber helped as outside-eye and performance artist Filo Krause performed in the video recording.

and voice processing) where I perform alongside a video double (figure 3-3). The piece sets up the fiction that the two communicate. Again and again, the two seem to react to each other via sound and movements and facial reactions. Putting on ear-buds and a sensor on my wrist in the beginning suggests communication channels between the two. By having both instances fix the audience with their (our) gaze, the aim was to integrate the audience in the communication by fictionalising them as the media between the duo's eyes. *The Reply* (2016) thus reintegrates the audience with effects of liveness despite the 'audio-visual' appeal of its setting. At the same time, the piece thoroughly embraces what Chion calls *synchresis*: an effect that Chion combines out of *synchronism* and *synthesis*, that describes 'the spontaneous and irresistible weld produced between a particular auditory phenomenon and visual phenomenon when they occur at the same time' (Chion, 1994, p. 63).

The opposite route to a cinematic approach is to highlight the effects of liveness, generally associated with presence, interaction and responsiveness of performers in relation to the actual movement. As the studio ideology formed a virtual stage, in return this trend gave live music culture its own 'currency', emphasising corporeality, authenticity and immanence (emblematic in 'rockism'). As liveness is addressed as a fundamental currency in all sorts of music performances, its conception has the tendency to emphasise a binary formatting. Several studies about liveness stress that '[t]he term live makes sense only when there is also the potential for something that is not live' (Fritsch and Strötgen, 2012, p. 49). How much usage of backing tracks is appropriate, accepted and expected is mostly clarified in the music format or style.[50] Both spheres therefore maintain a double-bind relation, in which liveness 'is actually an effect of mediatization, not the other way around' (Auslander, 2008, p. 56). The term *Interaction Art* might exemplify this formatting: While playing a string quartet involves much interaction, it is too self-evident to mention, whereas the term is used in the context of Human-Computer-Interaction (HCI), where the interaction is more improbable and valuable. Also the term 'live electronics' contains such tension. This reciprocal reference is summarised as follows by Philip Auslander:

> [W]hereas mediatized performance derives its authority from its reference to the live or the real, the live now derives its authority from its reference to the mediatized [...].
> (Auslander, 2009, pp. 43)

A format exploiting both the 'autopoiesis of music-playing' and *synchresis* (Chion) is the fan culture youtube-genre of *shreds.* Here, the video of a live moment of music-playing is dubbed with a new audio. In the new audio track, however, the music played is as 'badly' as possible, with wrong intonation and rhythm, thus creating comedy. However, in the making of *shreds*, much care is taken to ensure that the subsequent montage of image and sound still appear realistic. The principles of Gestalt Theory are carefully applied in order to make it seem realistic. The comedy is created through the contrast of a high quality video appearance and the terribly played music. Thereby, the power of *synchresis* evokes a version of the band *The Cure* in a parallel universe, in which they make incredibly

[50] For instance, anyone attending a concert of contemporary music with acoustic instruments including live electronics would expect the instruments to be played live. The live electronic is rather expected to diffuse its own material. Nevertheless, amplification or sound processing of the acoustic instruments would be permissible.

bad music with utmost seriousness.[51] The acoustomotoric unit does not require any causality in order to work. A kind of 'reverse shred' is Mindaugas Piečaitis' *CATcerto* (2009), in which a video of a cat playing a piano is accompanied by an orchestra (figure 3-4).[52] In a specially written composition, a live ensemble refines the disparate, spontaneous playing of the animal, effecting a *synchresis* in which the cat obtains the full agency of a professional pianist.



Figure 3-4: Still of Mindaugas Piečaitis' *CATcerto* (2009)

In a way, liveness and mediatisation enact mutual production and extinction. Coming back to the 'cinematic performances' previously carried out, the 'liveness effect' of *Sensate Focus* (2014) is therefore paradoxically that it looks like a video. The performers' presence is no longer the reason for music to happen. Rather, their live presence reassures the audience that the illusionistic effect took more effort than if it had come from the screen. According to musicologist John Croft there are 'two opposed tendencies of music in the twentieth century: between the attempt to reassert the importance of bodily presence and performance, and the purgation of that presence in favour of a disembodied sound production' (Croft, 2007, p. 60). Setting up 'cinematic conditions' and messing around with liveness takes these tendencies to their extremes, but also underlines their mutual dependency.

Although numerous artists comment on the relation between studio music and live music[53], most attempts are highly conventionalised, either to separate the spheres of the fixed and the ephemeral forms or to simulate each other. Mediatised manifestations of sound pose the questions *if* and *why* liveness should take place at all. Why mute one track of a session for the concert, in order to play this one keyboard melody live? Why not leave the recording in the backing track like the rest instead of re-enacting the melody's moment of recording (which might never have taken place like the audio

[51] Link to video: https://www.youtube.com/watch?v=OvNuArAFFF8

[52] Link to video: https://www.youtube.com/watch?v=zmLuEkpij5E

[53] Examples are Paul Hindemith's *Grammophonmusik* (an early example to use a device of reproduction in live context), the band *Kraftwerk* (A deliberately minimalist performance that makes the players appear like robots), or the band *Death Grips* (whose performances are said to contain little material from their extensive releases)

playback suggests)? These questions may sound familiar to people who often transfer music between studio and stage.

Three nonchalant answers:

- Liveness increases the audience's investment
- Liveness obeys and informs the environment (see Ingold's 'dwelling')
- Music-playing is (still) an enjoyable activity

3.3. Mimesis

In the second chapter *Around the Instrument*, we touched on the acoustomotoric unit and a phenomenon that I describe as an 'autopoiesis of music-playing': Together, the necessity of movement *for* sound and sound as a direct consequence *of* movement form a self-stabilising system. This autopoiesis also functions in non-performative formats like film, and stabilises a live performance even in cases where music-playing is mimed.

This route is taken by composer Trond Reinholdtsen's multipart opera project *Ø* (2015-20). With this series Reinholdtsen — although rooted in instrumental music culture — fully breaks away from the expectations and promises of instrumental mastery. The performers of the series speak and sing playback files of the composer's processed voice. Via the separation of pre-production and playback, *Ø* (2015-20) takes advantage of the possibilities of the music studio, but also gains more independence for immersive stage designs and exaggerated performance of the 'musicians', which in fact are puppeteers (figure 3-5).[54] The unprecise synchronisation in instrumental and voice playback is part of the style. The coarse gestures of the performers almost show the lowest possible degree of synchronisation, that nevertheless sets out the effects of the 'performative autopoiesis'. The fiction of music-playing stabilises both the music and the performance. We learn from this that even in highly mediatised realms the mechanism of the acoustomotoric unit still functions.



Figure 3-5: Stills from Trond Reinhodsens' *Ø episode 7* (2016)

[54] Link to video: https://www.youtube.com/watch?v=U4bUxCCqWzE

While Ø is fully transparent with the miming that takes place, in other pieces, the degree of transparency is more refined and varied, as applied in genres of humour or horror. In the gloomy (music) theatre works of Susanne Kennedy, miming plays an important role. In her works usually the texts are completely reproduced from tape while the performers mime the voice roles (controlled via in-ear monitoring) through their movements. The (de-)synchronisation is balanced at the sweet spot between realistic and artificial that is explained in the concept of the 'uncanny valley', effecting discomfort and horror. In the performative installation *Orfeo – eine Sterbeübung* (2015)[55], a singer and a string quartet play live music, but wearing face masks, adopting doll-like postures, as well as the immersive stage setting bring a deliberate disconnect to their music-playing.[56]

Similar to liveness, the acceptance and expectation of mimesis often is clarified within the context.[57] In several performances the artist Sarah Hugentobler investigates the technique of 'lip sync' with a sophisticated approach.[58] In *Floating Knights* (2024) samples of three male voices and three instruments get 'lip and body synced'. With the sound coming from a small loudspeaker draped around Hugentobler's neck and her extremely precise and convincing synchronisation, Hugentobler's performance manages to fully affirm the playback's emphasis, while never exaggerating it (figure 3-6). The comedy is induced by the 'gender switch' wherein the female performer comments on male attitudes by becoming their performative medium. All of Hugentobler's lip sync performances include samples of virtuouso instrumental recordings. Paradoxically, the precise re-enactment of the visual music-playing seems to sharpen the ears for the more 'pretentious amounts' in the virtuosic instrumentality.



Figure 3-6: Still from Sarah Hugentobler's *Floating Knights* (2024), miming a violinist.

[55] A collaboration of Kennedy with Suzan Boogaerdt, Bianca van der Schoot, and *Solistenensemble Kaleidoskop*.

[56] This describes the tendency for highly abstract, completely artificial characters to sometimes be better accepted than characters that are designed to be particularly human-like.

[57] For instance, in the *Eurovision Song Contest (ESC)*, it is clearly regulated that the vocals are sung live, while the instruments come from a playback track.

[58] Link to video: https://www.sarahhugentobler.ch/performance.html

In the context of music performances, miming often simulates instrumental play. Yet, miming is not bound to phenomena of cause and effect: An example: In his dance performance *Sacre du Printemps* (2007), dancer and choreographer Xavier Le Roy mimes a conductor.[59] His choreography interprets Stravinsky's music — played from tape — with a movement repertoire that is precisely synchronised to the music.[60] His movements directed towards the audience illustrate the music and draw the audience's attention to certain aspects of the music. Le Roy thereby reverses the temporality of traditional conducting, giving listening instructions to an audience instead of playing instructions to an orchestra. On a fictional level, the orchestra endures in the role of the audience, which is addressed by the conductor — underscored by the fact that the loudspeakers are under the audience's seating. As in *The Reply* (2016), looking into the audience's eyes is not simply a break-down in the 'fourth wall' that indicates co-presence, but also sets out a fiction that entails the music-playing.

Coming back to the starting point of this chapter, we could ask what miming is in the case of DMIs. One of the few contributions in the field of digital instrument design that has attempted an approach of miming is a research team including composer Alon Ilsar and their development of a piece for their DMI *AirSticks*. The team focused on the evaluation of the spectators, since they describe the audience 'as stakeholders in the design of these instruments' (Ilsar, Hughes & Johnston, 2020, p. 315). What they propose is to take advantage of this freedom of choice via a 'sound-first approach'. This means that they first created a track of music and then looked for possible body movements that would simulate music-playing.[61] Miming the functionality of the interface fooled their test audience: 'Though completely mimed, this performance looks like an instrument is being played' (Ilsar, Hughes & Johnston, 2020, p. 317). In the case of the development of *AirSticks*, the team did not stop at this point as their goal was still to 'implant these mimed gestures into the actual workings of the instrument' (Ilsar, Hughes & Johnston, 2020, p. 319). Obviously, the mimetic way of working did not come into question as the end result of a musical performance. This confirms the general tendency of following a skeuomorphism design that emulates traditional instruments, but also again points out the 'curse of the choreographability'. The development of the *AirSticks* illustrates the paradoxical navigation between affirmation and transcendence of a 'classic instrument'. A surprising off-ramp from this loop is to actually make the DMI more a means to an end; to overcome the idea that a sensor is already an idea for a piece. This is reflected in a statement by Perry Cook who proposes to 'make a piece, not an instrument or controller' (Cook, 2001, p.1). Precisely by retreating into the background, a design that allows sounds, movements and fictions to come to the fore gains a 'state of instrumentality'.

[59] see subchapter 2.5. *Complementary Actions and Conduct*

[60] Link to video: https://www.youtube.com/watch?v=88BSUFyvUVU

[61] This 'sound-first' approach is quite similar to the typical procedure in my practice, where a music track is already in an advanced state before it is integrated into a specific, performative setting. In using the terms of 'miming', the team does not only take notice of the fact, that from an audience's perspective, it is often indistinguishable if or how the instruments actually works or not: with its use, it valorises the simulation of instrumentality and identifies it as a legitimate attempt to write an 'audio-visual contract' (Chion, 1994).

3.4. What Comedy Knows

If a dis-connection between performativity and sound becomes the centre of attention, it is often either because the setting is experimental or because the situation benefits from its unreliability. This often happens in comedy, where a misfit or imbalance sets up the tension that enables humour. A lot of comedy takes the ritualisation of music performances as a basis for creating deviations.[62] Since comedy requires conscious comprehension, its content must not be too abstract. The audience must be taken by the hand and guided, all the more so because comedy works with unreliability. Therefore its dramaturgy constantly has to maintain a balance between guidance and surprise, allowing complex games with music-playing.

Countless sketches work with the figure of the conductor. Perhaps the function of the conductor seems predestined for jokes, as it is at the same time highly conventional, expressive and not least a bit enigmatic for many people. Many sketches show the conductor as a figure who does not control the orchestra, but on the contrary, where the music controls the conducting figure. In Rowan Atkinson's conductor sketch from 1981[63], a recording of Beethoven's Symphony No. 5 allows the performer to investigate the relation of sound and movement via various constellations. It is a good example of how these different relations are clarified within the performance. In the following moments, I perceive essential clarifications within the performance:

- 0:00 The lack of the orchestra (but tuning sounds) = The fictional setting becomes clarified
- 0:25 The baton is in the conductor's hair, he's looking for it = The conductor's character is an unserious conductor
- 0:34 The conductor is 'silencing' the orchestra = The fiction is given value
- 0:39 The first bars of the music are in sync with conducting movements. The fiction is stable, the conductor leads the orchestra, but the *residual movements* are so obvious that the conduction becomes exaggerated
- 1:15 Desync while the tape surpasses the character. Within the fiction, the orchestra starts to play autonomously.
- 1:25 The performer adapts to the recording's tempo. The conductor is now pretending as if he would still conduct the orchestra, although he loses track of it — in the logic of the fiction.

