The Listening Body:
Sound and the Sensory Apprehension of Movement

By

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Abstract

Through the Master of Fine Arts program at Emily Carr University of Art + Design my work has focused on the mediated moving body as my research investigates the concept of embodiment for joy, self-awareness, and self-reflexivity. Art is an ideal vehicle to explore different ways of knowing, beyond cognition, by encouraging *feeling* through aesthetic affect. I came into the MFA program with professional experience in film and videography and a background in the performing arts, which influences how I approach an audience of viewers and listeners. A significant development to my practice has been the use of sound as material, working with its illusory potential, and depicting the presence of the moving body through experimental processes and makeshift sound installations. My thesis research is driven by a desire to understand, through experience; sensory perception, embodiment, the palpability of human presence through sound, and how to apprehend features of the world by listening and generating a felt sense of the physical body in space.

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Introduction

My work aims to create a novel sensory experience where sound, image, and movement converge. My immersive installations feature spatial sound and projected imagery for an embodied experience of the work through multi-sensory stimulation and by generating an awareness of the body in space through proprioception. In bridging the disciplines of sound, video, and dance I integrate the conventions of these media and engage in cross-disciplinary improvisation to generate new bodily knowledge. With research into perception and embodiment the experience of my work is that of listening to see, seeing to feel, and feeling to hear. It is through movement that I create a physical presence out of the immaterial.

The subject of my work is the body, which is materially absent save for the resonant sensation of its physical presence in sound and imagery. My embodied improvisation produces sound and projections which may be familiar to the body in abstraction. This process invites the audience to situate within the work, allowing individual perspective and lived experience to temper the work in the absence of visual representation. I have taken this time to consider my artistic responsibility in working with the body as subject and the implications of accessing perception on a corporeal level.

I address perception through synesthetic experiences with sound, video, and dance. The sound focuses on vibrational experience and spatial composition, as they relate to the body. The work is not meant to be considered music in the sense of a harmonious relational arrangement. Video is used as a means of recording movement that is then projected as abstract moving image or light. I use the term *movement* rather than *dance* to highlight its transference onto different media. Dance is a discipline which explores codified movement, interpretation, and improvisation as the site of expression and performative communication. The work described in this thesis uses movement to generate ideas, facilitate sensation, and bring attention to the present moment. I create movement with sound and light and incite a sensation of dancing in an audiencing body; the work represents the effects of dance but not the act of dance itself.

I begin this document with a positionality statement that outlines the path that brought me to this particular juncture of practices. I acknowledge that the way I am working is based on my lived experience and a desire to reach audiences individually and intimately, and to invite them to feel and think differently. I then provide context for my work from artistic influences: Susan Kozel, La Monte Young, and jamilah malika abu bakare, whose practices are important in redefining the mediums they work with. A summary of the fundamental concepts underlying my current practice follows, where I chart my conceptual development through select projects. The theories that support my explorations are outlined in the Methodology section and illustrate how I conduct my research and in turn, process the results through time-based installations. Then, with a close read of my thesis exhibition installation I situate the results of my exploration within an immersive installation. I conclude this thesis support document by considering how my thesis research will inform my evolving independent practice.

Positionality Statement

Mine is an evolving multi-sensory practice based on embodiment. It is a practice that makes me feel most connected to myself and to others. Movement, for me, is an act of self-knowing. I aim to make this accessible by focusing on the bodily experience. My artistic research explores movement and cognition through embodiment as a means of encouraging new understanding and self-awareness. I feel it most pertinent to explore my findings through immersive installation, and see this research as urgent and necessary considering the prevalence of individualism, distrust in difference, and the ubiquity of unaddressed issues perpetuated by a screen-centred world. This work has the capacity to enhance empathic knowledge by creating a chance to feel, differently, together.

My dance training began as the sole task of looking like someone else as my early training was heavily mimetic. I was keenly observant and I emulated with a precision that I was praised for, but this was a decidedly outside-in process. My sense of self eroded as I opted to see myself through the eyes of others. I spent my adolescence in front of a mirror, working hard to be allowed more dance by way of more training. I attended a performing arts high school then performed with a pre-professional company and completed an undergraduate degree in dance. This was the crux of it: I would have moments of blissful exertion and self-affirming physicality and then correct myself in the mirror. Dance training routinely established that I wasn't the arbiter of what was right for my body, and that I had to assess myself from an outside perspective. To cite French psychoanalyst, Jacques Lacan's "Mirror Stage," this was the epitome of the "ideal I," being outside of what felt like *me*. I am thankful that my undergraduate degree in dance fostered artistry over commercial virtuosity. I discovered improvisation as composition and contemplation and was able to find agency in my moving body. Improvised movement felt a lot like dream-interpretation; I didn't know where anything came from but I knew it was a part of me, and it felt like magic. I learned to be present and I started feeling instead of looking. Anytime I get too focused on seeing myself from the outside I remind myself to feel my body. *Looking* for approval is the slippery slope of vision for me.

I have made it a practice to improvise in all disciplines, which is how I have arrived at the use of new technology, workflows, and materials. As a result, my practice spans several disciplines and diverges within the conventions of filmmaking, sound design, and dance. A dance practice doesn't typically develop into a media practice, but these technologies have become a tool with which I extend my body, sensing and moving beyond my corporeal limitations.

Working as a filmmaker I distil an intimate perspective from my awareness of the bodies involved: mine, the subject on screen, and the future audience. As an insider to the world of performance, I use my access to refocus the attention on other aspects of a moving body: not virtuosity but choice-making and visceral contemplation. With my camera I commit to capturing the perspective of being situated in the action, and my physical engagement can be felt by the audience as I run, lean-in, lunge, and steadily track a moving and unpredictable body. It was in filmmaking that I first realised the effect of kinesthetic empathy; that an audience is moved when witnessing movement.

Branching from vision, I focused my early thesis research on perception which led me to abstractions of the body and of movement–one where visual representation wouldn't distract from or distort the experience. I aimed to remove the condition of analysis in my work and found that sonic stimulus disarmed my analytical eye so that I could receive other profound sensory information. This is what led me to work with sound.

Within an academic context, the fragility of the visual is highlighted through optical illusions, visual bias, and the disproportionate value of sight over our other senses. I have learned that one way of seeing defines only one way of living, and that the inability to see, as in represent, a way of life which deviates from the norm is a matter of life and death. As Research Assistant with the Critical Literacies project, I began to unpack the hierarchy of language, recognizing it as simply one form of intelligence. I drew parallels between the power of the written word and the ways that education divides people. So often language is our only voice and so seldom is visual representation unequivocal**.**

Work without pressure to determine exactly what is to be seen or heard, as is the case with abstract art, facilitates a heightened awareness that makes sensation more available. Sound, like video, can offer an experience that we may never be able to enact physically by envisioning it, or in the case of sound: by imagining it. Later in my research the term for this experience would be to "virtualize." Physical embodiment is not reserved for the moving able-body. It is this point that most demonstrates my enthusiasm for creating work for the senses: perception of sensation and actual physical sensation have the same impact on the body. For example, Autonomous Sensory Meridian Response (ASMR) is a sensory practice where audio recordings, sometimes paired with video, depict actions which are recorded from the audiences' perspective, to create the sensation of live action. ASMR artists creates a physical sense of intimacy in the absence of proximity. A certain percentage of the population experiences physical sensations of tingling and chills when listening to ASMR. In music studies, this effect is referred to as "musical frisson" and is known to affect skin conductance and the release of dopamine (Lochte).

Appealing to the senses is my way of offering an experience that is beyond visual representation, one that is individual but shared. In creating awareness through physical attunement, I endeavour to regulate systems out of balance – the systems within me and those that govern our bodies. My work offers a chance to access alternative states through embodiment: shifting how you feel in a particular setting. Inhabiting the body in a new way can empower us to live differently within conditions that we can't control. Acting as an empathetic intermediary, I hope that I can create spaces that we share, where we can understand beyond our own circumstances.

Artistic Influences

I am regularly encountering new influences as I allow new elements of my practice to emerge. As such, this is a selection of current artists and works who have influenced recent projects. I tend towards artists who are approaching a medium differently, or seem to be asking questions similar to my own about the audience experience. Susan Kozel, La Monte Young, and jamilah malika abu bakare are three artists who inspire me to explore new methods and philosophies for perceptual work.

Susan Kozel and *Telematic Dreaming*

Fig. 1: Susan Kozel, *Telematic Dreaming*, 1994. Mixed media performance. Used by permission of Paul Sermon

Susan Kozel is a contemporary phenomenologist and professor of Philosophy, Dance and Media Technologies at the School of Art and Communication at Malmö University in Sweden. Kozel grounds larger philosophical questions about media and perception in a study of the dancing body. Kozel's most salient research considers embodiment, improvisation, and the concept of the virtual, which has helped to contextualise my process

based on my dance background. As I experiment in new media I have been encouraged by parallels between my observations and Susan Kozel's published research. I take this to be exciting coincidences produced by two embodied practices integrating technology with a choreographic mindset. I am thrilled to be led down lines of thinking similar to Kozel, years later.

Kozel writes about materiality within virtual spaces as she recounts her experience performing in Paul Sermon's *Telematic Dreaming* as part of the 1994 *I + the Other: dignity for all, reflections on humanity* contemporary art in central Amsterdam exhibition. *Telematic Dreaming* is a projected performance in which Kozel's physical body is filmed off-site, then projected, in real time, into a gallery space, creating the illusion of an interactive performance, once removed. The performance takes place on the surface of a bed. An exhibition-bed identical to the one the real Susan Kozel is performing upon was installed in the gallery beneath the beam of her projected image. The action upon the exhibition-bed is recorded and displayed on three video screens above and on either side of Kozel's offsite bed-stage. The effect is one of a two-dimensional dance performance occurring on a bed, where audiences are encouraged to join Kozel's image. Kozel, in-turn, improvises with the audience members by responding to the view on her monitors.

