

Attuning to what's in/out of tune: from listening-as-usual to opening up more parts of the world to love in music education research and practice

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Abstract

What does human exceptionalism and a human-centred analysis have to do with what counts as music, education and education research? This article troubles that question by 'sticking' to a video clip of two boys performing a song on a beach in rural Norway. Through a diffractive method of 'Listening without Organs', it traces the agencies of sound waves and explores music education's entanglement with everyday life. Through an agential realist analysis of the video clip as a phenomenon, we show the porosity of taken-for-granted research concepts such as 'data', research 'site', research 'participants', theories and methods. Knowledge-making as a worlding practice troubles human exceptionalism and opens up more parts of the world to love in music education research and practice. By extending the theory and practice of listening to include more-than-human and 'lesser'-human sounds, concepts such as music, education and children are also stretched and opened up for us.

Keywords: childmusicking; pupilmusical intra-actions; music education; children; sound; posthumanism; agential realism; agency; Listening without Organs; postdevelopmentalism

Sticky data gets/keeps us going

This article unfolds through sticking to a video clip made during the fieldwork in Kvile's PhD research. Throughout the article, we explore how research methods, theories and apparatuses

produce and perform selected data that 'sticks'¹, making some realities possible to the exclusion of others. This exploration focuses on child-music relations but resists the developmental perspectives which are often found in music education research involving children (Ilari & Young, 2016). Through storytelling, letting questions cascade and tracing entanglements, this article shows how child and music can be researched as phenomena through agential realism (Barad, 2007) and offers a postdevelopmental and posthumanist alternative to human-centred music education research practices.

When we meet on Zoom to discuss the example for this co-authored article, Synnøve is remembering and re-turning² to data from her PhD research and shows Karin a video clip that got *stuck* to her. We watch and listen to it together (meet³ Figure 1).



Figure 1: QR-code to [Mini-troll video](#) and diffracted screenshot

¹ See below.

² Re-turning is a posthumanist methodology. When re-turning to the 'same' data, readers, as well as us authors, make different connections. With each reading, the con/text is different. The reason is that the world that includes humans like us will have moved on. Relevant for our analysis is that 'even' mountain ranges move on (see Barad, 2014, p. 168).

³ 'Meeting' is an important concept in Karen Barad's agential realism. They write: "...we participate in bringing forth the world in its specificity, including ourselves. We have to meet the universe halfway, to move toward what may come to be in ways that are accountable for our part in the world's differential becoming. All real living is meeting. And each meeting matters" (Barad, 2007, p. 353).

This⁴ digital data fragment sticks. MacRae et al. (2018, p. 503) argue that “‘sticky data’ sticks out, sticks to and often gets stuck in our thoughts, feelings, in our throat, on the page, in fieldnotes, camera lens or memory”. We return later to the stickiness of this data fragment, but first describe how this video materialised. Synnøve’s PhD research focuses on child-music relations in everyday life. One of the motivations for her PhD project was the invisibility of the perspectives of children aged 6-13⁵ in research. The little music education research there is about children of this age tends to be through the lens of developmental psychology (Ilari & Young, 2016). This echoes the field of childhood research more generally (Murriss, 2016; Osgood, 2023; Tingstad, 2019). Some research studies engage with children’s everyday musical activities in specific contexts (Andang’o & Pacheco, 2016; Campbell, 2010; Gluschkof, 2016; Ilari & Young, 2016; Koops, 2018), but they draw on humanist and representational logics that centre the child’s subjectivity. In contrast, our research enacts posthumanist theories and practices, especially agential realism (Barad, 2007; Juelskjær, 2019, 2024), where child is researched as a ‘phenomenon’ (Murriss, 2016).

Synnøve’s primary research focus is on agency and the entanglement of music and children in everyday life, which has generated the concept of ‘pupilmusical intra-actions’ (Kvile & Christophersen, 2023) and ‘childmusicking’ (Kvile, 2024). The fieldwork⁶ we draw on comprises Synnøve’s observations of ordinary school days in a 4th-grade class for one day a week during one semester and intra-views (see Kvile, 2024) with three of the observed children in their homes. Part of the fieldwork included following the children on a half-day school outing to a beach. They walked to a nearby fjord familiar to the children. Acquainted with her research focus, one of the teachers calls to Synnøve. Synnøve’s field notes start the storying:

“Synnøve, have you noticed that two boys have made a song? You should ask them to sing it for you”, the teacher says while pointing in the direction of the boys’ position at the beach. I quickly get to my feet and walk over to a group of boys who are next to a boathouse at the end of the beach. I ask them if they’ve made a song and if they want to sing it for me, which two of them do. The lyrics are | |: Mini-Troll - Oi!, Mini-Troll - Oi!, Nana, nana, nana, nana, nana, nana, nana, nana :| |.