After these steps the character of the conductor executes movement patterns drawn from other activities: the gesticulation of a traffic policeman or golf swings. These remain very close to the music's 'rhetorical energy'. Thereby the comedy emerges from the unexpected kinship of the music and these activities.

In relation to our questions of musical performance, it is therefore interesting to see how effects of *audio-vision*, *liveness* and *mimesis* become exploited without claim to stylistic coherence as long as

[62] But it is not only the framework around the performance that is addressed. The fact that many comedians are excellent (multi-)instrumentalists allows them to play a game of *residual movements*.

[63] Link to video: https://www.youtube.com/watch?v=BgOTI5kTcB8

the comedy is able to transport its communication design beyond the individual joke. All of this takes place without any changes in the simple general stage setup of a playback track and a performer. The initiating fiction of a live orchestra remains intact throughout the whole sketch, whereas desynchronisations in narration and on a sensory level produce what Chion would call *dissonant harmony* in the 'audio-visual contract' (Chion, 1994, p. 37).

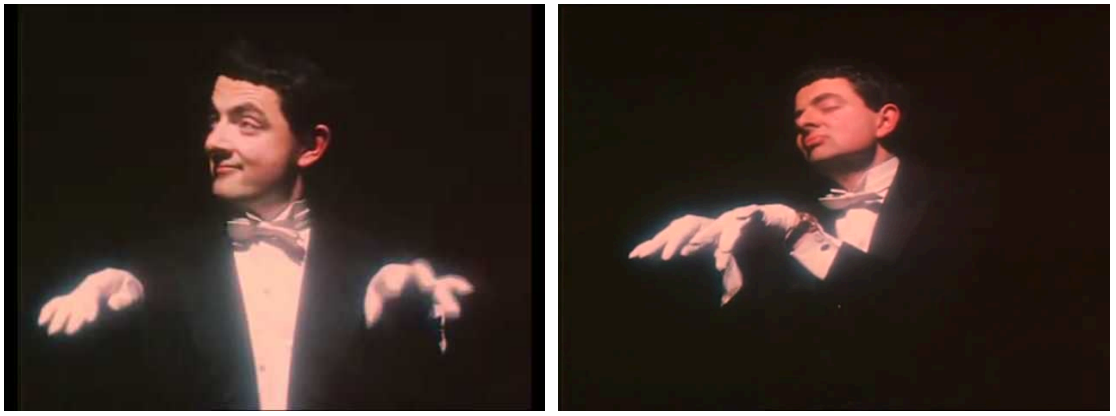


Figure 3-7: Stills of Rowan Atkinson sketch miming a pianist

In his similar pianist sketch, Atkinson mimes the performance of Beethoven's 'Moonlight Sonata', on an invisible piano (figure 3-7).[64] Here, too, a freedom of movement decoupled from the causal logic of sound generation culminates in a recoupling with *complementary actions*. Even if the sketch certainly does not seek to be a musical interpretation of Beethoven, the sketch is a unique interpretation of the 'Moonlight Sonata' that succeeds in laying out certain aspects of the music. With the alternation of facial expressions, the 'pianist' illustrates and ironises the schematic changes of Beethoven's patterns of 'thesis and antithesis'. With a short glance at his (invisible) wristwatch, he indicates the lengthiness of a passage. Similarly, like in the conductor sketch, the comedy works in the unsuspected change of agency. Is it the music that controls the pianist's hands or the conductor's movements? These two examples illustrate how a multitude of constantly changing, different relations of body and music (re-)produce and stabilise music-playing in totally fictional realms. It is noticeable that it hardly matters if the fictionality is setting up an instrumentality with the logic of production (pianist) or without it (conductor), while both sketches use identical principals. In many sketches from standup comedy I see a knowledge of how the (de-)construction of music-playing is communicated within the performance — sometimes this (de-)construction even *is* the sketch. Such knowledge I find applied in composer Mark Applebaum's piece *Aphasia* (2009)[65], in which recorded sounds are combined with torso movements of a sitting performer. Whilst the sounds and movements largely mimic each other — establishing a basic phenomenological reliability —, the piece lives off small deviations and well-timed surprises, and inspired my composition of *The Fountain* (2023).

[64] Link to video: https://www.youtube.com/watch?v=7v5BCX6bkLQ

[65] Link to video: https://www.youtube.com/watch?v=wWt1qh67EnA

3.5. Fictions and Games

There are many pieces that combine functionality and theatricality in music-playing. Often, narrative elements embed this blending. In Natacha Diels' *Beautiful Trouble* series (2019-2024) — created in close collaboration with the string ensemble *JACK quartet* — fictions accompany and inform the music-playing and vice versa. Next to a six-part video series, a scenic concert version exists. The work embraces the poetry of the everyday in a highly playful, poetic way with a melancholic (and sometimes ironic) undertone. Via green screen technology, the ensemble appears in sceneries of restaurants, clouds, ballrooms, at barbecues or in abstract spaces (figure 3-8).[66] Everyday gestures as well as exaggerated residual movements from string playing are composed into the score.



Figure 3-8: Still Episode 1 of Natacha Diels' *Beautiful Trouble* series (2019-2024)

Throughout all theatrical embeddings, the quartet retains the shape of a fully functional ensemble. However, narrative contexts still have a huge effect on the musicians' roles: They become a mixture of dummies, commentators and mediators of the fiction. Music-playing here is also a metaphor for togetherness, coexistence and human activity and condition in general. The ensemble acquires these fictional aspects just *because* it preserves the formality of the string ensemble. The instrumentalists – especially in the video version – sometimes look like puppets with which 'life plays'. But also, they are the guarantors who keep the 'soundtrack of life' going – instrumentally and symbolically.[67] Thereby the quartet is both: the motor that provides the 'soundtrack' *for* the fiction and protagonists that

[66] Link to video: https://vimeo.com/553195857

[67] In this respect, the video format is a reversal of Chion's assertion that 'there is no image track and no soundtrack in the cinema, but a place of images, plus sounds' (Chion, 1994, p. 40). Here, a place of sounds is created, plus images.

receive value and depth *from* the fiction. On a spectrum between theatricality and functionality, I would place this work closer to the latter.[68]

Towards the other direction I locate the work of composer-performer Una Lee. In her sound performances, Lee takes on various and overlapping performative agencies like presenter, narrator, character, musician or executing performer. In her works, the art of storytelling features a 'container' for sounds, voices, gestures, costumes and stage sets. In collages of live and playback voices, Lee unfolds stories that address memory, intimacy and (re-)imagination.



Figure 3-9: Photo of Una Lee's solo performance *Muamua* (2014)

In *Muamua* (2014), Lee speaks and sings along a playback track, wearing a white evening dress (figure 3-9). While fiddling with a mobile phone, Lee's speaking and singing occasionally 'snaps' into place perfectly with the playback. The auditory 'track' acts as the storytelling space which Lee re-locates on stage with her work-specific stage persona. Composing interacting layers of 'sound-space' and 'stage-space' often the body and (playback) voice undergo a 'counterpoint' in Lee's works. It is not only the composer-performer approach that sets the work's personal and intimate tone, but an almost incidental music-playing without any attitude of musicianship, only supporting the work-specific materials, textures and formal structures. Thereby Lee informs her sound-based storytelling through compositional means.

A kind of music-playing without narrative elements that nevertheless establishes its own unique dramaturgy can be found in Marko Ciciliani's 'gamified audio-visual performances'. Here, the setting and course of the performance are created via game design: In his work *Kilgore* (2017/18)[69] instruments act as game controllers in which two musicians or 'players' navigate the specific rules,

[68] This positioning is also reflected in the costumes in a nutshell: the uniform black shirts could almost pass as classic concert attire, but the trousers and shirts are a little too casual, and the white sneakers confirm this subtle shift towards a (theatrical) costume.

[69] Link to video: https://vimeo.com/250603699

goals and motivations of a game (figure 3-10). Visuals and sounds become the players' virtual orientation and feedback system. This game aspect enforces a music-playing that completely differs from most music performances: The fact that the two players in *Kilgore* (2017/18) are set up as competitors produces a unique dramaturgy and agency of the (music-)playing. While game controllers and thematics have inspired several music pieces[70], in Ciciliani's 'ludified pieces' music-playing becomes the mediator between performer and game engine.

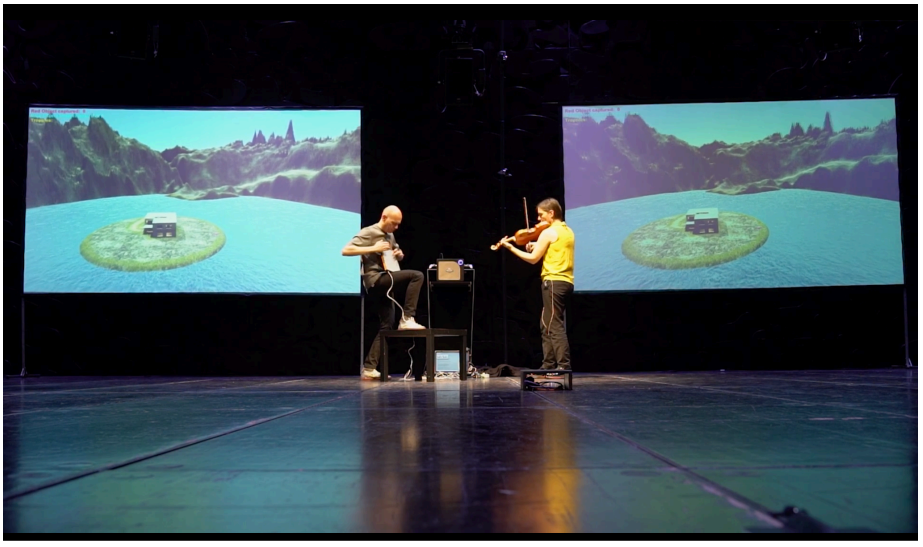


Figure 3-10: Marko Ciciliani and Barbara Lüneburg performing *Kilgore* (2017/18) with violin and gamepad

Looking at these examples underlines the autopoiesis of music-playing that acts as a 'dramaturgical package' of specific rules, patterns and associations. This package, in turn, can be easily transferred and embedded in other contexts, such as narrative ones (Diels). In order to 'untie this package', a big step must be taken: This either breaks away from superficial markers such as virtuosity, scores or instruments (Lee) or establishes a completely new 'agency of music-playing' (Ciciliani).

3.6. Sonic Reading

After the epistemological loop of mediality and liveness, and equipped with many examples from various formants, music-playing appears to be the ideal playground for directors and dramaturgists. In order to supplement this excursion, we could come back to the performer's condition on stage and ask the rather logistical question: what is to be done on stage? From this situative angle, there is little pondering about *live* or *non-live*, rather a sense for what is already there and what is to come. We already examined the case of how a sound playback is 'relocated' by performative actions in chapter 1. *Around the Studio*. Beyond this 'playback scenario' we must ask more generally: what are the

[70] For instance Stefan Prins' works *Piano Hero* (2011) and *Generation Kill* (2012).

manifestations of sound that might already be on stage? In his book *Sonic Writing* (2019) Thor Magnusson shows how a process of externalisation takes place through different forms of writing - analogue and digital, alpha-numeric and graphic, illustrative and modelling. He understands writing processes not only as symbolic coding (writing scores), but also as inscriptions in materials or the programming of machines: knowledge about acoustics is inscribed in instruments, notes written on paper as instructions, waves carved into records as information about sound, or even algorithms that produce sound. These 'written goods' are those that might already be on stage. I suggest — in relation to Magnusson's notion — to consider *sonic reading* or sonic *re-writing* as performer-orientated substitute for liveness, describing the various human and non-human activities that execute the deciphering of sonic inscriptions. Reading out the symbols of a score is a common interpreter's task. A music performance that works with spatial resonance reads the material manifestation out of the architecture, whereas a loudspeaker reads out mechanical written signal inscriptions or digital code. A music performance that involves improvisation or *wayfinding* (Ingold, 2000) in a dynamic environment requires the performer to 'read the room'.

3.7. Summary

Exploring different formats portrays music-playing as a course of animation. While using digital musical interfaces (DMIs), music-playing becomes a choreographic affair. This draws attention to how these interfaces communicate their (experimental) design. Here, the acoustomotoric unit is just one of many design options. While a design of skeuomorphism is often used to emulate an 'analogue instrumentality' for DMIs, a systematisation of Steve Benford proposes the four tendencies expressive, secretive, suspenseful and magical. After this excursion on digital interfaces, a juxtaposition takes place of 'cinematic music-playing' and an emphasis of liveness. Music performances today are often highly mediated realms in terms of what is played live, and *what is the goal* of this liveness becomes a matter of design. Guiding, fooling and focussing the audience's attention enables various degrees of (dis-)embodiment on stage. A closer look into these terms shows the deep interdependence of mediatisation and liveness.