Fig. 2: Susan Kozel, *Telematic Dreaming*, 1994. Mixed media performance. Used by permission of Paul Sermon

The *Telematic Dreaming* exhibit lasted four weeks. The entire length of the exhibit was recorded, as were all of the rehearsals in which Kozel proposed ideas to her future self to review. Not only was this a lengthy hyper-reflective exercise, it is also examining physical presence and the sense of touch in virtual space. Kozel explains

> This piece is significant for revealing, in an accessible way, that basic human qualities such as touch, trust, vulnerability, pain, and embodiment are not lost when people engage with each other through technologies: we just need an appropriate methodological framework in order to see and validate this" (Kozel 89)

Kozel details the accounts of audience members who were deeply affected by the piece and its intimate exchanges, agreeing that the experience was incredibly physical and sensual, despite being mediated and physically removed. *Telematic Dreaming* helps to demonstrate a different kind of interaction, a curated encounter in which the absence of the live encounter leaves room for a more poetic relationship. It also affirmed my theory that the suggestion of sensation might actually be palpable in a different way.

La Monte Young and *Dream House*

La Monte Young today is deemed a "minimal composer" but his work challenged the popular conception of music during the fluxus art movement. Consisting mostly of long-held tones and drones, his then compositions now resemble contemporary sound art and installation. Young, a prolific musician, regarded music as something to stay with, to steep in, and dedicated his practice to the exacting science of sound waves and refining auditory perception. Young explains that the tones in *Trio for Strings* were "suspended in air to allow examination and contemplation" and his famous work *Well-Tuned Piano* is just over five and a half hours long, effectively defamiliarizing each note through a durational performance (Tannenbaum).

With his wife Marian Zazeela, La Monte Young created a sound and light installation called *Dream House*. In its various iterations, *Dream House* exists as a room or space, filled with rich pink light, outfitted with speakers producing slightly varied sine-wave tones. Positioned meticulously throughout the room, the speakers create unusual sound wave interactions, which reverberate based on the position of the listener. Using a special synthesiser, the sine-waves are only microtonal variations of each other, meaning they do not harmonise typically. Being so close in tonal range causes a "beating" effect, which creates a bouncing of sound or an additional vibrating tone changing in intensity based on how, and where, a person moves through the installation. The unconventional spatial harmonising is the main feature of the work, where audience members hear the interacting of sound waves and sense the implication of their own movement through space.

https://www.melafoundation.org/dream02.htm

Fig. 3: La Monte Young and Marian Zazeela, *Dream House*, 275 Church Street, New York 1993. Installation.

Figure removed due to copyright restrictions. The information removed is a snapshot of the Dream House *installation featured on the MELA Foundation Website. The image includes an empty room filled with purple lighting, light sculptures, and three vertical windows.*

Making the immaterial perceptible is what makes *Dream House* relevant still today. The concept composition is revealed through participation. Young invites the audience to engage differently. Attuned to the sensation of sound waves and the length of time spent with a renewed perception of sound, he makes work for the body in a way that I admire. Using sound as material, I want to bring awareness to the body and allow for a reflective state during a time-based concept. Instead of the audience moving through my installations, I want to create sounds that depict movement, sometimes creating the sensation of self-motion and other times inviting a kinesthetic projection of movement onto the source of sound. I ask people to slow down to sense the environment and in turn, their own body.

Young studied North Indian music, a melodic system and tradition that believes in healing frequencies. The depth of his consideration of a few select tones marks a paradigm shift. People would spend hours in *Dream House*, using it to meditate, seeking transcendence within the immersive installation. I maintain that the physical experience of sound situates the listener in a profound way. Centering each audience member as the subject of my work recognizes individual perspectives and allows a transition to a more open-minded, receptive state. *Dream House* makes evident the unseen transmittance in space and between people which is affected by our actions, calling for a more conscientious engagement with the world.

I look to the simplicity in the design of *Dream House* where the complexity of the concept lies in the act of listening. Over the years, and as technology advances, the same basic concept remains integral. There is no way to adapt the sound wave interaction virtually or for headphones. It is necessitated by space and the moving body.

jamilah malika abu-bakare and *listen to Black women*

Also working with sound, jamilah malika abu-bakare demonstrates a transparent relationship to technology that favours the message over mystique. Her interdisciplinary practice prioritises care and community, centering the lives and bodies of black women (bakare). bakare's interdisciplinary practice prioritises listening over looking as she seeks justice through art-making. I was introduced to bakare's work at Emily Carr's *Resonance* speaker series, in front of two large black screens which read "sound as freedom," the title of her lecture. Exploring the physiological effects of sound on the body, I've come to understand that knowing how to feel good allows for a certain type of freedom. Self-knowing is a step towards the ability to be, and do, whatever brings joy and pleasure. bakare's practice resonates with me on several levels; the way she considers representation and collective healing through art-making, and her approach to working with technology.

In this talk, bakare spoke of the gate-keeping of technology not only by sex, race, and class but of the developing art forms themselves, indicating that the expectation for high-level production and innovation only narrows the scope of voices represented. It's the inclusivity of her practice, which includes anti-oppression as well as an emerging-artist initiative that truly beckons other makers. What makes bakare's work accessible is its forthright form, similar to La Monte Young. The provisional use of technology, purely for recording and playback, places more importance on the act of listening than demonstrating mastery or technique. bakare goes as far as to say that the low-tech and low-fidelity of both her sound and video works help to underline the priorities of her practice demonstrating a refusal of the commodification of media practices.

abu-bakare's work makes way for others through an initiative called *Aural Alterities,* which resources underrepresented emerging sound artists. jamilah malika abu-bakare supports the successes of female-identifying Black artists through collaboration as they unite around the shared experience of representation. The joy and camaraderie that can be felt – and generated – in shared moments makes me curious about how pleasure can be

taken up through different senses, and transferred between people by modes of communication that we are not consciously aware of.

jamilah malika abu-bakare's interdisciplinary practice directly confronts visibility and representation. *Listen to Black Women (again*) is a video comprised only of sound. The audience must stare at a black screen while a collage of spoken sounds assembles sensorially, feeding back on itself, reordering, and layering. "To be black enough" repeats in stereo, moving from right to left until it is met with "just as I am." These words hang in the air with a renewed resistance. I wonder, what is Black enough? What does "just as I am" look like? We aren't allowed such conclusions. A cacophony of the line "to be addressed and recognized and appreciated and respected" then tumbles out over itself again and again. This time the words overlap as if to signify the accumulation of these requests unmet. In this piece, to *listen* to Black women is to oblige.

https://vimeo.com/530585670

Fig. 4: jamilah malika abu bakare, *listen to Black women*. Sound Art. Video Excerpt.

Figure removed due to copyright restrictions. The information removed is a video excerpt of listen to Black women*, a sound file played as a video showing only a black screen.*

My exploration of sound has always been based in personal discovery. Early in my research I determined that sight, as the sense that the majority of the population relies on most, has more to do with perception and the significance of information retrieved than it does with the function of our eyes. jamilah malika abu-bakare seems to share the same conviction that the visual is mired in commerce, patriarchy, and colonial values. The real issue of the representation of bodies for me is a focus on the "other" that negates self-reflection and I trace this problem back to the prevalence of ocularcentrism in our society. The act of looking is an inherently external exercise: it focuses on that which is outside of the self. Focusing on a lived experience is where self-reflexivity begins and the embodiment of sound enables this. The same way the listener is freed from a visually prescriptive

experience, bakare insists the maker is freed from objectification. The research I do on the body can be seen as a metaphor for collective healing. While my work doesn't directly address issues of race, I am working against judgement based on difference in perspectives. I honour the individual body as it grounds my explorations in personal experience.

bakare gives words dimension in space and time in the same way La Monte Young insisted we contemplate individual tones: in order to feel their weight. Letting voices exist outside the context of identity, steeped in subtext, the sucking of teeth, deep-sighs and candid disclosures hold more significance as a steady, repeating tempo of discourse than performed on their own. Unlike music which creates harmonies, the listener can identify the individual parts that make up *Listen to Black Women (again)*.

Refusing illusion, I seek transparency when working with sound and technology because I respect the diversity of perspectives within the audience. The work exists within each audience member, not outside of them. This is also what drew me to sound in the first place: the undeniably personal experience. What I appreciate most about the works of Susan Kozel, La Monte Young, and jamilah malika abu bakare is their ability to include the audience experience into the work, in different ways.

~

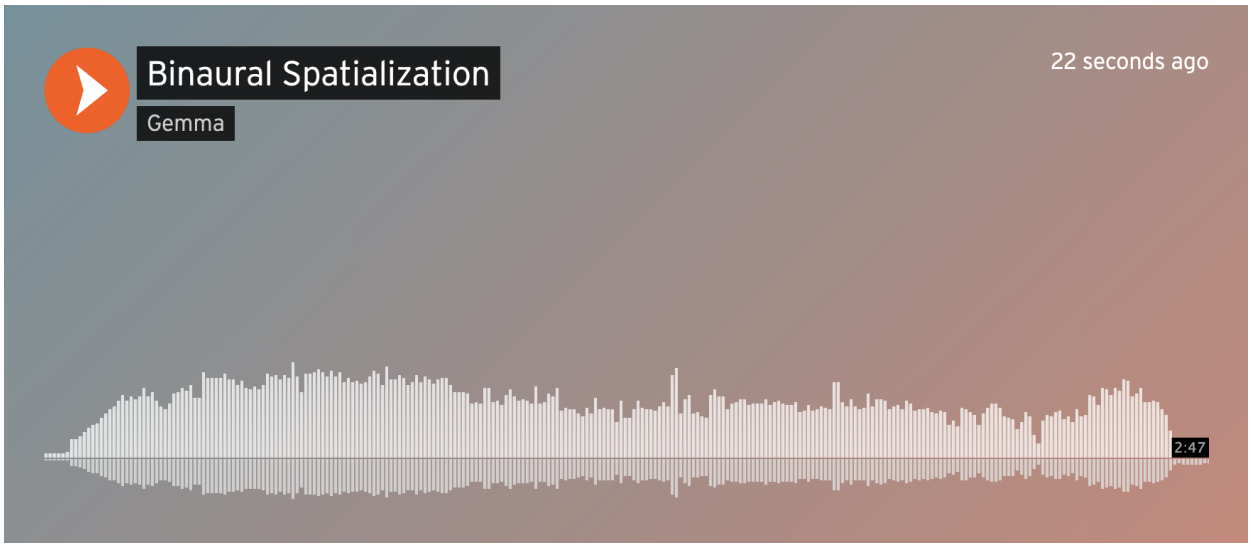
To clarify the relationship between my artistic influences, research, and methodology the next section introduces concepts that have been core to my thesis research.