Magnus⁷, one of the boys, explains how the song was made. He had found some small stones for the miniature trolls he had planned to create in arts and crafts. When he shows them to Odin, with each stone Odin exclaims “Oi!”. Magnus then tells me: “So, then we just made this song and sang it as a duet”. I ask, “Will you make a dance to go with it as well?”. “No!” Magnus immediately replies, while Odin simultaneously makes some dance moves with his

⁴ Throughout this article, we trouble space as a fixed location ‘in’ space and time. This includes the use of ‘this’ (as opposed to ‘that’) and ‘now’ (as opposed to ‘then’) (Barad, 2007, p. 182), as well as ‘data’. Data is not inert and static but also agentic as part of a distributed and intra-active agency (Barad, 2007; Koro-Ljungberg et al., 2018).

⁵ This is the primary school age in Norway.

⁶ The data handling in this study has been reported to the Norwegian Centre for Shared Services in Education and Research and is in accordance with both national data protection regulation and institutional routines for research ethics. All (human) research participants in this study have provided appropriate informed consent.

⁷ The boys have been given fictitious names due to General Data Protection Regulation (GDPR).

arms. I then decide to make a video recording, but realise I need to make sure I am allowed to do this. Erling, a third boy who has been there all along, is also making a version of the Mini-Troll tune. His version is not as clearly structured, nor as adhering to twelve-tone equal temperament tuning as the original Mini-Troll melody. He asks if he could join in on the Mini-Troll tune, and Odin passes on this question to Magnus while saying "It's OK if he joins in, isn't it?". Magnus replies, "No, this is our song, he cannot join in". Luckily, I have brought with me all the written consent papers in my backpack, and I find the two boys' names and see that their parents have ticked off the boxes for both audio and video recordings. Thus, I ask if they would allow me to film them. Magnus says 'yes' at once, while Odin doesn't want to show his face. I say I won't do anything they don't want me to, but before I'm done reassuring them about my immense respect for their consent, they have solved the problem by turning their hoodies around – making the hoods cover their faces. So, ready to be filmed, I position them against the door of the boathouse, since facing the sea would have meant facing the sun, which would have made the image dark, and I start recording with my iPhone.

Afterwards, they ask if I am going to post it on Social Media like YouTube or something, and if it will become a hit. I assure them that I am not posting it on any public digital platform. "But surely our classmates can watch it?" Magnus says. They seem disappointed and start talking about how big they could've become. Mitigating the impact, I suggest that they could ask their parents to record them singing later on, and then they could publish it – if they wanted to.

The aim of this particular way of writing up the event is not to 'capture' what *really* happened in the past descriptively. Instead, the care-full selection of words makes it possible to trouble past-present-future(s) as a linear temporal continuum. Already knowing that our aim of this article is to attune to what normally escapes our attention in music education research when we focus on human subjects only (and often in relation to developmental notions of 'progress' or 'maturing'), this particular way of storying the event troubles 'listening-as-usual' (Murriss, 2013, 2016). The vignette is neither a purely factual, nor a neutral capturing of the play event. The 'vignette' is not empirical data in the sense of a representation of what happened independently from the researcher's gaze. Analysing data diffractively involves installing oneself in an event of 'becoming-with' the data (Haraway, 2008, p. 16). So, we ask, how do we install ourselves as posthumanists in this event that is not in the past as a closed-off event 'behind us', but 'in front of us' and open for a dis/continuous⁸ analysis (Barad, 2014) – a becoming-with? It involves not uncovering the (symbolic) meaning *behind* the vignette in a representational way but as *a newly unfolding 'making-with' event* that entangles the field trip 'then', with the writing 'now' and way(s) of reading it in the future(s) to (be)come. Synnøve's iPhone is not a tool to enable her to go back in

⁸ The forward slash in dis/continuity invites us to think of underneath and before, prior to the binaries, and to ask: What cuts are being made here that we have such a distinction between continuity and discontinuity? What work does it do and what kind of violences does it produce? For example, the binary enables material-discursive practices of progress and development in music education. The fundamental dis/continuity of Quantum Field Theory (QFT) troubles the nature of difference: "'Otherness' is an entangled relation of difference" (Barad, 2007, p. 236).

(uni)linear⁹ time and analyse what was 'really going on' during the field trip, in or with Magnus and Odin, but each re-turning is a 'new' material-discursive event, emerging as 'new' only with reading the data (Dixon et al., 2024; Murris & Menning, 2019).