Throughout the transferences and simulations of different formats, the acoustomotoric unit not only stays intact and enacts a stabilising autopoiesis, but it also — in its violation — offers effects of liveness, humour, horror and storytelling. While popular formats mostly configure how liveness and mimesis are evaluated, the field of experimental contemporary music must consider a conscious and work-immanent design in order to communicate the music-playing. An inspiration for this can be derived from various comedy sketches that include music-playing. In such an active 'communication design', fictions suggest and produce specific evaluations and can emphasise variable artistic goals, while negotiating body and sound.

After examining numerous examples and the urge to overcome the double-bind dynamic of liveness and medialisation leads to a notion of *sonic reading*. This notion is inspired by Thor Magnussson's term *sonic writing,* which describes forms of music manifestations via various writing processes. My derivation from Magnusson seeks a pragmatic and performer-orientated definition of 'what (still) happens on stage'.

4. Around the Musician

> [...] 'The intangibility of the digital environments highlights – perhaps even paradoxically – the relationship between sound and body and the broader material qualities of the world' (Rautiainen-Keskustalo, 2021, p. 152).

A musical performance, like any artistic space, is framed by boundaries that mark the transition from the ordinary to the specific. In musical performances, a key marker of this transition is the appearance and co-presence of (a) musician(s). Looking for performativity *around the musician* does not ignore or abolish the (human) musician but touches on sonic agency in the musician's surroundings. Shifting gradually away from the musician, I seek (inter)actions with and of other 'entities' on stage, circling around the following four tracks in this chapter:

- The space co-performs
- The (eco-)system co-performs
- The 'things' co-perform
- Sound 'it-self' performs

Two music theatre works from my portfolio are central to this chapter. While the music theatre work *All Watched Over by Machines of Loving Grace* (2021) is an investigation of ecosystems, the focus in the music theatre work *Mixed Feelings* (2021) is on 'material agency'.

4.1. Resonance as Actor

If there is something other than the human musician that (co-)performs, it most likely to be something non-human that 'acts' or 'interacts'. In the first foray, one could declare everything that is outside of the 'manual zone' of the performer and the performer's instruments as the 'environment'. This separation may seem a little simplistic, but it is likely the *a-priori* assumption of a witnessing audience, as the work-immanent interactions might only become apparent over the course of the specific performance. Composer and researcher Simon Waters suggests the notion of a 'performance ecosystem' as a bracket for these interactions, while the terms of performer, instrument, and environment 'reify the corporeality (bodilyness) of the first, the goal-orientedness of the second, the otherness of the third' (Waters, 2007, p. 2). Together the three build an *ecosystem*, which is, by definition, a complex dynamic system.

Addressing this 'otherness' of the environment, spatial resonance might be the foremost 'sonic actor' we can identify. In any music performance context (with the exception of headphone use) the resonating body of the room is always present. By addressing a room's specific acoustic conditions

and characteristics, it becomes a co-performer. The Venetian polychoral style, composed for the actual acoustic conditions of the church San Marco in Venice, and also Dufay's *Nuper rosarum flores* — composed with numeric analogies to the architecture of the Florence Cathedral — take this 'site-responsive' impact to the extreme (Warren, 1973). Like the concept of liveness, the concept of site-specificity only makes sense where site-*un*specific music is a reality. Media reproduction and standardisation again first suppressed resonance as co-performer and then allowed it to be rediscovered in new experimental forms, iconically exemplified in Alvin Lucier's *I am sitting in a room* (1969) where the reverb of the space takes over the 'sonic action' after the composer-performer records a short sample of speech and plays it over and over into the space, adding up its sound spatial characteristics. Resonance has been investigated as an actor in such famous compositions like Steve Reich's *Pendulum Music* (1968) until today, e.g. in the sound performances of Lara Stanic which often involve complex feedback systems.[71]

If and to what extent the acoustic characteristics become an actor in a performance ecosystem is partly regulated by its stylistic and socio-cultural context. A rediscovery of the environment as a sonic actor can also be observed in classical music, where the venues receive enhanced attention or even become the main attraction.[72] In the corresponding concert halls[73], the orchestra is barely the sole 'sonic actor', but rather a provider of impulses which decode the hall's 'material inscription' (Magnusson, 2019). Listening to such 'superior' room-acoustics of concert halls, the audience undertakes an (imaginary) comparison in which the architecture co-performs with the musicians.

4.2. Preparing an Ecosystem

Waters describes the relations that unfold and formulate within the triangle of performer, instrument and environment as 'software'. A school of thought that enables a deeper access to this 'software' between performers, instruments and environment is *Actor-Network-Theory*[74], significantly developed by Bruno Latour (2017) and following thinkers like Lambros Malafouris (2016). In ANT's terminology, people, devices, cables, objects, weather and bacteria form networks as actors. Instead of describing musical performances as interactions between subjects (e.g. drummers, spectators) and objects (e.g. the Euclidean space, instruments), this school of thought asks what 'capacities' and what alterations does a specific network provide in order to 'emphasize that *moment of ongoing plasticity and incompleteness*' (Malafouris, 2016, p. 295). The actors are not autonomous but each participant acts as a mediator. Thereby the logical signal chain is overcome via describing all the involved actors and their connectedness as an ecosystem, blurring the boundaries between musicians, instruments

[71] An example is her performance *spielfeld feedback* (2005). Link to video: https://vimeo.com/557796984

[72] e.g. the music festivals, *Zeiträume Basel, Musikinstallationen Nürnberg, Festival Rümlingen*, concert series *Music for Hotel Bars*

[73] e.g. Elbphilharmonie Hamburg

[74] shortened *ANT* from here on

and devices, identifying their *agency* within a network that itself is unstable. Enabling this capacity, it becomes possible to seek variation within the three categories.



Figure 4-1: Still of stage set and performers in *All Watched Over by Machines of Loving Grace* (2021)

In the music theatre work *All Watched Over by Machines of Loving Grace* (2021)[75], the vision of an ecosystem stood at the beginning of the conceptualisation. The piece was co-created by composer Lukas Huber (vocal compositions), stage and costume designer Zahava Rodrigo, director Benjamin van Bebber and myself (electronic composition & setting). Named after the well-known poem by Richard Brautigan, the piece features a choir and a stage setting full of microphones and loudspeakers, quoting spaces between a control room, laboratory, indoor landscape and home studio. Reviving early cybernetic dreams, where people 'are free from labors' and 'live together in mutually / programming harmony' (Brautigan, 1967), our team tried to address some very optimistic visions of today's 'machine learning wave'. Based on the conception of Waters, these are the elements that were part of our ecosystem:

- Performers:
  12 singers with various ages, music skills & stylistic background
- Instruments:
  Various microphones, loudspeakers and moving sensors within the stage design
- Environment:
  The stage design in a theatre venue

The stage consisted of bright fabrics that formed a smooth and cosy 'landscape', including three caves or tents (figure 4-1). Loudspeakers of different sizes, shapes and positions were spread out between the sheets. Three consumer 'boomboxes' were hidden in foam sculptures scattered around the room, and a fourth was visible. One of these four speakers was powered by a wireless connection, while the other three were wired and stationary. A fifth, repurposed garden speaker hung above the heads of

[75] Link to video: https://vimeo.com/680364429

visitors. Four other speakers were mounted as high as possible and out of sight in the corners of the ceiling, creating a non-symmetric and unsystematic display of loudspeakers. Having some small loudspeakers amidst the audience and some hidden on the ceiling allowed us to evoke different projections of the loudspeaker's virtual space, staging them as sound sources, frames or letting them become transparent.[76]

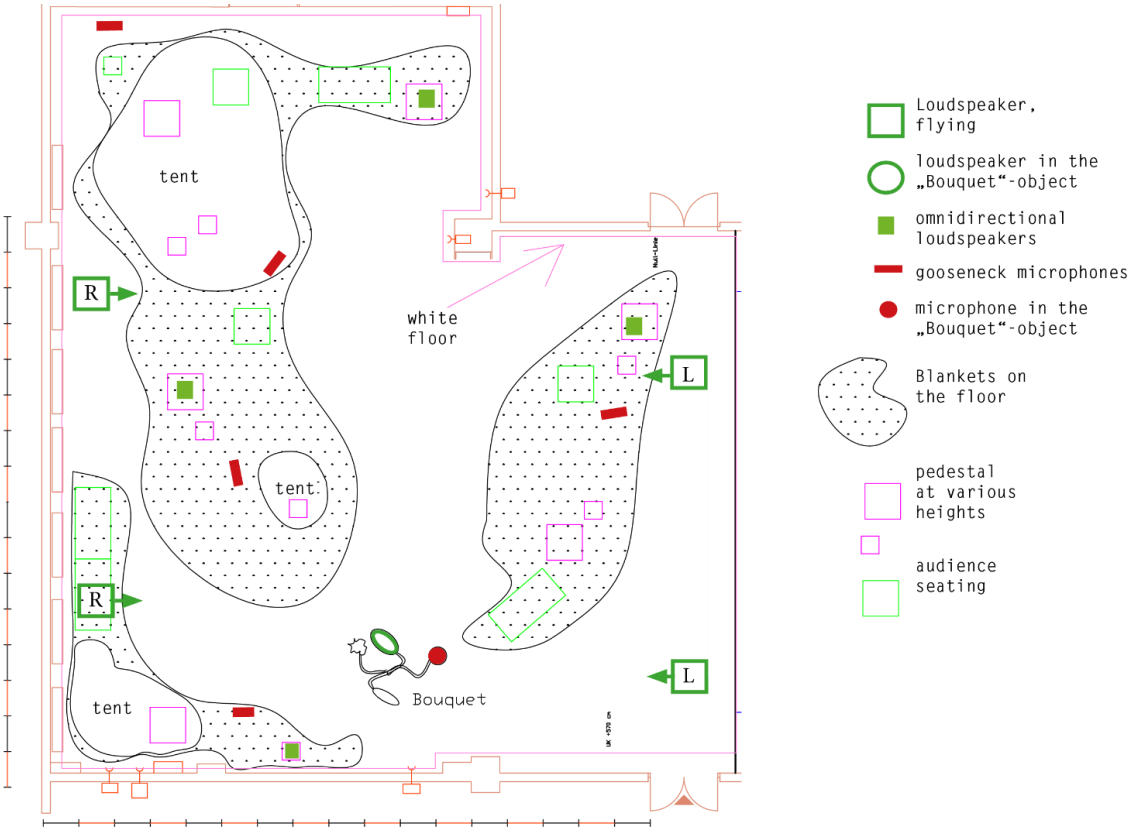


Figure 4-2: Stage sketch of *All Watched Over by Machines of Loving Grace* (2021)

In this landscape were about 15 microphones mounted on metal goosenecks, spread all over the room. In groups of four to seven they formed 'bouquets' that stuck out of the fabrics. One of these bouquets rotated around its own axis. Another microphone hung from the ceiling as part of a larger element ('bouquet'). The unconventional setting of the microphones not only visually created an ambience in which audio devices became part of the scenery. The use of microphones in live settings is usually mono-directional: one point from the stage is mixed for the audience. Although a mix in this standardised scenario is supposed to be the same for everyone, it has a 'sweet spot' that gradually diminishes outwards. Amplified voices are essentially projected as equally as possible toward the audience. The setting in *All Watched Over by Machines of Loving Grace* (2021) abolished this reference point, and rather sought to interconnect unique different listening and sound spaces. The stage set with its three tents created separated, intimate spaces, which could be acoustically bridged by a corresponding routing. The heights and positions of the devices enforced unusual ways of speaking and singing. Lying under the membranes or crouching over them, the choristers directed the focus more to the relationship with the microphone or to one's own location within the

[76] See also subchapter 1.5 *Re-localisations on Stage*

landscape than to the result to be produced. The voices were shaped by their bodies' postures. The non-conventional use and positioning of the microphones activated the body's potentiality and added unexpected effects of intimacy and distance.

The same 'capacity' is what we wished to implement in the performers' cast. Our *Extremely Mixed Choir*[77] brought together an intergenerational, multi-professional and multi-ethnic group whose individual abilities were reflected in the compositional and rehearsal process. Nevertheless, a major attempt was made to install the choir as a passive entity in many scenes, reducing their activities. All together, the choir, the microphones and the loudspeakers were designed as a biotope that could enable the software of the ecosystem.

4.3. Acting Microphones

Soon after the rehearsals began for *All Watched Over by Machines of Loving Grace* (2021) — somewhat reflecting the title of the work — the question of the 'outside' arose; both in relation to the 'outside team' of composers, director and set designer, and in relation to the visitors. To what extent should the four of us remain an entity which 'watched all over'? Should the choristers be able to intervene more in the ecosystem of sound with knobs or live coding? To what extent did the habitat of the stage space again form a hermetic black box — especially for the visitors, for whom the immersive setting and the events in it could appear enigmatic? Can we design an ecosystem without being part of it?