Research Methods + Observations are included in Appendix I

Core Concepts

Sound Perceived as a Moving Material Form

I am working with sound as a moving material form. As part of the practice-based research component of this thesis, I have discovered two ways to make the movement of sound perceptible: through recording a single, static sound source while wearing in-ear binaural microphones as I move my body around the sound, and through the creation of Sound Shadows. I aim to create the perception of movement in space around the body or the sensation of self-motion. Both of these techniques encourage the listener to perceive sound and space with proprioception (the perceptual sense that situates the body), which in turn activates the body through kinesthetic empathy. By refining my aesthetic capabilities with sound, I am practising theories of embodiment through auditory manipulation and mediated sensation.



https://soundcloud.com/user-694749249/embodied-spatialization?utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing

Fig. 5: Gemma Crowe, *Binaural Spatialization.* Sound Excerpt.

In a lecture on multisensory self-motion perception in Virtual Reality, Behrang Keshavarz, assistant professor of psychology at Ryerson University, discusses the concept of vection which creates "the sensation of self-motion in the absence of actual motion," and specifically notes that although vection is typically experienced through the visual sense, there is potential for auditory vection (Behrang).

As I physically inhabit the recording of sound defined by all the expression and constraints of a human body, I am producing a specific corporeal intention which I hope lands in the body of the listener as a more nuanced experience than what could be developed through spatial sound editing. I am proposing that in depicting dynamic material form, sound can potentially reanimate the moving body in space. The aesthetic specificity of movement and sound holds the potential for auditory creations as performance and a felt sense of bodies remanifested in space. How does the body recognize movement and how can I convincingly recreate an event for the auditory senses?

Sound Shadows

I create *Sound Shadows* with a source blocking technique that uses the audible interference produced by my moving body partially obstructing the reception of sound by a recording device. This is akin to the way a body produces a shadow as it blocks light from a surface. The sound shadows are most audible as the sound waves are eclipsed by the body. The conjecture is that during playback the sound shadows could perceptually rematerialize the moving physical form that was blocking the sound during recording.

https://youtu.be/pyKKuELR5q0

Fig. 6: Gemma Crowe, *Sound Shadows.* Sound Excerpt.

Embodiment has been part of my artistic practice for some time. I grew up taking music lessons until I began dance training, where I studied an embodied musicality. The soundscapes in my film work express what I could not capture on camera. Because hearing allows for simultaneous activity, we can consume sound with different levels of engagement; our bodies can be in any orientation to the source and we can be in almost any physical or mental state and continue to listen. This allows us to connect our personal experience with what we are hearing. This connection is aided by the fact that the immaterial nature of recorded sound requires an imaginative engagement.

In the essay *Meaning-making and Embodied Cognition* in *Doing Research in Sound Design,* Stephen Roddy and Brian Bridges discuss how embodiment shapes cognitive functions like meaning-making. They write that "the meanings which we are concerned with in sound design are created at the intersection between multiple modes of perception and interaction" (33). I encourage meaning-making rather than interpretation of a predetermined meaning by engaging perception throughout the body and its multiple senses.

The embodiment of sound is most clearly demonstrated through vibration, and that of bass tones in particular, which are usually felt more powerfully than they are heard. Religious traditions or healing rituals that participate in music, singing, chanting, or sound use the affective qualities of vibration as a means of transcendence and worship. Outside of faith practices people commonly use music to change their state of mind. Binaural music is an emerging genre designed for headphones and uses the separate audio tracks in each ear to achieve "brainwave synchronisation" or "entrainment" which synchronises brainwave frequencies with the music to achieve a state of relaxation or focus. These diverse sound applications demonstrate more than a listening relationship.

Embodiment – treating something outside of ourselves as if it were our own – is the reason I create work. *Sharing Breath: Decolonizing Pedagogy* is a collection of essays

demonstrating the importance of embodiment for community, healing, self-reflexivity, and social change. Randelle Nixon and Katie MacDonald in the essay "Being Moved to Action," support the importance in *feeling* by assuring that they, "like many others, argue that rational thought does not occur through a repression or domination of our affective responses, rather; what we understand to be rational relies and draws on our bodily feelings and knowledge." *Sharing Breath: Decolonizing Pedagogy* is an account of self-knowing as a political act and empowering standpoint, and situatedness as a means of ethical engagement with difference. My artistic research seeks to allow each audience member's unique perspective. Democratising experience in this way leads to a more refined and sensitive account and can encourage change on different levels.

Audible Kinesthetic Empathy

Karen Wood's theory of kinesthetic empathy was the starting point of my research. Wood claims that watching movement spurs a visceral, kinesthetic response. The bodies of people who watch movement react as if they are performing the same movement (Wood). Barbara Tversky, a professor of psychology at Stanford University who has developed significant research on movement, cognition, and spatial thinking, builds on this with her investigation of mirror neurons and entrainment, stating that "body-to-body communication is more direct than word-to-word." (112) The sensation of physical engagement from the perception of movement is an important consideration in my work. For example, as a filmmaker moving alongside dancers and capturing their moment-to-moment decision making, I strive to give audiences a chance to feel what it is like to be in that moment.

Barbara Tversky's research on spatial thinking in her book *Mind in Motion* sparked the idea that kinesthetic empathy might be the key to embodied cognition engaged through the perception of movement. Tversky claims that "action molds perception" (23) and that "spatial thinking is the foundation of abstract thought" (163), which is essential to activities such as problem solving, creation, knowledge production, and the conceiving of possibilities. I wondered; if watching movement creates reciprocal activity in mirror neurons, then perhaps tracking the movement of sound through space might also create a kinesthetic reaction. For example, when I create a binaural audio track that seems to circle around the listener's head, the body is affected as if something really *is* flying around them. This is how I can start to offer the experience of movement without the listener having to execute it. Imagine being able to feel something without physically experiencing it. In that case, embodiment is a kind of visceral empathy.

Reflection in the Absence of Live-ness

Performance researcher Philip Auslander has conducted extensive research into the concept of "live-ness" which has helped me to clarify the role of recorded material. Auslander deems anything that is mechanically amplified to be mediated, and therefore not live. He notes an obsession with intimacy in the zoomed-in, blown-up representations of television personalities and live performers, effectively making us feel as though we might be able to attain what we want instantaneously and without real-life effort. I agree that screens and representations of intimacy pervade most of our lives and generate a superficial sense of knowing, however; observing others encourages empathy through which we may understand each other by learning about ourselves. Inciting an empathic response is an effective marketing strategy, it can be manipulative and addicting, but bringing things into closer-view can also enable a perspective which we may not have access to, for reasons beyond our control.

Beyond providing access, mediated live-ness provides new ground for interpretation. What could be gained by allowing the audience to build a relationship with sound and imagery that isn't quite so fleeting? I am interested in *presence* and how the current moment can be affected by a layering of events – through the use of recorded audio or visual material. Having studied live performance, I have a deep appreciation for its ephemerality but the act of gathering in space and spending time remains in my work. I now work without a sense of immediacy, staying with the sensation distilled in the removal of live-ness. It is Philip Auslander's rigorous analysis that highlights the aspects of live-ness that are most important to my current work.

My departure from live-ness allows me to explore virtual experience and telepresence; enabling a connection to another place, or time, to influence the current experience. For the purpose of a philosophical approach, virtual then means to invite possibilities which lie outside of the immediate physical reality.

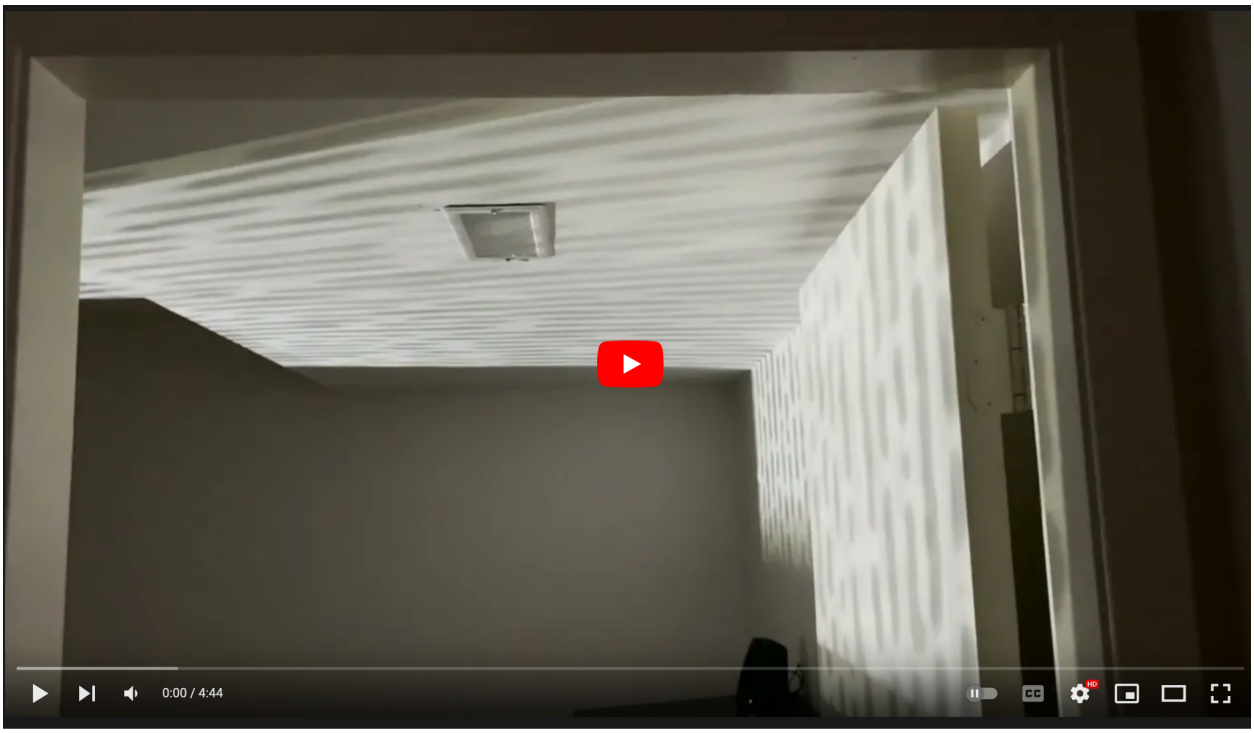
~

This research encourages me to further explore sound and perception within multimedia installations. In the section that follows I will briefly describe the projects which I have developed through artistic research.