Storying events in a posthumanist way resists a representational analysis that already assumes binaries such as inside/outside, interiority/exteriority (Murris & Zhao, 2022, pp. 92–93).

Researchers are also entangled with the phenomenon, activated by the vignette in its becoming data. This not only involves cognition, but also a be(com)ing affected by the experiences of bodies in relation. Posthuman vignettes "expand the ontologies of knowing/becoming/doing by decentring humans and taking the pulse of the flows between humans, nonhumans, and more-than-humans" (Lemieux, 2021, p. 494). For example, Synnøve could have written that she was sensing that something worthwhile was about to happen and that *therefore* she reached out for her video camera. After all, the teacher had drawn her attention to what was happening. The boys were singing, and she was researching music as part of children's everyday lives, so, the teacher probably assumed that Synnøve would be excited about listening to and watching them. Moreover, Synnøve could have written that, like the teacher, she identified that the boys' were singing a song in tune (= music), and although she did not think it was *that* special, by filming it, she would, in an affirmative way, show the boys that she was interested in them and their everyday music practices (as a good music teacher would do). However, the way she remembers it, she did not really see it as very interesting or 'new', but rather as something quite ordinary. At the same time, drawing on her experiences as a researcher, she also knew that something 'ordinary' could easily and unexpectedly turn into something very exciting later. This is indeed what happened when we started to discuss together which data fragments were of interest to analyse. The video clip became 'extra-ordinary' when Karin got excited about how the materiality of the hoodies worked for the boys to become YouTubers. Responding to the video clip – allowing the video to make itself intelligible to us (Barad, 2007) – is part of our response-able practices as posthumanist researchers (see below). Following the hoodies made us attune to what at first sight might have seemed 'nothing special' and invited us to 'stay with the trouble' (Haraway, 2016). Noticing the difference between Synnøve's first response and what a re-turning to the video clip produced, creates an interference pattern that matters ontologically, epistemologically and ethically for doing our research with children and the more-than-human differently. The diffractive reading got stuck in our thoughts, feelings and throat (MacRae et al., 2018, p. 503) and is now stuck to the pages you are reading-with.

With a posthumanist analysis the very constitution of matter – Magnus, Odin, Erling, the video, the hoodies, the sea, the sounds, the researchers' writing – are not objects or things, but *phenomena*, so always already entangled in less-than, more-than and other-than-human relations. Later, we explore how an agential realist analysis of the video clip makes us think differently about Odin and Magnus and therefore about 'child', but also music and sound, which helps us move to new understandings of music education and 'childmusicking' (Kvile, 2024). Moreover, the

⁹ Karen Barad does not reject linear time as such but works with the notion of entangled multiplicities: the 'lines' between past-present-future are entangled in any given moment (Barad, 2007, p. 71). They argue for time and space as a 'strange topology', where past, present and future are inside one another.

ontological shift matters for how we do any kind of education research because it changes key concepts enacted in qualitative research, such as space and time and the core dichotomy of nature-culture. This matters not only for how the analysis is done, or what knowledge is produced, but also for which realities the research enables (Rosiek, 2018).

Child and music as phenomena – a matter of objectivity and response-ability

There is no unmediated photograph or passive camera obscura in scientific accounts of bodies and machines; there are only highly specific visual possibilities, each with a wonderfully detailed, active, partial way of organizing worlds ... Understanding how these visual systems work, technically, socially, and psychically, ought to be a way of embodying feminist objectivity (Haraway, 1988, p. 583).

Especially when technology such as a video is involved, the assumption is that the video clip is evidence of what happened in the past (Menning & Murris, 2023; Murris & Menning, 2019) and can be accessed by any researcher, objectively (in a scientific realist paradigm), or intersubjectively (in a socio-constructivist paradigm) (Murris, 2022a). But this quote from Donna Haraway reminds us that we need to pay attention to how visual systems work to create certain ontoepistemologies. It is not only that, “not everything is possible at every moment” (Barad, 2007, p. 182) when doing posthumanist research, but Karen Barad warns that “[t]he “world kicks back”, not in the sense of individualised agency, but agency as “distributed over nonhuman as well as human forms” (Barad, 2007, pp. 214-5). It is not individual bodies but *intra-actions* that are agentic (Barad, 2007, p. 184). Juelskjær et al. (2021, p. 144) point out that what is ‘real’ in agential ‘realism’ doesn’t exist independently but is *iteratively enacted through intra-action*. Intra-actions “reconfigure what is possible” (Barad, 2007, p. 182). Intra-action is about connectedness with the world. It assumes that, as individual humans, we have no control over the network of relations we always already find ourselves in and how they affect us. Phenomena, not “independent objects with inherent boundaries and properties”, are *the primary units of existence* – the basis of a new ontology (Barad, 2007, p. 333).