In order to 'use the software', the status of actors, instruments and environment must change: For instance, a microphone must become an actor. Sound Artist and researcher Mark Peter Wright deduces how a microphone can be described as an actor as follows:

> [...] I would argue that the microphonic actor is not autonomous in and of itself, nor is it an impartial tool of servitude. It is a distortion mediator that performs agency in active relation to others, and it is contained within a web of cause and effect, human and nonhuman, material and immaterial performativity. The importance of ANT for any microphone, then, is that it makes clear that the emphasis resides on relations and effects. (Wright, 2016, p. 61)

In the opening of my piece *Bias Dialogs* (2019) I am singing and speaking into a gooseneck microphone. For this scene, I designed an ever-changing 'web of cause and effect' (Mark Peter Wright, p. 61), letting the microphone perform several effects simultaneously, creating a multitude of effects that derive from the microphone-performer relationship. The signal of the microphone processes several functions simultaneously. Alongside the common processing of amplification and recording, it also acts as a sensor. Certain parameters of the signal cause further live processing, re-sampling the recorded voice and other sound files. Additionally, a movement sensor on my wrist is

[77] With this choir we worked already for another music theatre production called *Abhängigkeitserklärung* (2018) English: 'Declaration of Dependence', translation LH.

connected with the same live-electronic processing, doubling the input access on the possible output results. The whole set of programmed connections change through time as their parameters are automated. Furthermore, an inherent amount of randomisation characterises the programming. At this state of complexity, a state of control is no longer possible for the performer, because in the various routes of access to the microphone the effects resist a controlled handling. The agency of the two actors (microphone and performer) becomes equalised. The simultaneity of several levels of relationship evokes an interactive ecosystem around the musician. Such a loss of access sets up a new kind of relationship, in which objects activate the performer. Composer-Performer Marko Ciciliani describes this agency shift in a no-input mixer, whose chaotic and complex behavior shifts the agency from the performer to the instrument:

> In situations like this, performers find themselves partly in a reactive role, as they constantly have to adapt to the instrument's behavior. This gives rise to a situation somewhat like a dialog between the instrument and the performer, in which the former possesses at least as much agency as the latter. (Ciciliani, 2021, p. 31)

In another scene of *Bias Dialogs* (2019), a microphone acts as a trigger for a voice sample that screams a high-pitched '*Hey!*', as I knock harshly on the membrane.[78] In addition to the triggered voice, the microphone's signal is amplified with much reverb. In contrast to the *doubled-input* in the opening scene, here is a constellation of a *double-output*. The knocking sound gradually gets split into two phenomena with very different spatialities: resulting in an amplification of the knocking, and in a digitally triggered scream ('*Hey!*'). In the further course of the work, volume of the scream decreases via an automation in the sequencer, until it is completely faded out. This carefully evolving branching (the 'double-output'), as well as the fade-out favour of a peer-to-peer network of ever-changing relations.

Signal chains are a useful means to describe phenomena of cause and effect, but their disadvantage is the need to set a starting and ending point, which undermines the ongoing feedback circles and the potentiality of every performance moment. Overcoming the logic of the signal chain characterises ANT as 'keeping it open-ended is essential to the actor-network project' (Bates, 2019, p. 43). I often use such 'peer-to-peer designs' in my work to overcome instrumental control. Increased complexity arises from the combination of double-input and double-output, e.g. in the works *kaktus firmus* (2020) and *The Fountain* (2023), where voice and movement control the same parameters in a processing that again generates parallel effects. In the second act of *Ritournelle* (2019) and with the crystal object in *Mixed Feelings* (2021), I use a variation of a no-input mixer. A small number of rotary knobs each control different parameters of several sound files simultaneously (volume, pitch, speed, EQ frequencies). The respective allocation of knob and parameters changes constantly. This requires attentive, curious playing, in which the player explores both the sound *and* the programming.[79]

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[78] Link to scene: https://vimeo.com/381926649?autoplay=1#t=5m10s

[79] The player's lack of knowledge about the interface's programming often leads to non-linear emphasis between input activity and sound results: For instance, the sound remains static, even though a lot of manipulation is taking place. According to Steve Benford's systematisation, this would be a 'suspenseful design' (Benford, 2010). See subchapter 3.1. Communication Design.

While ANT allows one to analyse the depth of the hidden relations, it might be rather unintuitive for an audience, which presumably follows a more phenomenological take, as was unfolded in the previous chapters. In the audience's perception, the principles of Gestalt theory track down the most dominant relations — putting performer, instrument and environment into drawers and changing their status only if necessary. From this phenomenological perspective one could ask ANT: Does the microphone only appear to be active, because our imagination addresses it as a placeholder for ongoing but invisible calculations in the computer? While ANT clearly is not interested in this phenomenological differentiation, it is plausible to presume that we use this placeholder mechanism all the time. For instance, in the case of the human voice, we spontaneously summarise the speaker, their voice and the sound of their voice as something identical. The objection that the microphone does not trigger or feed the sound 'itself' only leads us back to the reduced view of a signal chain. In this way, the microphone's physical presence, characteristics and embedding do act out performativity.

In the music theatre work *All Watched Over by Machines of Loving Grace* (2021) it was my aim to play out the full capacities that a common network of microphones, loudspeakers and performers provides, a potential that is, however, rarely realised to the full. One scene might exemplify the simultaneity of complex relations of the ecosystem while its actors remain in a playful manner: In the scene where Brautigan's titular poem is recited, an ongoing exchange of properties and materials takes place.[80] Standing at the large 'bouquet'-microphone, the performer Alexandra Idele sings the three verses, while the audio signal of her voice is not only projected into space, but also recorded and sampled. Next to them, three performers play with a turquoise foam cylinder containing a motion sensor, loudspeaker and audio receiver. The sound synthesis triggered by the cylinder's movements is based on a constantly updating audio sample that shifts the voice into a completely different narrative and kinetic context. Thereby the making, supplementing and mediation of the sonic materials are brought into ever new constellations: each actant takes on a different but changing view on what is instrumental or environmental.

4.4. Adapting to the Machines

In the course of mechanisation and digitalisation, we observe developments that call into question what the subjects of a musical performance are in the first place. Machines move the bodies of the 'Pendulum Choir' from duo *Cod.Act* with hydraulic drives[81]; an orchestra adapts to the machine's timing in *gamut inc's* music theatre *Zeroth Law* (2023)[82]; while in Heiner Goebbels' *Stifters Dinge* (2012)[83] some barely visible technicians supervise an autonomous stage set of five mechanised

[80] Link to scene: https://vimeo.com/680364429?autoplay=1#t=19m32s

[81] Link to video: https://vimeo.com/420235953?msockid=0479416b09b111f1b6979a5cd91b43df

[82] Link to documentation: https://gamutinc.org/zeroth-law

[83] Link to video: https://vimeo.com/134605443

pianos. With ‘virtual musicians’ in the form of neuronal networks, synthetic voices (‘Vocaloids’) or use of ‘Artificial Intelligence’, music-playing shifts almost allegorically to non-human actors. Since an AI on stage is still not a matter of course in experimental music in 2025 (and probably would be addressed in the programme text), the adaptation on behalf of the musician is just as meaningful as the exploration of the technological processes. Many music performances in these realms involve voice as a sonic and semantic material (Jennifer Walshe, Holly Herndon), pointing at questions of identity, power, while at the same time providing a comprehensive shape: a ‘humanised voice’.



Figure 4-3: Stills of Steffi Weismann’s *Backdoor Roomies* (2020)

A composer who has been working with speech recognition before the recent ‘wave’ of chatbots and AIs is Steffi Weismann. In her performance *Backdoor Roomies* (2020), Weismann talks to her ‘long-time digital coach’ *Victoria*.[84] While the phenomenon of voice anyway resists the subject-object dualism (see subchapter 2.4. *Residual Movements*), the conversation with machines introduces new turbulence. Is it the performer’s voice that controls the machine or is it more the speech recognition that ‘drills’ the performer to articulate as clearly as possible? Artist Len Pappe investigates this power structure within an ‘performativity in listening’:

> Any meaning in the field of intended communication can only be interpreted by the perceiver in relation to the perceived or its known context. Sound always communicates a relation between these two sides, and this relation can be unveiled as to its power structure when we analyse who listens and who listens back. (Pappe, 2014, p. 53)

As *Victoria’s* question becomes more and more inappropriate, Weismann’s character stops the (spoken) communication, stands up from the chair and moves into the performance space. As if she is withdrawing from the ‘linguistic sphere’, Weismann’s character encounters the performance space as a ‘parallel world’. Searching for sensualities apart from the machine’s ‘ears’, she encounters different materialities (foam, glass mirrors) by touching them and applying microphones (figure 4-2).

[84] Link to video: https://steffiweismann.de/current-fs-e.html

Weismann's character interrupted the conversation, but 'listens back', and in the further course, a performative suspense echoes now in the ears of the audience.

Further decreasing the actions of the musician, we find performers in a seemingly passive state (for the audience) — becoming part of the environment's material landscape. With performers 'doing nothing', the performativity of listening is the next aspect to encounter. In the choreographic sound performance *Only when it's on* (2018) by Tian Rotteveel two performers lie in the midst of a stage setting between a sound studio and a park.[85] While playbacks of sound and light produce contemplative to energetic atmospheres, the persistent passivity of the performers evokes elusive narrative associations. While red light and alarm-ish sounds liven up the stage, their bodies become placeholders for the audience's perception. The (non-)reactions toward the 'theatre machine' becomes a performative act of listening that might imply acceptance or resilience.

In the conception of *All Watched Over by Machines of Loving Grace* (2021) our quartet of artistic directors wanted the choir to undergo a similar state of latent passivity, relating to the poem's cybernetic vision 'where we are free from our labors' (Brautigan, 1967). Our dramaturgy suggested that the choir is initially freed from the compulsion of instrumentality — but rather creating performative feedbacks of the 'machines' labour'.[86] The vast use of multi-channel playback left the choir with little 'sonic labor' to do. This should have effected a shift of agency in the ecosystem triangle. Nevertheless, in the semiotic frame of a theatre work, 'doing nothing' proved to be a tough nut. Relying on the machine's autarkic energy and predictability, the agency of the choir was not doing nothing, but to remain open to what might happen instead. If they take action at all, then they should adopt a kind of *wayfinding* where they '"feel their way" through a world that is itself in motion, continually coming into being through the combined action of human and non-human agencies' (Ingold, 2000, p. 155). The originally planned passivity where bodies merge with the stage's scenery further developed into modes of listening. This takes place especially at the beginning and end of the piece in which the performers remain lying between the sheets while listening to long audio drama parts. The scheduled 'passive behaviour' enables rather alternative roles, qualities and relations among the choir. One corresponding scene in *All Watched Over by Machines of Loving Grace* (2021) sets up the variation of a 'game of telephone', reciting an excerpt from *In Watermelon Sugar* (1968) by Brautigan: Two performers improvise speaking, whispering and singing a text into two microphones.[87] Two other performers each listen to the microphone signal via an in-ear headphone and have the task of imitating what they hear as precisely as possible: Not only in volume, micro-timing, timbre, but also as simultaneously as possible. The pre-speakers were encouraged to always speak differently and surprise their post-speakers. Covering up the inevitable delay, the post-speaker has to 'sneak into the sound' of the pre-speaker. In doing so, the post-speaker should not be tempted by the anticipation of the sentence construction to intellectually supplement the sentence, but to remain in the perception entirely with the sound. The two pre-speakers are in

[85] Link to video: https://www.facebook.com/K3Hamburg/videos/1873677895997061

[86] More precisely, they had already done some 'preliminary work': they had made vocal recordings, which became the basis of the audio drama segments. This followed the idea that they had fed their voices into a system and now had nothing more to do.

[87] Link to scene: https://vimeo.com/680364429?autoplay=1#t=11m10s

this way required to listen to each other and to their imitators, their doublers, and thereby to provide for variance and to create variety. This mode forms a polyphonic web of feedback and variation that presents the voices in their materiality. For me, the resulting sound balances out all the aspects of our ecosystem triangle: It highlights individualities in the choir (the timbre of the pre-speakers), it activates the choristers as instruments (in the course of becoming 'fleshy amplifiers'), and it creates an environment (in the babbling and mumbling that effects a non-intentional sonic landscape).

4.5. Material Agency

Even if the musicians' agency shifts toward instrumental and environmental states, their bodies are still present. Can we move even further away from the music-playing body and describe the 'things' around it as autonomous actors? Addressing the sound-emitting things as the actors of music-playing, we need a concept of an 'active materiality'. This is advocated explicitly by the representatives of *New Materialism* (Jane Bennett, Karen Barad, Quentin Meillassoux) and in Andreas Weber's notion of 'Enlivenment'. These writers and thinkers are associated with modern phenomena like ecological crisis, Anthropocene and posthumanism, pointing out in their writings, that 'things'[88], objects, stuff, electricity, clouds have an agency of their own. They do not claim that everything is 'alive' in a literal sense, but that things have a capacity, a potential or a 'thing-power' as Jane Bennett puts it in her book *Vibrant Matter* (2010).