Artistic Research and Works Created

Breathing Room: Using Space as a Time-Based Medium

Following discussions and research into embodied process, the abstraction of physiological process, and the fragility of vision, I created *Breathing Room* – a time-based installation featuring sound and video projections which represent breath and the act of sharing. *Breathing Room* was further developed as part of Yard Space Gallery's Fall exhibition. I first questioned the representation of the human body with this work. I considered how it inevitably tinges experience: at best signalling belonging (from the familiarity of my image) and at worst equating my body and my identity with a template for the experience. I wondered how the interpretation of a white female subject was inhibiting an individual felt-sense. What if there was no ideal "I" reflected back?



https://youtu.be/TCUp0m1Xxvs

Fig. 7: Gemma Crowe, *Breathing Room*, 2021. Yard Space Gallery. Video Documentation

Installing *Breathing Room* in the vacant basement suite of Yard Space Gallery I was able to express the abundance of immaterial presence in this work by projecting video onto windows and reflective surfaces where they could expand in space. This work features two videos of abstracted data representing the breath between words in an audio recording of myself speaking. A soundtrack of just the breath between these words is heard along with individual piano notes sequenced between the rooms, moving autonomously through the basement. A video cropped to reveal only my arms intermittently extending out from my chest, towards the audience, fills the basement living room space. This was the movement enacted while recording the spoken audio; personal thoughts, recorded with the intention to share with the audience without ever uttering a word.

The projected imagery communicated through what was withheld. An arm outstretched and unmet proposed a dissonance in the room while the moving images which scrolled with data sustained an infinite cycle. I wondered how audiences would experience everything that was presented, but not physically present, and how much removal might actually encourage the audience to project something of their own into the space. This was a step towards understanding the impact of mediated live-ness through abstract performance elements.

The research behind *Breathing Room* explored breathwork and its physiological effects on the body. I was interested in how the consistent breath soundtrack would produce an empathetic response. Speaking is an extended process of exhalation and breath in the space between sentiments, where what we say lands and we prepare ourselves to share. What happens to us physically when we share our stories? How does this affect space? This work was the beginning of my exploration into the affective potential of the kinesphere.

Fig. 8: Gemma Crowe, *Breathing Room*, 2021. Yard Space Gallery. Installation Documentation

Hearing and Site within Spatial Sound Installation *How Do You Here Me?*

To hear something is to encounter it physically, but to see something is to be removed from it, at a distance. *How Do You Here Me?* explores the physical presence of sound and offers a felt sense of proximity where it does not exist materially. The work was produced during a month-long residency at Lobe Studio in Vancouver, one of three spatial sound studios in the world using 4DSOUND technology. The sophisticated sound system and spatialization capabilities fostered an intensive study of sound, space, and sensation in an effort to appreciate and refine a sensitivity to the tangible world of vibrations. The final product was a 50-minute spatial sound installation with four distinct movements which make use of the illusory potential of sound to create new spaces and places to ponder.

Although *How Do You Here Me?* featured significant musical sections, it was not meant to be experienced as music but as an installation accessed through auditory cues. One section which played 20 minutes of recorded humming would consistently blur and distort my estimation of time and physical orientation. In a questionnaire sent to audiences following each showcase of the work, audiences shared that they felt relaxed yet invigorated and this point in the piece conjured memories and visuals. The humming converged and diverged slowly in space, harmonising at times, beating at others. The sound began to feel like terrain and I wonder if the act of humming was internalised while listening. The consistent vibration in the humming, both encouraged a release of tension but also communicated a sense of intimacy in the recognition of human voice, gentle and at close range.

In *Embodied Music Cognition and Mediation Technology,* Marc Leman discusses the difference between the first person (cerebral) and second person (corporeal) musical articulation (77). My work does not address musical elements as they relate to musical theory but rather as they relate to corporeal articulation. Leman goes on to determine that corporeal intentionality is based on a relationship between action and perception which

> turns the physical energies of music into an imaginary world of objects having qualities, valences, goals, and intentions, and vice versa. [...] The essence of

> corporeal intentionality is the articulation of moving sonic forms, with the emphasis on movement in relation to behavioural resonances of the human body (84).

By creating sound objects and then designating their pathways and movement quality at Lobe Studio I began to feel the effect of spatial sound on my body. The physical sensations almost redefined live-ness as I felt vibration as an embodied action, producing a temporary, tangible effect, in the moment. Leman remarks on this bodily response to sound stimulus by specifying that "music is not another human subject, but it provides 'moving sonic forms' which, through corporeal articulations, are associated with our actions. In that sense, music can be considered a virtual social agent whose actions can be emulated" (92).

Reproducing physical presence requires an ability to discern certain bodily qualities, such as; the approach to movement. With special attention paid to how the sound was moving, using the doppler effect and convolution resonance I worked to choreograph dynamic movement of sound. My experience at Lobe left me wondering by what other means embodied experiences could be shared, and made communal.

https://soundcloud.com/user-694749249/how-do-you-here-me-excerpt?utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing

Fig. 9: Gemma Crowe, *How Do You Here Me?* 2021. 4DSOUND. Binaural Recording: Sound Excerpt

360 Degree Sound Shadows in *the Presence in my Absence*

My immersive spatial sound installation *the Presence in my Absence* uses white noise as sonic, spatialized, perceptible material. The white noise acts as a physical structure to block out other sounds and to help engage the physical sensation of sound. The white noise I use has evolved from the sound of my own breath recorded and looped–to create a higher frequency *blue*-noise–and is spatialized using five Genelec Speakers. *the Presence in my Absence* was installed in a dark room with five speakers on stands surrounding the audience. Layers of breath circulated through the speakers in the room, accumulating to a long, sustained exhale, output evenly throughout the space.

Instead of hearing white noise we *feel* it and blue-noise creates the sensation of pressure in the ears, which is most noticeable when it is momentarily absent in one spot. Moving my body through the space during the recording process I created sound shadows by momentarily blocking the blue-noise between the speaker and the microphone. Sound periodically drops out of each of the speakers in the installation, re-enacting the movement producing the sound shadows. Audience members recall an initial confusion, questioning what they were hearing (or not hearing). The sequencing of the sound shadows across the speakers in the room is intended to indicate my moving physical form, similar to what would be felt if my tangible body was moving in the room, passing in front of the speakers and blocking the sound.

The creation of 360-degree sound shadows involved setting up five identical microphones in a circle, surrounding five outward-facing speakers in the centre that were playing back the blue-noise towards the microphones. I moved my body around the circle, improvising with pathways and approaching each microphone with the intention of reaching my future audience. Through this process I both sensed and created the shift in sonic pressure, responding to, and experimenting with the dynamics of different movements and approaches. I performed my movements as if the recording equipment were my audience, creating an audible performance for them as they tracked the shadows my body left in the consistent sound. The setup is simply reverse engineering the

experience: what acts as playback in the recording process becomes the audience perspective; the structures recording sound are *producing* sound in the final piece.

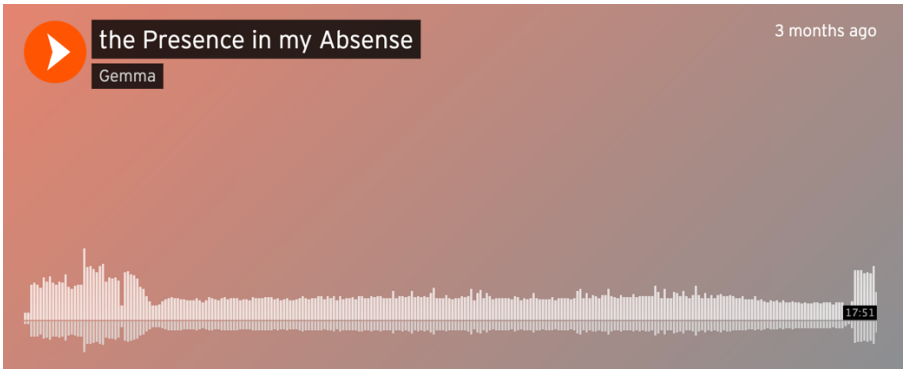
https://youtu.be/0mQppez0Ogo

Fig. 10: Gemma Crowe, *the Presence in my Absence* 2021. Process Documentation. Video Excerpt.

In *Sound Theory, Sound Practice* Rick Altman addresses the failure of language to differentiate the quality of sound – the naming of sound is based on its production rather than its consumption (19). I think this limits our evaluation of sonic experience. In a class critique of *the Presence in my Absence* my classmates had difficulty articulating their experience without the words to describe the change in sound and only the potential implications of what had transpired: they had lost hearing in one ear, something had gone wrong in one speaker, or that something was blocking the sound. Altman explains that "through the ear's ability to sense not only pressure but the rate of changes in pressure as well, we are able to measure even minute differences in the sound envelope" (21). This project positions the scenario which caused the original interference as the explanation for the experienced disturbance. It is the bodily experience of audible interference in sound

shadows that affirms my exploration of embodiment as an important element of sound reception, because many of us can sense shifts in sound better than we can qualify them.

Fig. 11: Gemma Crowe, *the Presence in my Absence* 2021. Installation View



https://soundcloud.com/user-694749249/the-presence-in-my-absense?utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing

Fig. 12: Gemma Crowe, *the Presence in my Absence* 2021. Sound Excerpt.

Methodology

Technology

↓

Improvisation ⇀ Movement ⇀ Perception ⇀ Embodiment

↑

Virtual

My methodology incorporates my body into the research and the making. I use recording and playback technology to encourage reflection, by making the audience aware of their own perception. My process is cyclical but evolving as I create through reflection: layering recorded material using the medium of sound, video, and movement. I am developing my work in the perceptual realm and my research methodology puts myself and the audience in the same position, encouraging an awareness of our bodily state. In this section I explain how I use movement and improvisation to create embodiment as I study perception, I also outline how technology supports the experience of my work, and how the concept of the virtual might help to articulate my sound experimentation.

Practice-Based, Embodied Research

Shifting much of my focus to sound research, I engaged in a range of exploratory activities and sound experiments. The techniques I use involve analogue-adjacent activities which make use of my moving body to physically manipulate and record sound for a nearly acousmatic presentation.