Introducing and addressing 'things' as the sonic actors, not as instruments, suggests non-manipulative encounters, but ultimately presents them as the main characters of the action. In the music theatre work *Mixed Feelings* (2021)[89], our team tried to establish sonic actors beyond the human musician. The artistic direction was carried out by director Benjamin van Bebber, stage and costume designer Filo Krause, and myself. The tricky bit in the realm of (music) theatre is to mediate the autonomous agency of things for an audience without appearing as an operator or administrator. Under the heading 'co-feeling-opera' (as we called it), we probed various strategies in order to draw attention to agency shifts in relation to the concepts of *New Materialism*. We choose the fictional setting of a beach to negotiate these aspects. All objects, performers and materials and even the audience were addressed as jetsam. This was influenced by a passage of *Vibrant matter* (2010) where Bennett describes how the scenery of jetsam became a crucial experience for her thinking and the notion of the 'assemblage':

[88] The term 'things' is often used in *New Materialism*. Therefore I use it in this subchapter, although it is rather imprecise.

[89] Link to video: https://vimeo.com/1106694030/331b88b962

> Glove, pollen, rat, cap, stick. As I encountered these items, they shimmied back and forth between debris and thing – between, on the one hand, stuff to ignore, except insofar as it betokened human activity (the workman's efforts, the litterer's toss, the rat-poisoner's success), and, on the other hand stuff that commanded attention in its own right, as existents in excess of their association with human meanings, habits, or projects. In the second moment, stuff exhibited its thing-power: it issued a call, even if I did not quite understand what it was saying. (Bennett, 2010, p. 4)

The visual design quotes materials associated with the Anthropocene: plastic, waste, the beach. In this setting we chose four 'elements' to become our sonic actors: Stones, Plastic, Electricity and Water. As Bennett's response to the jetsam was an emotional one, our idea was to evoke certain feelings through the elements and their materiality, and look out for moments of empathy and alignment.[90] In addition to this assemblage two entirely different affect theories inspired our piece: One from the baroque era of music theory and the other from contemporary sociology around figures like Brian Massumi and Eve Kosofsky Sedgwick. For a music theatre project, these two references proved to be very fruitful. They spanned a thematic arc that elegantly combined contemporary theory with historical music theory.

Even before the rehearsals began, many questions arose in the team, familiar to those in *All Watched Over by Machines of Loving Grace* (2021): Can we really communicate with *things*? Or are we simulating it? How can we know? How do we establish relations that are not 'manipulative'? How can this communication then communicate with an audience? It often felt like the place of theatre was the most unlikely place to reveal the somewhat hidden 'power of things'. It concluded in designing our beach scenario as a test field and playground with open outcomes framed by four strategies:

- Mimicry and imitation of the materials
- Music-making with the technique of 'meditation-creation'
- (Sonic) animation of objects
- Focussing and increasing the sense of touch

In the search for moments of 'material agency' (Malafouris, 2016), the first way was to become empathetic with our elements through mimicry. We — the four performers — surrounded ourselves with each of the four elements.[91] We tried to expose ourselves to their materiality without manipulating it in the first place: feeling the weight and texture, the smell of stones or meditating in the midst of a pile of plastic with Pauline Oliveros' *Environmental Dialogue* (1974). We started to imitate the elements by rolling over the floor among and likening stones; dancing with and resembling a plastic sheet in the wind, dedicating ourselves towards an inner indistinguishability. We imagined that we should allow ourselves to be so strongly affected that we transform into these elements. Thereby we decided to evoke four allegories in reference to the baroque era, by linking each of these elements to a specific emotion. For each element we performed an 'invocation' that ended in a climatic song along with a presentation of a baroque allegory:

[90] This combination of *New Materialism* in an 'Anthropocene scenario' proves to be an apparently popular combination referencing the music theatre *Baleen* (2019) by *kollektiv international totem (KIT)* or the performance *Algae Opera* (2012) by Michael Burton and Michiko Nittaby.

[91] In the case of electricity, we surrounded ourselves with electric cables and devices.

Stone | Grief
Plastic | Joy
Electricity | Anger
Water | Solace

The next approach was to produce sounds while avoiding an intentional sonic result, remaining in a meditative state that privileges the tactile and olfactory senses. We were astonished that we clearly preferred the sensations, once the performers managed this task successfully. In a curious exploration of the materiality, the occurring sounds reached us with more information, and this information was more interesting if it did *not* anticipate a sonic result.[92] I call this meditation-informed sound-creation a *meditation-creation*, that seeks a non-dominant handling of things.



Figure 4-4: Photo from the jewellery interfaces and further 'jetsam' in *Mixed Feelings* (2021)

Another approach was to use media technology in animating objects. Following Andreas Weber's call for 'Enlivenment', we tried to 'bring things back to life - to fill them with life, to make them more alive' (2019, p. 25). We equipped polystyrene balls (the 'buoys') with motion sensors, loudspeakers and microphones, we put small radios in cushions that whisper into the audience's ears and we used DIY-jewellery as futuristic instruments (figure 4-3). These animated objects made our 'beach' more vivid and playful. Rolling the buoys over the floor not only produces the acoustic sound to emerge from its own materiality but also, via sensor and loudspeaker, results in a digitally processed rolling sound. The overlay of the real and the animated rolling sounds triggers an obscure sensation, and juxtaposes in a nutshell the experience of 'first and second nature' in the Anthropocene times.[93] In detail, my impression is that the buoys' acoustic sounds and their simultaneous digital animation effected tension in the perception. This effect emerges although we know that the impression of the coherence of materiality is itself to a large extent historically grown and socially constructed. Under

[92] It must be added that this exploratory play worked best for all performers on their very first attempt. Already in the following repetition, we noticed a stronger intentionality and mastery of the material - and this worked against our goals of non-manipulative *music-playing* inspired by 'material agency'.

[93] Link to scene: https://vimeo.com/1106694030/331b88b962?autoplay=1#t=10m45s

these principles of coherency, myriads of designers have constructed what feels 'natural'. With regard to the relationship between sound and materiality, design and motion-picture have accustomed us to specific artificial configurations that we sometimes no longer identify as fabrication.[94] Of course, animation represents quite the opposite of material agency. In animation, liveliness is artificially created by a human designer, whereas we were actually looking for 'Enlivenment' beyond the human realm. But between the juxtaposition of 'raw' materials (stones, plastic, water) and animated and functionalised objects, we encountered sonic agency stemming parallelly from two extremes, installing the human performers somewhere in between. In the 'invocations' of the elements, we committed more strictly to our non-manipulative approach, while in the allegories, we let human emotions run their course in theatrical relief. Engaging with the sense of touch was another relevant strategy to 'let the material speak'.[95] Our efforts to design touch for the piece resulted in small green cushions (we called them 'shards'), which are handed out to each visitor. The shards consist of a latex cover with a foam filling which enclose a small radio. A recorded narrator's voice sounds from the radio during the course of the play. The soft design and quiet voice invites the audience to a tactile sensation, which makes the audience part of the infrastructure; each visitor thus becomes a piece of flotsam.

The format of (music) theatre proved to be a challenge for probing material agency. In the beginning of this chapter, I mentioned how an artistic space is framed by markers that distinguish the ordinary from the specific. As the concept of material agency can be applied to every-'thing', probing it in the theatre format becomes a somewhat quixotic undertaking. The gesture of 'let them speak for themselves' not only holds a simple paradox but it undermines the role of subjectivity. This dilemma of curating the 'noteworthy' moments of material agency is pointed out by critics of *New Materialism* (Schneider, 2015, p. 13; Donovan, 2022, p. 70). The concepts of *New Materialism* might clash with the ostentatious gestures of the theatre format, as they annul every border that frames the artistic space. At the same time, Rebecca Schneider points out the irony that in theatre culture material agency is just common sense:

> Even as we are now expanding the realm of liveness beyond actors to theatre's materials — props, sets, lights, sound, makeup, and all the backstage machinery supporting the fretting and strutting about — haven't theatre practitioners long recognized their objects and affects as actants? (Schneider, 2015, p. 14)

Recapitulating the project's goals, I evaluate that, for me, an example of material agency which affected me occurred primarily in mixtures and switches of our four different strategies. Only in those moments of simultaneity and rapid changes, I had the impression, that in fact the 'things' were in charge of the action.

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[94] An extreme example is the new generation of electric cars, which play a fictional engine noise to the driver via the loudspeakers because the electric drive is otherwise too quiet and entails a safety risk. Through the industry's efforts to standardise and promote this, the standardised noise profile takes on an almost 'allegorical quality'.

[95] Designing touch for theatregoers is quite a logistical challenge. In the first place, *Mixed Feelings* (2021) was intended to become a long-duration installation, allowing the audience to engage one by one with tactile experiences. But the format had to be changed to a performance mode due to the pandemic.

4.6. Summary and Transition

Moving away from the musician, other players shift into our focus: the environment, room resonance, software, machines, objects, and 'things' come into the foreground and gain agency. In return, these new players delegate 'alternative' functions to the musician. Concepts such as the 'performance ecosystem' (Waters, 2007), *Actor-Network-Theory (ANT)* and *New Materialism* reformulate the common understanding of who is 'in action', and what the performers of music are. Probing *ANT* as an artistic programme suggests taking advantage of the complex relations and potentials that lie within the performance ecosystem (the 'software', or the 'capacity'). Thereby unlocking electronic and digital entanglements gives access to 'phenomenological black boxes' like microphones. Several works in the portfolio demonstrate how these ideas give rise to new compositional strategies, and lead to stage settings with non-conventional use and positioning of microphones and loudspeakers. These enable musical arrangements which activate the multitude of each 'actor' in modalities of input, distorter and output. And it results in designing situations that prevent human control and traceable signal chains, favouring complex dynamic networks instead ('messiness').

Further leaving the musician's body and exploring 'material agency' (Malafouris, 2016) emphasises moments of closeness, tactility, and intimacy. In practice, this led to meditations on materials, the design of whisper cushions and the performers' mimicry of stones. Nevertheless, these ideas of *New Materialism* prove to be quite difficult to apply in artworks especially if one speaks on behalf of the 'artworks author'. *ANT* and *New Materialism* do not abolish the musician — neither do they regard humans as the subjects or means to an end: But transcending the duality of subject/object, they consider every-'thing', every actant as a potential, a capacity for reaction, alteration and resilience. As an effect, I came to the impression that probing these ideas shifts the focus from musical sensation to the act of (sonic) communication.

Circling further away from the musician, and even from solid material, we will end up with the disembodiment of 'sound itself'. Artist and researcher Salomé Voegelin has profoundly transferred ideas of *New Materialism* to the field of Sound Art: into *Sonic Materialism* (Cafeculturene, 2018). What is important to Voegelin is an emancipation of sound from its function as signifier; not to reduce sound to a source or the attribute of a source, but grasping the vivid reality of sound itself 'because that is essentially what sound does: It isn't, it does. It is a process, it is ephemeral, it is temporal, and yet it is a materiality' (Cafeculturene, 2018). Do we thereby land again at the 'reduced listening' of acousmatic music? Not at all: Voegelin's 'Sonic thinking' is a clear rejection of any attempt to hypostatise sound and music as objects, encompassing a much broader philosophical and political context. Still, I would like to draw attention to the circular movement of the last four chapters, beginning and landing at a situation where we face the 'sound itself'.

5. Around Acoustics

> Is it an exaggeration to say that composers after Beethoven, the vast majority of them hearing, were forever changed by a deaf aesthetic? (Frank, 2020)

After starting in the first chapter with the abstraction of music in the studio, we somewhat landed again at 'sound itself' at the end of the last chapter. In the course, many moments occurred where the performativity of music appeared in the correlation of acoustic phenomena with visual sensation. Coming back to the (assumed) sensory modality of music — the acoustic — I will segue into the last chapter *Around Acoustics*.

5.1. Autonomous Music and Multiple Senses

As one of the seven Artes Liberales, music has always had a special position among the arts in the European-Christian tradition. Alongside mathematical disciplines such as arithmetic and geometry, music was understood as an art that is close to logic and rationality. In the tradition of body hostility rhetoric in antiquity and the Middle Ages, the concept of (good) music as something *abstract* was established — in contrast to an embodied, ecological notion of music. For me, this thread also expresses in the musical avantgarde of Schönberg and his serialist followers, categorising music into a finite number of parameters, as well as in the acousmatic music of Schaeffer that seeks to emancipate from the ecology of the sound's source. Sound reproduction technology helped to cement this abstraction in isolating music in material manifestation. For instance, the needle that inscribes and reads out the spiral groove of a vinyl shall not interact with the visual conditions of the surroundings. Addressing music explicitly as a phenomenon that solely exceeds acoustic sensory stimuli brings us to the concept of *multisensorality*. Representatives of poststructuralism have paved the way for multisensory thinking - described by the musicologist Holger Schulze as follows:

> The color, the sound, the heat, the smell, or the emotion of anything is propagating and extending its particular energy into the corporeal area of you and me. Such it is — following Deleuze and Guattari — not at all correct to say: *I see* a color or *I hear* a sound. These sentences represent only the fallacies in hegemonic perceptual models. Yet, it would be more correct to say *I am (full of)* these sounds. *I am (full of)* these colors. (Schulze, 2018, p. 205)

A multisensory approach argues that perception is always a multimodal *embodied* experience; that even sensory stimuli that seem to take place only in one sense (e.g. sound) hold rich and individually formatted interactions to other senses (Clarke, 2005). Therefore, each experience holds an inseparable simultaneous interlocking of various sensory instances. This assumption is moreover

supported by findings from the field of contemporary science, as a report on multisensory hearing summarises:

> Although the majority of hearing individuals will focus on sound as the core of music experience, it would seem that a more inclusive and nuanced consideration of music is possible when taking a multisensory perspective involving the integration of sensory inputs from touch, sight, and balance. (Russo, 2020, p. 43)

While we tend to isolate and abstract each of the human senses, an ecological approach reveals the individual bodily embedment of our own 'fleshy sensors' (Gibson, 1979). Being an umbrella term, using the notion of multisensorality can become confusing especially in the arts: Is it about translation, transmission, combination, equation or the 'collage' of the senses? Does multisensory really take place on the sensory level, or is it just a metaphor? Is it produced by the artwork or does it simply take place? Who is addressed with multisensorality and with what motivation? And what are inter- and transsensorality?

Undertaking a comparison of the terms *multi-, inter* and *transsensorality* leads to a systematisation. This lets us derive different *degrees* of how much the different sensory stimuli are 'integrated'. The axis spans from no integration (isolated senses) to full integration (transssensorality). Turning this axis into a circle creates space for notions ranging from various phenomena to artistic genres (figure 5-1).

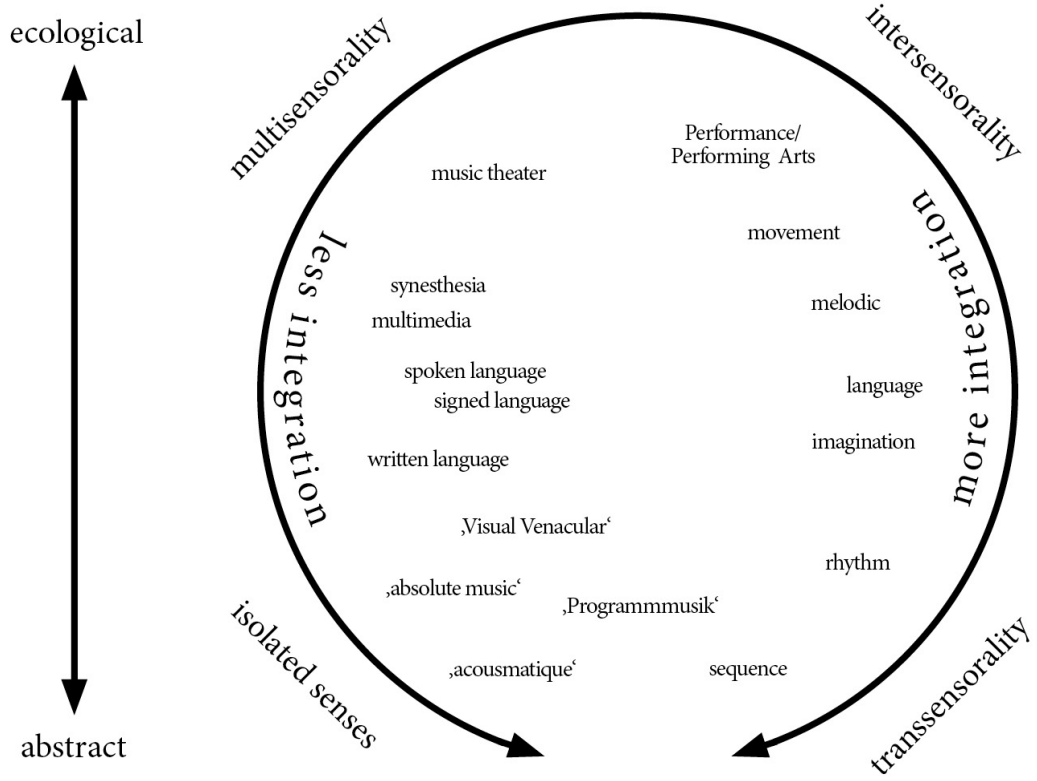


Figure 5-1: Graphic of degrees of 'sensory integration'

The integration of the senses increases following the circular arrow clockwise, while it decreases counterclockwise. At the end of the circular arrow in the direction of *less integration*, we can find

phenomena and genres that take place in only one sense such as acousmatic music, indicating *isolated senses*. Although the romantic concept of *absolute music* also seeks this 'isolation', I position it further clockwise on the 'integration circle', because often instrumental activity emits non-acoustic side-effects (residual movements). Many art genres toward modernity took a further 'clockwise direction' in favour of a 'mixture of the senses': e.g. in Dadasim, Fluxus and Performance Art. But the way Avantgarde and Bauhaus movements conceptualised these 'mixtures' still carries an understanding of purity: Isolated sensory 'layers' come together in multimedia or multisensory 'counterpoint'.

> In Kandinsky's view, multimedia counterpoint can only occur if the non-musical elements take on the qualities of absolute music. (Gawboy, 2022, p. 240)

In the case of Kandinsky we face a rather rhetorical, declamatory character. Referring to his paintings as 'compositions', the mixture of senses is only perceivable within the work's concept, not in the experience. It is therefore always necessary to look at the extent to which a translation is more of a metaphor or whether really an integration of sensory stimuli takes place.[96] A different case is when Scriabin composes in relation to colours in his composition *Prometheus* (1909/10). His synesthesia that correlates auditory with visual stimuli is put into an artistic programme and results in a layer representing light. Further clockwise, we find the Performing Arts that rely on and encompass a strong(er) integration of the senses. Ako Mashino and Elina Seye write in their investigation of the physicality of dance and music, considering different cultural music-making practices, the following:

> Performing arts emerge as a multi-sensory integration of body movements and sound: aural, visual, tactile, kinesthetic, and osmotic information might pour into us simultaneously, fully consuming our body and mind. (Mashino and Seye, 2020, p. 28)

These inseparable interdependences of the sensory perception become what is often called *intersensorality*, transcending the principle of the mere 'sensory collage'. It does not only combine but mutually induce and embrace the 'sensory integration' towards an indistinguishable 'percept' (Deleuze and Guattari). The two-dimensional space of the figure allows to indicate that sometimes genres hold multiple positions at once. For instance, the genre of the 'Program music': Smetanas *Moldau* aims to evoke a virtual (intersensory) experience via solely auditory realms. Going further clockwise, not only does the 'sensory integration' increase, but also the sensory specificity decreases. Here, to be found is the term *transsensorality*, describing patterns, sequences or forms that are not bound to a sensory stimuli. Film theorist Michel Chion lists *rhythm, texture, material and language* as 'trans-sensorial' examples, only elaborating *rhythm* on the basis of his research in the field of film theory (Chion, 1994, p. 136). Coming to transsensory realms, we find more and more abstract terms. Both ends of the circular arrow reveal abstract conditions. An additional vertical arrow therefore indicates the range from *abstraction* (bottom) to a rather *ecological* manifestation (top) of the 'sensory integration' (figure 5-1). At the small gap at 'six o'clock' there is a tipping point: While a rhythm holds the potential of being sensed visual, auditory or tactile, it 'jumps' to the left as soon as it 'manifests' in a specific sensory stimuli. Also mechanised translations such as visualisations of

[96] This differentiation becomes again important in the following when Deaf perspectives are taken into account, because the idea of an 'audio-visual counterpoint' presupposes the ability to see *and* hear.

sound take place in this area. A sense-isolated medium — e.g. a mp3 — is first translated into transsensory parameters, and back into another sense-specific medium e.g. waveforms. Although the terms multisensory and intersensory are often used synonymously, they reveal very different motivations, perspectives and contexts. *Multisensorality* tends to be understood as something that is constructed, *intersensorality* as a multimodality that 'just takes place', and *transsensorality* as a potential that is not (yet) manifested on a material basis.

5.2. Music from Deaf Culture

Since 2021 I have been involved in various collaborations with Deaf and blind artists.[97] These activities started with the music theatre work *A Singthing* (2021), and led to a continuous working relationship with a music theatre collective called *[in]operabilities*[98] that brings together artists with different 'perception styles', a term coined by performer, choreographer and disability rights activist Fia/Sophia Neises (Theaterbremen, 2022) and sociologist Siegfried Saerberg (2007).[99] *[in]operabilities* links the art form of opera to the question of its accessibility and probes bilingual and intercultural collaboration of music theatre and Deaf culture.

Deaf culture has developed a broad field of unique and independent artistic practices, terms and styles with and without language such as Sign Poetry (Clayton Valli, Ella Mae Lentz [figure 5-2][100]), Visual Vernacular (Bernard Bragg, Ian Sanborn), or Visual Sign (Eyk Kauly). While some practices show a genuinely visual display, there are as well many artistic positions and genres from Deaf culture that explicitly deal with music — not only as translations, but as originals. The bandwidth here ranges from conceptual approaches (sound artist Christine Sun Kim) over such that embrace traditional music culture (musician Paul Whittaker), works that discuss and probe sound thematically (*The Voice* [2024] by choreographer Rita Mazza) up to low frequency performances (Matthias Ranner's vibration music 'Vibrik'). Some Deaf musicians like classical drummer Evelyn Glennie or Hip-Hop artist Signmark even position themselves within hearing music contexts. All of these positions challenge the common understanding of what a musician, music-playing, and music is.

[97] The artists with disabilities I work with define 'disabilities' according to a social model, whereby they are disabled by the normative standards of (mainstream) society. Furthermore, the Deaf artists I work with identify themselves as part of a community with its own culture and language, reflecting in the use of a capital 'D'.

[98] A play on words combining *opera* with *abilities*.

[99] German: 'Wahrnehmungsstile', translation LH. Others use 'mixed-abled' or the phrase 'disabled and non-disabled'.

[100] Link to video: https://www.youtube.com/watch?v=jYGCYDzjj8c



Figure 5-2: Stills from the poem *Eye Music* (1995) by Ella Mae Lentz

Those practices that explicitly deal with acoustic phenomena take place within the spectrum of intersensory modalities. Such *Expert listening* or *Deaf listening* describes the highly individual handling of Deaf people as well as those who are hard-of-hearing of acoustic phenomena.[101] This can involve a listening experience in an alternative accentuation of the frequency band or at a specific loudness, the sensation of vibration, as well as the visual appearance of music-playing. *Expert listening* brings attention to the intersensory qualities of music. An embodied practice of music further integrates and amplifies these aspects. In this change of perspective, as a composer I have to completely re-evaluate and renegotiate what constitutes a musical performance. For instance, what I considered to be the 'residual movements' of music-playing[102] might become the main attraction.

Writer and researcher Gunda Schröder unfolds an embodied singing approach from a hard-of-hearing perspective, which could be called an 'expert singing':

> Striking the note from within. Not from the outside, from auditory perception, but from body awareness, from within. The note is struck from within if the sensation of resonance becomes established in a multisensory, multidimensional topological landscape of various inner spaces and connections. If this quality comes from within, the 'struck note' is linked to other sensory impressions. (Schröder, 2020, p. 409, translation LH)

Expanding the common notion of music activity into such practices as 'signed singing' or 'expert singing' enables joint artistic collaborations of teams and audiences with different cultural contexts and 'perception styles'. In the past, there has been little exchange between d/Deaf artists and contemporary composers, even though there are vast examples of works that include body movement and gestures (Kagel, Schnebel, Aphergis, Globokar) or sign language parts (Helmut Oehring) in their compositions. While a deductive engagement of sensory integration reveals many points of connection and similarities, the socio-cultural barriers might prevent more exchange. In this

[101] Deaf studies researcher Jessica Holmes notes: 'There is no typical experience of deafness, and deaf people do not form a single, homogeneous social group. Rather, d/Deaf people relate to 'deafness' in vastly different ways: deafness entails a combination of individual audiological characteristics, linguistic preferences, identity politics, and in some cases technological constraints — what amount to an idiosyncratic set of variables that shape musical experiences in profound ways.' (Holmes, 2017, p. 175)

[102] See subchapter 2.4. Residual movements

context, the often self-referential music scene could take the growing awareness of inclusion as an opportunity to contribute its enthusiasm for experimentation, its awareness of form and its competence in organising heterogeneous material. But to do so, this music culture itself would have to change too and meet halfway with other cultures.[103] In the last few years, this has already started to change as several d/Deaf or mixed-abled groups and ensembles emerged in contexts that address audiences with different perception styles: These groups, including Deaf choirs (*Singende Hände, Klingende Hände*), mixed-abled and interdisciplinary teams (*ensemble in transition, [in]operabilities*), research-based formations (*The Sense Ensemble*) as well as project-based collaborations (*Ensemble Ictus, Ensemble Tzara, ox&öl*) did find individual and unique aesthetics with modalities of music 'around acoustics'.