I began by trying to translate the sensation of spinning to the listener by placing their perspective, the Roland 26 recording device, in the seat of a spinning office chair with a set of stereo speakers playing a “chimes” sample nearby. I then discovered the doppler effect and its effect on the perception of speed as well as the location of sound by moving a

sound source towards and away from my ear, then a recording device. I found the doppler effect to be particularly responsive to a change in the quality of my movement. I listened live through headphones connected to the recording device and found that I could vary the pitch with a subtle increase or decrease in speed and at certain points in space. Refining the specific pitch modulation I desired was an act of precise movement that I reproduced through muscle memory rather than adjusting based on auditory feedback. I use different sounds and musical samples throughout these trials and found that certain tones and harmonies compounded the effect. The aesthetic and cultural associations with major and minor chords made certain movements more sinister and others, playful.

I was also fascinated by the change in sound as I travelled from place to place. I learned that a technique called Convolution Resonance works with resonating sound waves to create realistic sound environments. I was taken by how the architecture I moved through while recording could be felt in the recordings in such a way that I could describe the feel of the space, even if I couldn't properly locate it. This informed my exploration of ASMR techniques and how I might intensify the experience by using binaural microphones.

I arrived at sound shadows and spatial sound for motion-perception (using binaural and ambisonic microphones as well as Lobe's 4DSOUND system) as the most compelling research concepts. Through these activities I realised that sound is an indicator of movement and can depict the conditions of movement. While I arrived at these discoveries through hours of exploration, my findings are affirmed through musicologist Eric F. Clarke's articulations about the effects of sound in *Ways of Seeing: An Ecological Approach to the Perception of Musical Meaning.* Clarke describes how the affect of music can be drawn from the terms of its performance: factors such as force, speed, and intention of the musician, among many other factors. "Changing patterns of attack point, timbre, dynamic, and pitch have the capacity to specify motion in a virtual space—in the same way that the continuous spatial displacements of visual edges, points of light, swirls and textures in computer animation do" (73). Clarke also cites research on the relationship between the vestibular organs, responsible for balance and orienting the body in space, and sound stimulus in depicting movement through hearing.

Improvisation as Method

I consider improvising to be knowledge generation, so when I dance, create sound, and capture movement on video I am enacting a synthesis of research from an embodied understanding. Improvising is a willingness to participate without preparation, to act intuitively. I use movement improvisation as knowledge generation and apply this to my sound research. Susan Kozel describes Maurice Merleau-Ponty's "pre-reflection" and "hyper-reflection" as bodily experiences. I think of my process as pre-reflective and the experience of my work as hyper-reflective (which includes my own experience of the work). Improvised movement and sound emerges as non-virtuosic in a pre-reflective state. I suspend judgement by thinking through my body, becoming aware of my actions after they occur and continuously acting *before* I have a chance to reflect. I am always surprised during improvisation but I cannot focus on any one moment or the process comes to a halt and the momentum is lost. Analysis is the antithesis of this kind of development. Recording improvisation is the only way to repeat it. *Layering* it is the only way to develop it. This allows me to manipulate and redistribute liveness. Immersive engagement of the senses allows for the momentary abandonment of engrained patterns of thought. In order to distil experience, I obscure perception, starting with my own.

The Art of Perception

Realising the effect that sound can have on the perception of movement in the space around us confirmed sound as the main material of my exploration. I know there is potential for greater sensitivity, and therefore understanding, in the way we absorb information from the world around us. I examine affect by initiating physiological effects on the body through hearing and vision and I used time-based approaches to sustain the act of perceiving. Kinesthetic empathy and embodiment are concepts which ground my work in perception via the body.

Susan Kozel describes phenomenology from the perspective of an artist and researcher who works with dance and technology. In her book *Closer: Performance,*

Technologies, Phenomenology, Kozel highlights the importance of lived experience and reflection in phenomenology, which

> is inclusive of a variety of experiences and not bound to a narrow and abstracted notion of truth; that it provides scope for the many dimensions of what we are as human beings to contribute to the expansion of knowledge and creation of cultural artifacts. (5)

The reason I aim to engage the senses and portray movement is because it makes us think differently. Remember, *action molds perception* (Tversky 23). I hope to offer the audience a new state of mind.

I am working from the idea that recordings can function the same way memories do, framing the experience. As I edit, I am observing and reconsidering, then reordering, decontextualizing, abstracting and reframing. This is how I break down the information, making it imperceptible as a whole, so that it may be taken up differently through the senses.

The concept of "putting thought into the world," which Barbara Tversky suggests we do using language, gesture and graphics, "allowing us to transcend the here and now" supports the notion that recorded experiences enable a type of experiential dialogue with each reproduction and reception and that this is a means of knowledge production (186). Recordings offer a state of removal from an immediate event, which welcomes interpretation, reflection, and a moment to shift from external, to a more internal sense of awareness. The difference in the way I am working with sound is that the audience must track perceived action: listening for the changing location of an invisible moving sound source requires a heightened sensitivity. Making sense of something through a collaboration of the other senses focuses attention on our relationship to the sound. I am calling this *kinesthetic projection*.

The sound and imagery I create are often ambiguous, recognizable by the senses but resisting definition. In abstraction we create our own meaning–much the same way that we note pathways and patterns in space by simply tracking movement. It is this state that allows a different kind of engagement. Acknowledging that a prescriptive encounter will incite conditioned reactivity, my research investigates the repatterning of perception for a change in physical state.

The Necessity of Technology

It is important to note that my work is not *generated* by technology though it is recorded and played back using various software and equipment. The recording process is essential in communicating nuanced work that could only be produced by and read by a body. Presenting my work using audio technology is the point where the research is embodied by others. Many people are starting to realise that our daily media affects us deeply. I use technology specifically as a way-in through channels already affectively seared into us; however, I aim to highlight the knowledge in our bodies rather than implanting a message of my own. The technologies I work with are connective, enabling communication from one body to another, and serve as an ever-changing mode of creation through which I may conceive of novel experiences.

Projecting into the Virtual

Considering perception through phenomenology and using technology as a tool, I have begun to explore the notion of "virtual" through mediated live-ness. This is helping to deepen my understanding of the way I create and how I carry out my positionality as an artist. I worked with 360 video during the summer semester, using a virtual reality camera with dance company *All Bodies Dance Project*. This experience evoked the words of Canadian philosopher Brian Massumi and Australian philosopher and feminist theorist

Elizabeth Grosz who provide a new perspective on what I consider to be a virtual experience. Grosz writes:

> The virtual encompasses much more than the technological: indeed, it is the condition of the possibility of technology. It is the very condition of life, and historical development, the very milieu of technological development. (12)

When I use spatial sound to carve an auditory understanding of the kinesphere surrounding our bodies, I highlight a type of virtual experience within space using technology. In *Parables for the Virtual*, Brian Massumi further explains the role of the body in the development of the virtual:

> Since the virtual is unlivable even as it happens, it can be thought of as a form of superlinear abstraction that does not obey the law of the excluded middle, that is organised differently but is inseparable from the concrete activity and expressivity of the body. The body is as immediately abstract as it is concrete; its activity and expressivity extend, as on their underside, into an incorporeal, yet perfectly real, dimension to pressing potential. (30)

Grosz and Massumi both speak of potential and possibility in the concept of the virtual. I think we accept virtual realities most willingly through video and sound because they are experiences that can easily be layered onto our current reality. I am excited about understanding the virtual as the realm of potential, and as a space we can perceptually inhabit a different, simultaneous reality. I house my research and the audiences' experience in layered, virtual space. This space is immaterial and relates closely to body of the audience; it is meant to be sensed within their own kinesphere and within the structure of a physical installation space. It is perceived as additional to the immediate tangible environment. To imagine through listening is to virtualize

Thesis Exhibition

Making Room for Resonance: a space for sonic illusion and sensation

Exploring Spatial-Tactile Sounds in a Gallery Setting

The final semester of my MFA has been dedicated to exploring the temporal dimension of sound and movement through spatial and tactile sound experiments. I have begun to truly understand that I am choreographing sound and that this composition style deals with arrangements in time and space. As such, the term "Embodied Sonic Design" has emerged as an apt description of my artistic process both in the creation of sound and the experience of it.

Movement Study

Having developed an understanding of how the movement of sound creates an embodied experience, I felt it necessary to chart exactly which movements and what sounds specifically reveal themselves together in a significant and satisfying way. For this project I am moving sound using tactile reproductions of sound, contact microphone recordings, and a spatial drawing technique. The most audio-kinesthetically discernable movement was derived through consistent repetition and were motions that could be transposed between different body parts or understood as whole-body movement. It is important that the movements were short, repeatable actions in order to be more accessible to bodies with different patterns of mobility and hearing ability. Jumping, swaying, swinging, shaking, and approaching and departing – either from the sound source or the recording device, at varied speeds – were movements that translated through sound. Once repetition of the same movement was established, specific characters of the movement and variations in quality were revealed. The static shapes I created with my body were not as interesting because they relied on an understanding of how the space was visually composed. Consistently re-establishing the shaping of my body through movement, however, enabled a better understanding of the state of my body and how it was relating to the space.

With a keen awareness of my bodily state while moving, I was careful to determine what I hoped would transfer to another body, empathetically. The movements I chose made me feel invigorated but in control. The repetition allowed me to recognize how sound was shaped by movement, and encouraged a flow state. I was pleased to be able to lose track of the execution of the movement in favour of feeling it in my body and noticing the changes in the sound. This state of simple physical engagement encourages the exploration of pleasure, leaving room for adjustments and self-determining the degree of development and duration. These movements made me feel open and receptive and I suspect that this level of autonomy can be sensed. In sharing this movement, I am inviting participation of mirror neurons, or *kinesthetic projectio*n. Kinesthetic projection considers the feeling and the bodily implications of that movement, not its representative qualities or its performative merit. The movement I am working with here can be described as "non-matrixed representation" which Philip Auslander defines as a performance "in which the performer does not embody a fictional character but 'merely carries out certain actions" (32). To a certain extent, this movement is defamiliarized as the significance is not in auditory readability but through sensory relatability.

Installation

Making Room for Resonance was installed in Emily Carr's RBC Media Gallery, a separate gallery space within the main concourse of the Michael O'Brian Exhibition Commons on the second floor of the building. Removed physically, to contain the acoustic arena (Meelberg 12) the enclosed space designates a more intimate experience. The space feels at once close, yet expansive. The light-colored carpeting extends to each wall and supports three rectangular boxes which seem to be floating above dim, warm lighting. This light highlights the fibres of the carpet in a way that resembles sand and gently illuminates the features of the room – enough to orient without bringing in visual expectations.