5.3. Intersensory Arias

The first work in the frame of my group *[in]operabilities* was a music theatre work entitled *A Singthing* (2021).[104] In the programme text of the piece, the question is posed whether music could really be that 'universal language' — as the popular saying goes — and if so, what this language would have to look, sound and feel. At the same time, the piece questions the whole genre of opera that makes a promise about being a 'multimedia' (and therefore multisensory?) experience. As the work process was highly experimental, our outcome involved various kinds of methods to different degrees of 'sensory integration'. In the process, our team found a way of working, wherein individual perception styles and shared artistic preferences became the motor for making decisions. *A Singthing* (2021) consists mainly of three solos ('arias'), which were developed and performed by three performers.[105] In the order of appearance in the piece the three 'arias' are:

- 'Nessun dorma' by Giacomo Puccini, interpreted by percussionist Sabrina Ma.
- 'Lasciatemi qui solo' by Francesca Caccini, interpreted by myself (LH)
- 'Pleurez, mes yeux' by Jules Massenet, interpreted by actress Athena Lange

Each aria is introduced with a preface by the performers, in which they explain their individual approach and choice of the aria. This recourse to a biographical moment creates the context for the interpretation that follows. The aim was to explore the format of the aria as intense, expressive and virtuosic climaxes, as opera's 'essence'. The question is posed, if an aria is really a 'sing-thing': something that *must* be sung. Based on the biographical backgrounds and the individual professions of the performers, the idea was to find alternative means of interpreting an aria other than to sing it.

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[103] In return, I see the potential for the academic music scene to free itself from its rigorous adherence to the cult of the composer and the work concept, and the rhetoric of music's (superior) sound specificity. Such a shift of paradigm would offer the possibility of transcending the 'dialectic of the extramusical' (see subchapter 2.6. *Extramusical vs Concert-ish),* and open up new takes on performativity.

[104] Link to video: https://vimeo.com/652525608

[105] The main authorship of the solos belongs to the respective soloist and to the director Benjamin van Bebber.

The main authorship of the solos belongs to the respective soloist, director Benjamin van Bebber, and me.



Figure 5-3: Still of Sabrina Ma performing a gestural interpretation of the melody of 'Nessun dorma' in *A Singthing* (2021)

In the first aria, Sabrina Ma talks about the melody of her aria and then says, 'the melody goes like this…', whereupon she performs a short sequence of alternating movements with her hands in a specific rhythmic and spatial succession: a visual interpretation of the famous melody of 'Nessun dorma' (figure 5-3). Ma performs these movements, that might suggest pitches for some, for others a choreographic original of gestures. Sometimes with flat palms, sometimes with fists, Ma writes lines and dots in the air. The original melody is reformatted via transsensorial aspects: The movements and gestures follow the melody's rhythm. On the last note, her hands begin to make a long crawling movement, and at the same time the lights in the room begin to flicker. This version of the melody then repeats several times while further movements increasingly involve the whole body and spread out into the room. Ma accelerates and expands her body movements from subtle facial expressions to an energetic shaking of the whole body, which causes intersensorial effects. The body's energy carries on in the acoustic and tactile sensation which trigger vibrations.[106] As a professional percussionist, Ma replaces the singing of the aria with 'drumming' her aria. Not drumming on the surface of the nearby timpani, but in the air, underlines both, the visual sensation of the drumming as a body movement as well as the (visually mediated) absence of sound. The drumming constantly changes surfaces and directions, producing gradual sensual transitions: tapping the face, the body, across the floor, onto the air. These changes of the different surfaces create simultaneities and gradual shifts in the sensory proportions.[107] As a rule of thumb, we found that increasing the level of physical energy of the performer also raises those intersensory (side-)effects.[108]

[106] Depending on the stage's floor, these were at times astonishingly strong in comparison to the vibrating bass shakers that were also used in the piece as a mechanical source of vibration.

[107] Terms such as 'simultaneous', 'change', and 'shift' always depend on the individual perspective: A gradual shift of a drumming from the floor to an air drum is a shift only for a hearing person. A team for d/Deaf dramaturgy ensuring that there was no long absence of sensory information.

[108] In analogy to *residual movements* from chapter II, one could speak of 'residual sounds' as well.

In her solo, the Deaf actress Athena Lange interprets the aria 'Pleurez, mes yeux'.[109] The starting point of the aria's development was a TV recording of 'Pleurez, mes yeux' performed by the singer Maria Callas in Hamburg from 1962. Using the visual appearance of Callas' performance as the main source along with the libretto, Lange created an (un-sung) aria with highly aestheticised and choreographed 'signed singing', using poetic German Sign Language, gestures, facial expressions, and movements of the whole torso. Several contributions in Deaf studies address such *Deaf Music* or *Signed Music* through musical parameters like rhythm, melodicity, transposition, and repetition.[110] Many of these parameters could in turn be framed as 'transsensory qualities'. The sign language performance of Athena Lange strongly takes advantage of all these qualities. As I am neither fluent in German Sign Language, nor part of Deaf culture, I am not competent to analyse the linguistic aspects of the 'signed singing'. An adequate analysis of her aria must include a Deaf perspective. It must also be considered from case to case, to what extent it would be appropriate to examine art by Deaf artists through conventional music terminologies, especially if these terminologies solely stem from hearing cultures (be it mainstream culture or academia).

With the format of the aria, we exposed our bilingual and bicultural audience to a lot of (hearing) music culture. In reaction to this the team urged to give a substantial context and explanation in the programme note, as well as in the work-immanent introduction. Here also possible sensory gaps are pointed out, which we tried to equalise for different perception styles. We created and intertwined a d/Deaf dramaturgy duo (a tandem of Emil Leske and Susanne Tod) together with a dramaturgy for hearing people (Franziska Henschel) in parallel, which made each solo a puzzle with unique characteristics and solutions. By working with imaginations, we urged to find shared grounds that would circumvent sensory gaps and bridge the parallel (Deaf and hearing) dramaturgies. For instance, a text projection induces an 'imagination layer' behind Lange's performance, which reads: 'We image: Music, an orchestra plays'.[111] Always appearing in moments when Lange's performance pauses, this track accompanies and interacts with the mise-en-scene as a 'transsensory counterpoint'. While Lange starts to shake in a Callas-like posture with her whole body, the text projection reads: 'Suddenly: trembling sounds. Like a landscape in the fog'. The text acts as a 'reversed caption', describing the effect of an absent orchestra in a highly visual language. Thereby the written language opens up an imaginative space that tries to address all individual perception styles.

While the target audience of this piece were both d/Deaf and hearing people, the works by the collective that followed also address blind and visually impaired people as audience. This led to an additional *blind* dramaturgy, which is also elaborated in duos (alternating cast of Pernille Sonne, Naomi Sanfo, Jeanne Charlotte Vogt and Caro Jüngst). This brought into the team a practice of integrated audio description. In contrast to a common audio description — where mostly blind people get handed out headphones —, an *integrated* audio description is work-immanent and

[109] Link to scene: https://vimeo.com/652525608?autoplay=1#t=43m1s

[110] See the publications of the project *Signed Music* by J. S. Cripps *et al*., the writing of Silvan Brétéché, the studies with the *Sense Ensemble* led by George Higgs.

[111] Translated here and in further courses from German by LH.

hearable in the whole performance space. Our style of a blind dramaturgy tries to use not too much language but rather works with sounds as means for orientation.[112] Rather than describing the performative actions, this style enables orientation by building a network of referential points. A work-specific memory is established so that a blind audience member hears the actions in space in a more direct, expressive and independent manner. For instance, a performer wears a rattle with a distinct sound of her wrist. If the audience is introduced to this information, it enables orientation in further courses. Hearing and locating the rattle within the environmental context spares the typical (auctorial) audio description. Thereby it is possible for blind and visually impaired audiences to have an independent and individual experience. All these techniques highly take advantage of the intersensory effects of music-playing and performativity. Enabling orientation even becomes its own sound design. Bringing in blind perception styles even increased the logistic complexity. For instance, not only the content, but the *emphasis* of a signed part shall be accessible for a blind perception style.

Since then, our 'tool-kit' has further developed and by now involves the following approaches and techniques.

- Canons with simultaneous audio-visual rhythm (e.g. knocking on chest) with sung, spoken, signed and danced verses/layers. The signed 'verse' is audio-described, focussing on the physical movement of the hands, as the meaning is already sung in spoken language. This follows the aim to mediate the presence of sign language for blind and visually impaired perception(s).
- Tactile vibrations: The tribune vibrates via head-sized bass shakers mounted under the audience's seats. Signals of live voice, cello, kalimba, theremin are transposed down into non-acoustic frequencies between 5 - 20 Hz.
- Wind impulses, which are rhythmically blown onto the surface of the audience's skin with large fans (e.g. interpreting an interlude of Handel's *Furibondo spira il vento*[113]).
- Work-integrated (sung) audio-description
- Rhythmic, aesthetised sub-, over- and 'allover'-titles ('Überalltitel'). Subtitles as autonomous actors
- Multiple outputs into various sensory stimuli from one activity, for example the 'multi-sensory keyboard' (figure 5-4) from *A Singthing* (2021). This midi keyboard is reprogrammed and activities on it result in:
    - Sonic sensations (synthesizer sounds)
    - Tactile sensations (bass shakers vibrations)
    - Visual sensations: Low frequencies feed a large loudspeaker's chassis. On the chassis, a transparent blue foil is attached. A spot light shines on this foil and creates rhythmically flickering light effects.

[112] Fia/Sophia Neises brought this approach and the associated expertise into the team.

[113] Link to scene: https://vimeo.com/652525608?autoplay=1#t=16m24s

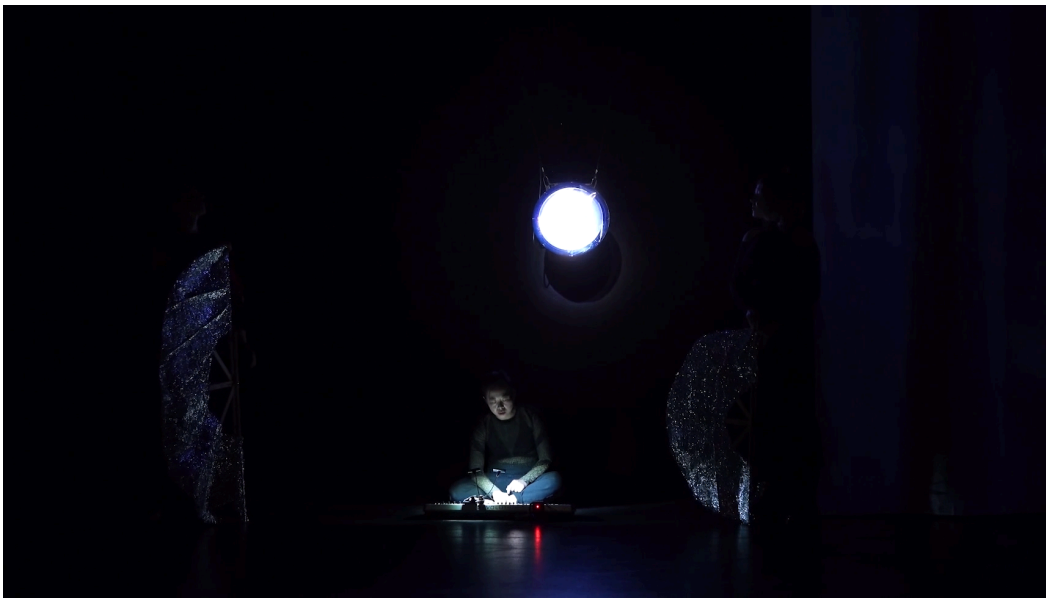


Figure 5-4: Ma plays *Furibondo spira il vento* by G.F. Händel on a 'multisensory keyboard'; Hofmann and Lange hold glittering fans that push wind into the audience in choreographed sequence.

These approaches and techniques were further developed and applied in the music theatre works of the collective *Die Insel* (2024a)[114] and *Die Wellen* (2024b)[115].

5.4. Translation, Creation and Equivalence

What is considered as a movement, a gesture or a sign, what is considered abstract or concrete, poetic or prosaic is a question of perspective, culture, language and knowledge. Yet, the omnipresence of musical metaphors often blurs what is perception, proclamation, metaphor, translation or imagination. Various studies of embodied recognition suggest that our mind produces corporal analogies, as 'the listeners may mentally simulate sound-producing body movements' (Mashino and Seye, 2020, p. 32). A 'high pitch' or a 'melody's path' are thereby not only visual metaphors. Sonic, visual, spatial, and tactile impressions might mentally emulate each other. Furthermore, our perception is likely to be strongly influenced by the power of language itself. Metaphors therefore perhaps have a stronger intersensory effect on our perception than our (linguistic) logic wants to dissuade us out of it (Lakoff and Johnson, 1980). This suggests that there are transsensory experiences and examples of pattern recognition which in turn reflect how imagination and language are formatted. Speaking of 'signed singing' or 'visual music' could therefore transcend the state of mere metaphors, especially if we assume embodied, intersensory recognition.

[114] Link to video: https://vimeo.com/1005574167

[115] Link to video: https://vimeo.com/1061547600

Nevertheless — or subsequently? — the obsession in the (Western) music cultures with their own acoustic mediality can appear rather puristic. Classical music culture has cultivated its 'sense specificity' excessively.[116] On the other end of the spectrum, I locate the whole field of poststructuralist theory with its anti-ocular turn, in which a multi- or intersensory approach shifts slightly towards a holistic thinking. Both of these extremes express strong opinions about the senses, for example when the sense of sight is often attributed with objectification and 'regimes' of the gaze. While most of such speculations actually want to explain a philosophical concept, the senses must serve as symbols for certain human attitudes and behaviours. Nonetheless, there are pieces, especially from the experimental music scene, which do address 'the hearing' without any 'superiorism' or 'metaphorical evaluation'. The *Headphone Pieces* (2015-18) by Louis d'Heudières, the *NO-MUSIC: earpieces* (2016-24) by David Helbich[117] or the works by John D'Arcy and Clara Kane[118] do find poetic experimental arrangements that also include those bodies attached to the listener's ears.