Artistic research for *Making Room for Resonance* developed through the fabrication of a series of sonic surfaces and resonant sound structures. The installation features four

wall panels, five square feet each, installed as one large panel and three rectangular wooden seats. Fixed to the projection wall of the gallery, normally displaying video, the wall panels occupy the focal point of the small gallery space by design. By directing audiences' attention and orienting towards this wall I offer an invitation to listen, in order to see. The wall panels are outfitted with audio transducers concealed behind the surfaces, beckoning investigation. These devices vibrate the surface of the wall to amplify sound, effectively creating a speaker out of each surface.

I use this ability to spread out the projection of sound to emphasise the movement of each sound across the surface. Choreographing the movement of the sound between each of the transducers further animates the sound as it moves across the wooden surface which stretches ten feet wide and ten feet tall. The movement of the sound emulates the movement of my body throughout the experiments: gliding gently back and fourth, swinging, jumping, shaking. The movement is virtualized on a large scale across the length of the facade, created by the wall panels and out in the space through the rectangular sound structures.

Fig. 13: Gemma Crowe, *Making Room for Resonance,* 2022. Sound Installation. Process Documentation

Fig. 14: Gemma Crowe, *Making Room for Resonance,* 2022. Sound Installation. Process Documentation

The sound work begins with recorded breathing, occurring at the height of my head, moving slowly side to side, pausing momentarily with anticipation of what is to come. The sound of fingertips grazing the surface materialise, disembodied but occurring at distinct locations across the wall panels. This contact, preserved as sonic expression, is the gesture which consistently anchors the body as both the sounding vehicle and mode of reception. Upon entering, an audience member may immediately detect a scratching sound. The consequent embodied understanding of this act is the premise for the work: knowing through the production of audible movement. The breathing sounds become louder and are drawn out to become one long sustained exhale, matching the sound frequency of blue-noise. The breathing, blue-noise and humming traces the surface, expanding the perceptual arena eventually filling the wall before seeping out into the space where the rectangular structures, made of the same birch plywood, soak it up: absorbing the blue-noise as a heavy pink-noise. These structures are outfitted with tactile bass-shakers which rumble

sequentially as the sound makes its way around the room and back up the wall. This motion perpetuates throughout the 20 minute immersive installation, which loops indeterminably. The invitation to sit or lie on the rectangular structures allows for a deeper encounter with the movement of sound as the bodies of audience absorb excess vibration. The people in the room, their positions and location, affect the expression of sound throughout the space. Sonic gestures travel through the resonant sound structures, across the surface of the wall and ring out, reflecting into areas of the room with no capacity for sound production.

My bodily presence is most distinctly conveyed by moments of recorded physical contact, using a highly sensitive contact microphone to capture the impact which is in-turn reproduced upon the same surface it was created. I perform gentle brushes on the wall which increase to sweeps, taps, and resolve in full body restful contact, leaning against the wall. I found a comforting familiarity in this sound as it resembles the sounds heard while in a state of rest, allowing the body and a turned head to yield into the floor.

The Sonic Presence

I am imbuing sound with movement qualities. All of these sounds are produced using my body and are meant to connect with the audience through spatial awareness as well as through a bodily understanding of the conditions of the soundwaves.

My artistic research with sound has been the most profound exploration of spatial thinking and how I make sense of the world through movement. My research examines proprioceptive perception and the way human bodies interpret the world through the senses. I'm asking the audience to feel movement through listening. The choice to use only sound that comes from my body is another level of embodied sonic design. As I edit the sounds I am tuning and composing variances with a virtual panner, affecting the sound in the same way movement does.

Fig. 15: Gemma Crowe, *Making Room for Resonance,* 2022. Sound Installation. RBC Media Gallery. Photo by Michael Love

Fig. 16: Gemma Crowe, *Making Room for Resonance*, 2022. Sound Installation. RBC Media Gallery

In *Sound Theory, Sound Practice* Rick Altman discusses film sound demonstrating aspects of recorded sound and the semiotics of sound perception. Altman clarifies the role of recorded sound as a representation of a sound event rather than considering it a reproduction of the sound, which not only must be established by the location of the sound reception – the same way a camera lens has a particular perspective – but also by the conditions of the recording of the event. This is where my work becomes a bodily narrative. The way we are used to receiving recorded sound puts us at the centre of the experience where we each experience a universal, singular perspective. This installation uses space to facilitate different perspectives which are determined by individual bodies, sensory capacities, spatial orientation, and timing throughout the duration of the piece.

Ultimately, I am exemplifying an internal, felt experience. This is in an effort not only to be witnessed, but to share something as it is felt. This could one day be presented as dance, with intricate movement patterns mapped onto different surfaces, apparatuses, and spatial schemes. This would require a much more sophisticated capture but I am interested in the idea of how much movement can be tracked simultaneously and at what point the motion amalgamates, amounting potentially to an entirely different form. Can movement be heard in the way a harmony of tones becomes one sound, as a chorus of action?

I had planned to make this piece shorter, one that would express all ideas within the timeframe most gallery patrons remain in a space, effectively summarising the ideas in a display rather than offering the experience. The sense of embodiment requires time to take hold and develops alongside 20 minutes of my recorded, intentional and ataractic breathing. The freedom to enter and exit the room means that each sound produced is an invitation to learn more but on the audiences' terms. The work was available on-loop for ten consecutive days and I have received many comments about audience members returning to the work several times and wishing they could stay in the space for longer. The experience of the work in the space has been described as activating and engaging but relaxing and it seems it was a place for many to seek refuge from the day's events. Had I succumbed to the pressure of a shorter, more accessible expression of these ideas I'm not sure the impact would have been as significant and the desire to pull audiences' attention

along a narrative progression fell away with this understanding. I am curious to see how this work affects an audience within a different building, would the stress-reducing experience be replaced by an invigorated one? Outside of an institution would we be able to experience something deeper than a juxtaposition to the immediate external environment? I look forward to exploring the effects of different circumstances on the work and its reception.

https://soundcloud.com/user-694749249/making-room-for-resonance-ambisonic-recording?utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing

Fig. 17: Gemma Crowe, *Making Room for Resonance*, 2022. Sound Installation. Ambisonic Recording.

https://soundcloud.com/user-694749249/making-room-for-resonance-binaural?utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing

Fig. 18: Gemma Crowe, *Making Room for Resonance*, 2022. Sound Installation. Binaural Recording.

Conclusion

I still seek to better understand the degree to which spatial sound affects different audience members and how their individual experiences might relate, but the pursuit of these answers offers new examples of sensory engagement and perception to the current research on embodiment and the senses. As I began to slant towards more philosophical research, I credit a more open contemplation to the process which my mind and body have undergone in situating, acknowledging, and sensitising my own perception. I truly believe we can live beyond our immediate condition–the here and now of our bodies–whether it is the freedom to feel or the wisdom to know beyond ourselves.

It is no surprise that these thoughts have emerged during a period of study that is completely undertaken amidst a global pandemic, a time when our here-and-now is threatening, and our body-to-body connections have failed to provide support and solace. This is also a time in my life and artistic development when I am considering the meaning of connection, and what is held in the space between people and things, geographically and temporally.

I have undergone such major shifts in this program, specifically in the mediums I work with. These shifts have helped me to identify the defining elements of my artistic practice, the ideas and beliefs that will always be part of how and why I create. In expressing my positionality I see that the variations in the ways I work come from the same exploration and research. I have begun to consider the concept of the virtual as a way to describe the experience of my work and intend to explore how understanding the term "virtual" might help articulate the layers of my current, and evolving practice.

This document has been a chance to clarify and formalise the work and the contemplation over the course of the program. What is most compelling to me about the process of thesis writing is that it is another exercise in translating an experience, to be understood in another way, this time through words. The reverse engineering of my art practice, to be taken up literally, and through analysis, has been generative and

illuminating, again feeding back into the making of the work. The irony of this process is that as much as I prioritise another way of being, sensing and embodied, the linguistic cognitive process is also fertile ground to develop ideas especially from sources outside of myself, as in traditional research. I cannot express how much the availability of community here at Emily Carr, and the richness of conversation that transpires, contributes to the synthesising of ideas between the tasks of reading, writing, formal research, and research with material exploration and creative flow. Conversation is definitely a form of hyper-reflection. Suffice it to say that a focus on other ways of knowing is simply my way of bringing balance to a world that I believe is suffering from its reliance on visual assurance and the written word as the only respectable measure of intellect. A sensorium is an escape from rules we did not make, yet must adhere to. I offer my sound and video installations as a refuge where new thoughts and ideas can take shape.

I find myself asking what will come of this new and experimental way of working? What does this look like as an independent practice? I've benefited greatly from resources provided by Emily Carr in the form of mentorship, equipment, time, space, practice, and have felt the full effect of a supportive and engaged community of artists and thinkers. How does this work continue? What resources, tangible and immaterial, will I need for further exploration of sound, light and video as a virtual corporeality? I suspect that the next phase of development will involve refining the installation of sound experiences and testing these theories in different spaces and communities. In recent residency applications I state my interest in providing a workshop or demonstration of concepts as way of engaging in dialogue with audience members to gain insight on the reception of my work. I look forward to expanding my research on audience perception in my role as New Works XR Program Manager, a position that has been secured through a MITACS grant and the Basically Good Media Lab at Emily Carr. Continuing to specifically engage with virtual experiences as artistic expression will be an opportunity to consider the artist-audience relationship on a larger scale.

To continue this research might mean to work in yet another media discipline, where consistently renegotiating the terms of a new medium stands in for the embodiment

of even more ways of sensing and being, together. I trust that everything I still want to try, everything I am still excited to discuss, read up on, and dream about are the harbingers of work yet to be realised.

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Appendix I

Research Methods + Observations

Questions	**Materials + Setup**	**Activities**	**Observations**	**Conclusion/ Results**
How does sound affect the body?	-Ableton Live -MIDI keyboard	Research into: -Music theory: chord progressions with specific emotional associations -Solfeggio Frequencies -Autonomous Sensory Meridian Response (ASMR) -Musical Frisson -Binaural music, bi-lateral stimulation, and EMDR -Experimented with tones, drones, and instruments on ableton live and sampled with different chord progressions, and different duration	-Emotional responses result from cultural and personal associations with certain sounds and harmonies. I labelled the chord progressions I liked combined with certain instruments based on their emotional resonance. Things like "mysterious ring" or "vintage sad" -Duration changed the effect. The longer notes were held the more deeply I felt their effect. A sense of anticipation for development also grew with extended duration. -Long held low tones made me feel dizzy but calm -Drones made me feel focused and creative	-There is a huge difference between the expectations of music and sound. -Sound can perhaps be a more subconscious experience because of how I was set up to relate to it, almost like a setting rather than a composition - A minimal sound experience became more visceral and sounds that referenced music, through harmonising or an indication of an overall composition, inspired a more cerebral or emotional reaction. -The musical experience was easier to put words to where and the minimal sound was harder to quantify
How does sound resonate on the body/skin?	-Lobe Spatial Sound Studio -Ableton	-I experimented with different notes and instruments and where they were resonating in my body	-I could feel higher tones in my head -The most intense sensations were ableton live's electronically	-With powerful sound playback the effects of the instruments can be felt more distinctly in different parts of my body

	live -4DSOUND		generated rolling cymbals, as a crescendo, which I felt on the top of my scalp and in my sinuses. When the cymbals stopped my mind felt particularly quiet and I felt tired -electronically generated violin notes were felt in my throat and chest -I felt xylophone and bells in my teeth -All bass sounds were distinct on my feet and in my pelvis	-There are parts of the body where certain sounds resonate more noticeably -The lower the note the lower and deeper I felt the sound. As notes went higher, they were felt higher on my body and more superficial
Affecting the body with ASMR sounds	-Two Shure SM58 microphones on stands pointing opposite directions -Card board sound "barrier" placed between them	-I recorded different sounds moving between the microphones -I also spoke softly: reading my own writings, recounting my event, I also whispered -I altered my position and distance from the microphone to see if proximity increased the effect	-The microphones were not very sensitive so the crispness of how my hands were handling objects like crinkling paper was not conveyed. I have listened to a lot of ASMR so I knew how it could sound. -Grazing the microphone created the same sound that I would hear if the headphones were touched while I was wearing them. This was very effective.	-The clarity of sounds as well as their orientation to the body created the sensation of proximity. This was especially effective with speaking because of my familiarity with the sound of the human voice at close range. The breaths between words, whistling "S's" and the sound of me swallowing represented a recognisable experience that I could feel in my body even though I knew there wasn't actually anyone speaking into my ears. I was even affected by my own voice, knowing what sounds were coming next! -I researched what microphones ASMR artists used to record their work and discovered binaural microphones

How does movement alter sound?	-Stereo speakers -Recording device	-Moving the recording device closer and farther from the speakers at varied speeds	-The quality of the approaching and departing movement of the recording device and sound source changed the pitch of the sound	I discovered that the way sound frequency changes based on the movement of the sound source is called the doppler affect. The speed and quality of the movement seem to "bend" sound frequency in different ways.
Can sound create the sensation of self-motion?	-2 sets of stereo speakers -2 recording devices -Office swivel chair	-Sitting in the chair holding the recording device pointed ahead of me. Spinning slowly, then spinning quickly. One set of speakers facing the chair, stationary. -Only one recording device, facing forward but the two stereo speakers on either side of the chair, facing in. -Two recording devices, pointing in opposite directions, on either side	-I felt the sensation of spinning, but only slightly and I felt it more in my head. -I didn't feel like I was moving with the two speakers on either side of me but I did feel disoriented and overwhelmed. I couldn't track the sound in space as easily when there were two sources which grew louder and clearer at the same time but faded in different directions. -I listened to each recording separately from the two recording devices pointed outwards and it was significantly more effective in producing a sensation of the sound source passing by my ear and I could send the spinning action. Although it felt more like the sound was circling rather than it felt like I was spinning.	-Recording sound while moving was an exciting area of research and I tested many different music samples and sounds with this set up -The idea of moving the recording device initiated many more movement experiences while the discovery of orienting the recording device in the same direction my ears would be receiving sound led me to try more movement while wearing in-ear binaural microphones.
How does the environment of the	-In-ear binaural microphon	-I wore the in-ear binaural microphones as I	-I recorded only the atmosphere of these spaces but the sounds of	-The recording environment shapes the sounds that occur within them

recording affect the sound produced?	es -Various environments	walked my neighbourhood, through my building, in hallways, stairwells, an elevator and more intimate spaces like my car, kitchen and bedroom. I walked through different architecture, public settings, wide open fields, playgrounds, and on sidewalks lining busy and residential streets.	my footsteps were an incidental sound that I didn't expect to be so prominent upon my review. The way the sound of my footsteps changed gave me the idea to see how projecting sound into different spaces would change their effect	-I wondered if I could understand the environment of recording and could I also sense the experience of my body moving through these spaces? -I was also really interested in the way sound changed as I walked by parked cars along the sidewalk. As I walked, I didn't notice perhaps because the temporary muffling of street sounds and amplifying of side walk sounds made sense with the world around me. Listening to this shift afterwards created the physical sensation of a large form (the car) next to me, "appearing" as the street sounds muffled at almost regular intervals as I walked. -Reliving this event through sound was much more profound than it was in the moment and I wondered how something "obvious" must be understood differently through sound and other senses.
How is movement within a specific environment perceived through sound?	-In-ear binaural microphones -Stereo speakers	-I set up a pair of stereo speakers playing a short sample ("vintage Sad") at the end of the hallway in my home and wore in-ear binaural	-I used the doppler effect and source-blocking to illustrate the scene: moving down a long corridor, past openings into different rooms. The creaking floor beneath me was an added bonus	-I'm finding that sound quality says a lot about the conditions of the recording; where and how it took place. The more literal the scene the easier it is to illustrate through sound

		microphones as I walked down the hallway towards the sound and walked backwards, slowly moving away from the sound.		
How is movement perceived through binaural recordings?	-In-ear binaural microphones -Stereo speakers	-I placed the speakers side by side, playing an "airy drone" sample. The speakers remained in a static position representing a fixed point in space in the soundproof recording studio. -I moved around the speakers, spinning, tilting my head side to side, and folding forward, bowing my head in front of the speakers	-Listening to the recording sounded as if this fixed point were moving, and not my body. In fact, the fixed point seemed to be travelling in the space immediately around my body in 360 degrees of space -This was very exciting to discover. I spent a lot of time exploring movements and head positions that would delineate the pathway of what now felt more like an object than sound.	-In-ear binaural microphones are able to record the individual sonic experience of the left and right ear. As I was moving, this meant that the proximity to the source of sound was different in each ear and thus produced a different sound. -The sound in the separate channels mimics the sound at a particular distance and angle experienced during recording Understanding how the doppler effect and source blocking change the quality of sound helps me to understand why it seems like the sound is moving through the 360 degrees of space around my body - but it doesn't break the illusion for me
How does source -blocking affect sound reception	-Stereo speakers -Recording device	-Setting up the speakers on one side of the recording studio and the recording device on the other I moved between the two. -I experimented	-I could definitely hear the interference my body caused between the speakers and the recording device, which was similarly all-consuming the closer I was positioned to both the speakers and the	I coined this source-blocking technique "Sound Shadows" because of the way it mimics audibly, the experience of shadows created when light is partially blocked. The absence of higher frequencies convincingly

		with moving close to the speakers and close to the recording device, then travelling between the two slowly, quickly, and on a zig-zagging pathway. I made sharp fast movements with my body and slower, more intricate shapes – all while imagining what would create the most distinct shadows if I were using *light*.	recording device. -I discovered optimal zones were between ¼ and ¾ of the distance between the two devices and the most effective movements created a distinct contrast between the sound passing directly from the speakers to the recording device and sound that was fully blocked by my body. This was achieved by simply walking a path perpendicular to the direction the sound travelled from the speakers to the recording device. I was effectively crossing the flow of sound and disturbing it and this was audible. -Movements that were more easily discernible using this source-blocking technique were motions which kept with the idea of high contrast, and played, audibly, with the idea of white space on a page. So, waving my arms, folding forward or crouching, and whole-body movement which left enough space for the sound to pass unimpeded around my body made the most distinct effect.	indicates a physical interference blocking the reception of sound from the source. This is similar to the effect of a notch filter, a technique which I later used to try to create sounds shadows through editing software. The effect works but doesn't create the same complexity that the moving body does. It sounds like something moving between the sound source and its reception, but doesn't indicate how and what is passing, or where it came from and where it is headed. I've learned that shape and direction of the sound shadows are less important, however, than *how* the shadows in interfering. For example, quickly, with hesitation, shaking, swooping and approaching and departing (perceived as growing and shrinking) -The most effective Sound Shadows require consistent, higher frequency sounds which create the contrast between blocked and unimpeded sound reception. I have found white noise and blue noise to be the most useful for the purpose of depicting the moving body through sound shadows.
Can the movement of sound	-Thin plywood surface	-Using a multichannel panner plug-in in Ableton	-I am tracking the sound I hear moving with my eyes, but not directly, It is	The movement of sound, changes its quality according to the doppler

illustrate action on a 2-dimensional surface?	-Audio transducers adhered to the back of the surface in play	live I designated which transducers would play sound, using the sequencing of sound to create the illusion of sound moving across a 2-dimensional surface	like a peripheral sensing of where sound is on the surface. It's referencing where the sound was and where it is now that allows me to deduce that a line or a curved pathway has been made by the sound.	affect and therefore is technically a different sound. By choreographing the movement of sound, I am creating compositions based on the suggestions of movement through sequencing and micro-tonal variations which related to the quality and speed of movement.

Appendix II

Project *Motion-Motion:* reuniting sound and visual

https://youtu.be/ddw5sAugPTM

Fig. 19: Gemma Crowe, *Motion-Motion*, 2021. Multimedia. Installation Documentation: Entrance

The audience enters a dark room with a sliver of light which splits the darkness at the centre of the room. Standing at the edge of the room you can see the light gently drift up and down the wall and back and forth across the floor. There is just enough light to beckon, and as the audience enters, they are met with a consistent and distinct, but indistinguishable sound. A cord is illuminated, skimming the floor, crossing the beam of light where a pair of headphones lie casting a long shadow. Blinking into the darkness the audience might be straining to feel into the senses to try to map the new environment. The sound, now recognized as intentional, also comes from the floor. With this understanding comes a keen awareness of the body in this space, and a sense of vulnerability to obstructions at ground level necessitates a careful maneuvering through the room. The soundtrack, which at this point resembles static, is subtle and familiar as it comes and goes.