Next to this 'sense metaphorism' there is another tendency that is worth having a closer look, which is the concept of translation. While translation studies at an early point critiqued and refined the concept of translation towards a subjective and creative understanding, the colloquial concept of translation as a linguistic affair masks the heightened affordances when it comes to inter-semiotic translation. In the course of working with accessibility in the arts, one is often confronted by the naive confidence in translation. This can prevent a precise analysis of what is actually happening at the level of materiality, and thereby (unintentionally) create and perpetuate hierarchies of power that are inherent in every translation. Therefore in the context of Disabilities Arts, the creative impact of every translation is never to be underplayed. An inter-semiotic translation (e.g. visual sign/movement into auditory phonetics/sounds) involves an increased creative 'sculptural effort' and thereby a higher level of personal involvement and cultural contextualisation. This calls for new terms as proposed by researcher Josélia Neves with the notions of (trans)adaptation or (trans)creation in the context of accessibility (Neves, 2020). Each inter-semiotic translation must be regarded as an original:

> Notions such as source and target texts may also be challenged because there may not be a clear one-to-one relationship/equivalence and the 'target text' may be an original text/event in its own right or a unique complex mixture of diverse stimuli. (Neves, 2020, p. 325)

The aria 'Pleurez, mes yeux' by Athena Lange exemplifies such a (trans)creation (figure 5-5). Although it is an interpretation, it is also an original because not only the language is translated but also the (dominant) sensory level changes. The translation becomes another perspective. However, this is still a minority, as translation as a discrete, 'neutral' service is still dominant in the arts. For example, theatre performances are often translated by interpreters that stand on the sidelines; or attempts to create equivalences between senses by the use of technical apparatuses. In these mono-directional approaches of 'service for inclusion' and automation, there is a specific hierarchy of normativity. Thereby, the spectrum of (not) understanding and (not) sensing that concerns us all is neglected.

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[116] Maybe even more insistent in a wounded distinction to (visually affine) Pop music?

[117] Link to documentation: https://davidhelbich.blogspot.com/2010/02/keine-musik-ohrstucke-earpieces-in.html

[118] Link to video: https://vimeo.com/53541130



Figure 5-5: Photo of Lange's (trans)creation of the aria 'Pleurez, mes yeux'

It is important, however, to respect the diverse modality of different perceptions: A visual pulse has another emphasis than a tactile or acoustic pulse. Visual rhythms in a 'signed song' are embedded in a whole other expressive and meaningful way that are not equivalent to sonic or tactile rhythms. While acoustic singing has a room resonance that can feedback spatial information, the 'resonance' in sign language rather lies in the memory of the 'signed space'. Transsensorial parameters such as rhythm should therefore not become a pretext for inter-semiotic and intercultural shortcuts in translation processes. Accepting this subjective impact in the act of translation implies a rejection of (sole) technical and automated solutions of sensory translation, for instance developments like the *Sound Shirt*: a vest that translates music into a tactile sensation by using 16 small vibrating motors embedded in it. The layout of the motors on the vest represent a miniature orchestra on the body of the wearer. Here, the transsensory parameter of *intensity* becomes the medium of translation. According to the developers, with the *Sound Shirt* 'deaf people can really experience a classical concert for the very first time' (SOUND SHIRT, n.d.). Such a conception of technical translation follows the approach of an equivalence between two isolated senses (acoustic and tactile). This happens without much consideration of all the culturally encoded specificities and without any feedback to the music culture that initiates and supervises this translation — in the assumption that Beethoven does not only sound brilliant, but also feels good. By the (sole) use of such automated inter-semiotic translation tools, art institutions even tend to immunise against alternative perspectives.

The alternative approach is known as the 'Aesthetics of Access', which was substantially developed by the *Graeae Theatre Company,* and encounters accessibility as work-immanent artistic potential. This

happens in contrast to the predominant procedure to gain accessibility via an additional service for specific groups after the work is done. Creating accessibility thereby shapes the whole artistic process, and becomes its own aesthetic. The approach of the 'Aesthetics of Access' goes together with a distinct political and activist agenda that claims participation, leadership and representation of artists that identify as people with disabilities. The works by *[in]operabilities* are informed by the 'Aesthetics of Access' interviewing Deaf and blind dramaturgies, integrated audio description, integrated touch tours, integrated sign language and a heightened sensibility for *(trans)creation.*

Opera is a genre in which a high number of people accept 'not to understand everything'. Be it the often foreign Italian language, the incomprehensibility of the sung words, or the many twists, characters and masquerades in baroque plays. Audiences in opera are used to the fact that there is much to be missed. Typical access tools such as opera glasses or subtitles have been part of opera culture for a long time. I envision opera as a genre that still encounters the promise of a multidisciplinary and multisensory 'Gesamtkunstwerk' — but under new conditions and perspectives. While I often heard that opera is too complex or too encrusted to become more accessible, I suspect the opposite; that music theatre has some unique potential to balance and composite senses and languages in the spirit of the 'Aesthetics of Access'.

5.5. Summary

Circling around and away from music as an acoustic phenomenon leads us to a broader investigation of sensory perception. While some music cultures and styles follow a purist conceptualisation, others flirt with a sensory 'mixture'. Within many genres of art and music, sensoriality is negotiated programmatically. Systemising the notions of multi-, inter- and transsensorality helps to differentiate what is really going on at a sensory level, and what is rather rhetoric in respect to translation or metaphorisation. My collaboration with the collective *[in]operabilites* — involving artists with different 'perception styles' — encompasses a music theatre practice with various uses of multi-, inter- and transsensory design. The first piece of the group *A Singthing* (2021) probes a wide range of techniques in order to achieve a shared and equal experience in mixed-abled audiences. In creating *A Singthing* (2021), the moving and sounding human body proves to be an ideal 'intersensory instrument', as bodily performativity emits expression into various sensory stimuli. Together with multisensory couplings (e.g. sound to light, movement to vibration), as well as with transsensorial parameters (rhythm, intensity or 'embodied melodicity'), the piece *A Singthing* (2021) attempts to achieve music-playing around acoustic phenomena. While much historical and contemporary music incorporates non-acoustic elements, involving different 'perceptions styles' enforces a precise look at normative hierarchies of translation and creation. The notion of Josélia Neves's *(trans)creation* reacts to these hierarchies, advocating for appreciation of the creative impact in inter-semiotic translation. The work of *[in]operabilites* embraces knowledge from the 'Aesthetics of Access' that seeks to create accessibility via a work-immanent concept. Alternative dramaturgies and integrated audio description thereby also delegate a distinct ecological role to sound. Sonic design becomes the means of

orientation. Such a blind dramaturgy enables an independent and subjective experience of the actions on stage. Working with artists with different 'perception styles' brings attention to normative assumptions of the senses, and lays bare the obsession of music cultures with the acoustic mediality. Circling 'around acoustics' therefore suggests both: *awareness for* sense-specificities and *transmission of* sense-specificities.

Summary and Future Work

Just as I find my artistic practice to be highly heterogeneous, this writing may have turned out the same way. I cannot stop marvelling at how diverse the conditions of music and performance remain to me. Therefore this endeavour turned at times into a paradoxical ghost search. Where the performativity of music-making seemed too evident, it was of no interest to this project, and when it was interesting, it became a scheme that was constantly fleeing from being captured in writing. However, the motif of 'circling around' helped me to embrace this heterogeneity.

The results of this venture are rich: Chapter 1. *Around the Studio* delivers an embodied approach of making temporary homes *for* and *with* sound. The figure of the 'ritournelle' by Deleuze and Guattari is modified into a programme of musical performativity. Using the example of the sound studio, I explore the potential of music between abstraction and embodiment. Further, I clarify how the loudspeaker's virtual space is addressed in basic constellations of stage, sound, and performer, deriving typical performative 'access points'. Chapter 2. *Around the Instrument* points out the blurred and inconsistent conditions under which our perception constructs the act of musical playing. By differentiating sonic agency from 'residual' and work-immanent movements, I lay out an understanding of playing music as a communicative achievement. Chapter 3. *Around Formats and Fictions* sharpens the act of playing music as an autopoiesis. Here, I detect a specific conjunction: The purposefulness of performativity and the meaningfulness of sound build a formula, which remains active even in its violation, and becomes a vessel throughout format transferences and simulations. In Chapter 4. *Around the Musician* I deduce alternative 'players of music'. This results in new means of (co-)composition. By shifting away from human references, I discover 'actors' of music in the near (material agency), in the far (resonance), and in the intangible (networks). In Chapter 5. *Around Acoustics* I bring together uses of multi-, inter- and transsensory designs of music, in which the human body proves to be an 'ideal instrument'. Confronting normative assumptions of the senses with different 'perception styles' advocates for the awareness of sense-specificities, yet argues for their transmission within the 'Aesthetics of Access'.

By today, the playing field for inventing 'music-playing' has increased dramatically and at the same time the prerequisites necessary for music to occur have decreased. If, why, and how performativities around music take place must be described as a potential. Neither the 'digital gap', nor moving away from human body and auditory phenomena did abolish this self-stabilising effect that we call instrumentality or 'music performance'. A self-referential implicitness makes the performativity of music a formula that resists, restores and reformulates itself in all kinds of (musical) contexts. Therefore the act of playing music represents a consistent 'dramaturgical vessel' that is a popular target for attempts to deconstruct, imitate, emulate and fictionalise. Despite the various outcomes and complex circumstances that came to be applied and accepted in both, avant-garde and mainstream cultures; still, a somewhat 'romantic' understanding of musical performance remains as the normative blueprint. A blueprint that is based on a strong foundation: Not only was the

translation of movement energy into sonic energy a requirement for music to happen for centuries; also our cognitive patterns prefer and (re-)produce this 'romantic' and analogue design. Within this phenomenological axiom, it is much more difficult to draw a line between the discrete 'nucleus of music-playing' and its bare surrounding. Actively blurring this line gives the possibilities to understand the staging of music as a communicative, creative practice that is embedded in an ecological environment; a *wayfinding* or *sonic reading*.

While 'music-making' and 'music-playing' have emancipated themselves from instruments and musicians, I found that in return this integrates the human body with new functions and relations of music activity. The performer becomes a companion of sound while making 'residual movements', a mediator between virtual and actual spaces, a target of machine listening, a mixing console with legs, a damping material, an actant in networks, a penetrator of room resonance, a presenter of magical tricks, and a sensing being that must orientate itself in the given environment. This thesis thereby points out the multitude of how human bodies gain access, relate and redefine music; how they vanish and reappear in alternative forms, fictions and agencies.

The works of my portfolio provide a glimpse into the spectrum of these new functions and relations. In the works *kaktus firmus* (2020) and *Ritournelle* (2019) the body sets out a self-stabilisation via the procedure of the 'ritournelle'. In *Bias Dialogs* (2019) and *All Watched Over by Machines of Loving Grace* (2021) the performative actions re-localise the loudspeaker's virtual space with effects of immersion, presence and imagination. Taking advantage of the freedom to fully 'choreograph' the music-playing leads to a 'magical design' in *The Fountain* (2023) and suggests to further embrace the narrational potentials of digital music interfaces. The making of *Mixed Feelings* (2021) probes the sonic agency of materiality on a tightrope between un-intentional meditation and theatrical context. By turning towards music for different 'perception styles', *A Singthing* (2021) lays bare the intersensory multiplicity of music and overcomes the dialectic of 'absolute music' and 'the extramusical'.

Following up upon these assessments, my ambition for future works is to pointedly address the bodily embedding and human situatedness within the compositional act. For my solo works, the undertaking of this thesis made me eager to elaborate the means of orientation and communication in music performances. Following the examination of the 'extramusical' aspects, I would like to consider what could be a *concert version* of some of my works. Thereby, I wish to further differentiate the function of non-acoustic elements and movement in my work, strengthening their agency in the composition. In doing so, I am willing to establish a kind of 'digital chamber music' in my future solo works. With loudspeakers, microphones and all techniques of the contemporary (mobile) studio, I further want to explore and portray music as an act of communication that greatly depends on context, knowledge and recognition.

With regard to my music theatre works, the thesis helped me to understand better and address more accurately the whole complex of sensoriality that is often stressed in the music culture. I am confident that upcoming activities of my collective *[in]operabilities* will profit from this reflection. Since the collective's work is generating increased resonance, not only in the arts, but also in

musicology and music education, future publications are most likely to follow. Such further publishing activities must include a multi-perspective approach from the whole team.

Music is an embodied practice: the physical manifestations of music (instruments, scores, records) need and produce human activity. These activities re-inform, distort, and affect the sonic manifestations, and vice versa. To 'perform around music' sets out new affordances and potentials of composition and sonic creation that are further worth tracing with thoughtfulness, creativity, and fascination.

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