By moving further into the space and putting on the headphones, the listener is positioned within the beam of light, which now draws up the body and back down to retreat across the room. With the headphones on, it's as if the sound seeps into the ears of the listener for a brief moment and then draws back again as it fades out of the headphone track and grows louder in the speakers. The timing of these two separate tracks creates the illusion that the sound is travelling back and fourth. The headphones act as a barrier which the sound passes through to create an intimate, internalized performance. At this point the audience might be tracking the light while trying to confirm the location of the sound. They might be sensing the immaterial motion in the space. As they attune to the environment, the audience may begin to feel involved, implicated. They might even recognize the triangulation that their body completes in space between the light and the floor, the speakers and headphones.

This project was inspired by Tim Ingold's lecture *Noise Sound Silence,* in which he brings attention to the senses and stimulus, positing their independent generation. Proposing that the receipt of light and sound might actually be generated in our heads, Ingold grounds his theory in the case of individuals experiencing sound and light in the absence of such stimulus.

The static sound is a type of white noise which I use as material, tempering the space. Created from an equal measure of all perceptible frequencies, white noise pads the environment of the listener from veritable sonic events and punctuating sounds. I use volume as a marker for distance. Unlike the ability to shut our eyes, we cannot control the intake of sound, so we use proximity, making sound a determiner of space. By this very method, I am offering layers to the auditory space in hopes that the audience may start to make a distinction between their own body (internal state) and their surroundings. It is my intention that, enveloped in a solitary experience of sound while wearing the headphones, sharing the experience of sound in close proximity with others helps to define, with sound, the degrees of separation between the mind, as an internal thought process, and the shared environment.

https://youtu.be/tOJOSKh5RvY

Fig. 20: Gemma Crowe, *Motion-Motion*, 2021. Multimedia. Installation Documentation: Listener Perspective

In the development of the sound track for *Motion-Motion* I recorded my own extended exhale with a contact mic, then looped it in its most steady moment, for seven minutes of sustained sound. This mediation of my breath resembles waves crashing, and I am emulating the recycling of this consistent sound. Along with white noise, there is also "pink noise", "brown noise" and "blue noise"–mimicking, with frequency, the levels of the color spectrum[1]. The slightly higher frequency of my exhale to nestled-in nicely with the other sounds present in the installation–the whirring of the projector, the rumble of trucks passing on Great Northern Way, and the buzz of a campus full of fluorescent lights. This audibly *blue*-noise soundscape serves to gently lift the focus from the incidental noise floor to an intentional composition.

Ingold notes of the experience of light and sound, that

[1] Each sonic hue had a slightly different distribution of volume and intensity. Blue-noise has more pronounced higher frequencies and pink noise has louder bass tones.

> an impervious boundary separates mind and world and mediates our exchanges between them and that boundary is the body, including its sensory organs, and the touch sensitive envelope of the skin. [...] Light and sound are neither in here or out there... the very experience of light or of sound is one in which the boundary is dissolved.

In considering this boundary, I intend the light and sound in *Motion-Motion* to permeate the borders of the body in a way that the audience might take note of.

The blue-noise soundtrack in *Motion-Motion* was animated by an embodied technique that I have developed, that spatializes sound using the movement of my body. The looped blue-noise was played back through a speaker acting as a single source of sound. I then recorded this single point of sound in space using in-ear binaural microphones. While wearing the microphones I moved my body in space, actively recording the blue-noise track in different positions around my moving body. I moved towards and away from the speakers paying attention to how my weight swayed. I moved through circles, spirals and figure-eights created by my body. The result is a binaural audio track which features the blue-noise moving autonomously in space, reanimating the sound around the body of the listener.

The development of the moving, projected light echoes the embodied process which spatialized the sound in *Motion-Motion.* I recorded this same movement standing between a source of light and the camera, inverting the colors and increasing the contrast. The result is a shadow made of light swaying and swooping across the screen. When the video is projected, it creates light which also moves throughout the room as if it had a physical form.

The sense of boundaries permeated is produced through the use of two separate tracks playing the same binaural blue-noise. One plays through the headphones and one plays through the speakers. The headphones and speakers take turns transmitting the blue-noise fading in and out at a rate similar to a cycle of breath or waves breaking and

withdrawing. The effect is an auditory illusion of the blue-noise track moving back and forth between the speakers and the headphones. Entering the room, the listener might hear the sound coming through the speakers, or they may encounter the effect of the light first and find the headphones placed at the intersection of the action. Putting on the headphones and finding the sound here, just as it disappears, results in much of the volume from the speakers being blocked by the headphones. The headphones create the final level of impasse.

The entire installation is a culmination of several layers of development, actions that may not be recognized but contribute to a more specific uptake of the work**.** *Motion-Motion,* and everything it encompasses, runs on a synchronized loop. The effect is the opposite of a performance, where the events transpiring in the space are independent of any audience. This places the choice to enter, to stay and to exit on the audience. A natural hesitancy in darkness and an unwillingness to spend time are inherent conditions of the installation. This room, sequestered from the rest of the activity in the building, is also a bid for an intimate and grounding moment. The speakers and the projector placed on the floor means that, relative to the high ceilings, the work is happening low to the ground. As the light from the projector grazes the slickness of the floor it reflects and disperses some of the light upward, creating a more three-dimensional sense of the moving form of light. I have a particular affection for the floor and find that when called to acknowledge the foundation beneath my feet I become more aware of my body and of the conditions around my being here and something settles a little. The experience is relatively ambiguous and the invitation isn't entirely prescriptive. With this I hope to create a space where the audience engages with the work through self-reflection and sensation and takes the chance to be with themselves and embody the perceptible motion.

Proprioception negotiates the boundary of the body as it encounters the surrounding space. By bringing attention to the bodily boundary, what is ours and what is other is temporarily bridged and, perhaps for a moment, we can leave our immediate bodily circumstance. *Motion-Motion* works with the immaterial, activated by darkness. The provisional nature of the setup–speakers, headphones, and a projector on the floor, laid

bare–can overlooked in the dark as attention is directed inwards, rather than to deceive the audience. While the light is an invitation to participate and situate within the installation, it also gently illuminates the equipment. Revealing the source of light and sound allows their effect to take precedence, so that the audience might be curious about how they are experiencing the work rather than how it is being produced.

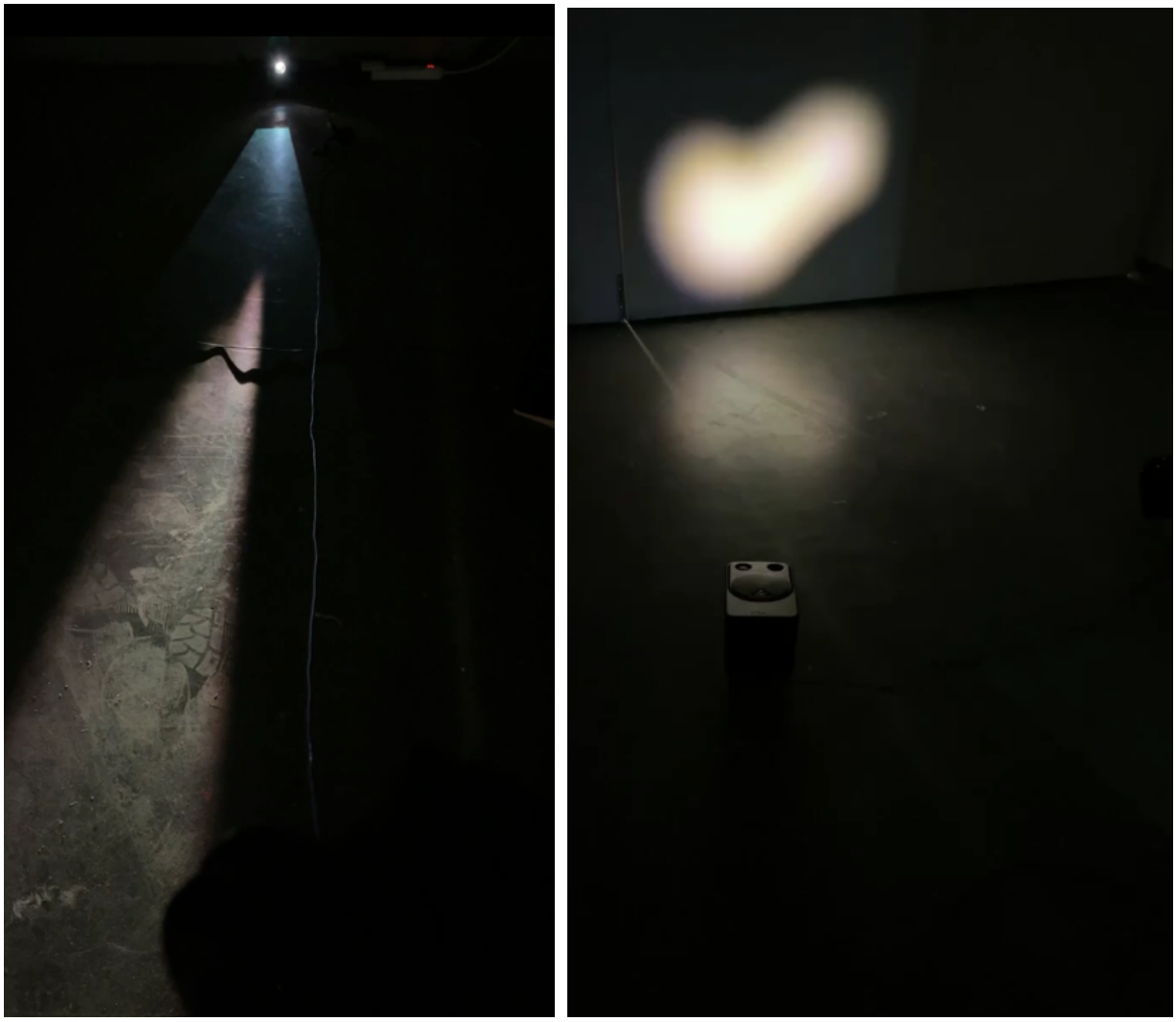

Fig. 21 + 22: Gemma Crowe, *Motion-Motion*, 2021. Multimedia. Installation Documentation.