In sum, agential realism (a particular form of posthumanism; see Juelskjær, 2019; Juelskjær et al., 2021) gives us a technology of embodiment (Barad, 1996), a ‘feminist objectivity’, thereby reconfiguring the concept of *objectivity* itself. Feminist scholars, such as Haraway (1988) and Barad (1996, 2003, 2007), have profoundly challenged the idea of objectivity as research neutrality, because such a notion of objectivity is made ontologically possible by the nature-culture dichotomy (Juelskjær et al., 2021, p. 143). The separation of nature and culture is a core binary (Kvile et al., 2025) which produces more binaries – e.g., adult and child, object and subject, researcher and researched – and thereby continues the sedimentation of a world consisting of pre-existing ‘objects’ and ‘subjects’, which are believed to be stable, independent entities. Instead, agential realism draws on an intra-active relational ontology, meaning that relations are ontological prior, and the world materialises through them. Objectivity attends to these materialisation processes and “is about being accountable and responsible to what is real” (Barad, 2007, p. 340). A Baradian notion of objectivity does not nihilate subjectivity (e.g., Synnøve who made the film) or erase the subject (e.g.,

Odin, Magnus or the other children). Nor does it regard objectivity as achieved by disentangling and disengaging the subject from the object (as in much research). It achieves objectivity by taking responsibility for how the knowing subject (us, the authors, and you, the reader) and the apparatuses (e.g., the iPhone, YouTube, curriculum documents) are always already ontologically entangled in what is produced (Barad, 2007). This position is intriguingly phrased as: "Subjectivity and objectivity are not opposed to one another; objectivity is not not-subjectivity" (Barad, 2014, p. 175). Agential realism resists pulling subjects and objects into categorisations (including the subject/object and subjectivity/objectivity distinction) and reworks these concepts as quantum entanglements. The kind of objectivity Barad is interested in avoids binary logic and therefore does not assume the objective/subjective binary (with intersubjectivity as an intermediate position) (Barad, 2017, p. 37). How objectivity (and subjectivity) is operationalised in research depends on the *specific connectivity* (Barad, 2007, pp. 470-1, fn 45), the research question, and also varies from discipline to discipline. Crucially, objectivity cannot be settled once and for all (Juelskjær et al., 2021). Taking into account the specificity of connections – that is, quantum entanglements – is a matter of responsibility or, to be more precise, *response-ability*. Mari Ystanes Fjeldstad (2024) summarises that:

the value of posthumanist research lies not in its accuracy of representations but in the futures that are enabled or disabled by the research (Pratt & Rosiek, 2023). Being response-able and accountable for these potential futures extends beyond mere prediction of outcomes. It involves responding to the parts of the world that the research brings into being (p. 9).

In an interview, Donna Haraway (Davis & Turpin, 2015) explains that response-ability is the cultivation through which we render each other capable, making it possible for the 'other' to respond. At the same time, she points out that there are no fixed methods in response-able science. So, what is at our disposal as response-able researchers? Juelskjær et al. (2021) suggest that:

the responsibility lies in researchers both making themselves susceptible and sensitive to different forms of response and in enabling a response, providing the phenomenon under study (of which the researcher is an enacted part) with the opportunity to respond. A central question then becomes: how does the researcher tune their sensory apparatus into feeling or sensing this response? (p. 144, our emphasis).

We respond to this poignant question posed by Malou Juelskjær and colleagues: How does the researcher tune their sensory apparatus into feeling or sensing this response? It guides us in our agential realist analysis. By sensing and tuning into the 'less human' (child) and more-than-human (beach, sounds), we diffract through the encounter and stretch 'our' story and what is meant by voice. We do this by not only including the more-than-human (Fjeldstad et al., 2024), but also by stretching the concept of hospitality to include multiple entangled times and spaces (Murriss & Bozalek, 2019, 2023). As Juelskjær (2024) puts it:

As a researcher, it is necessary to attune one's sensorium to matter in the dual sense of meaning and mattering - a materialization of particular practices of delineation, boundary

setting, and articulation. Furthermore, this sort of research process involves sensitivity toward how and what different spaces and times matter as part of the research phenomenon: As specific ongoing reconfigurings of space and time, phenomena are diffracted and temporally and spatially distributed across multiple times and spaces simultaneously (Juelskjær, 2024, p. 150).

Such a transdisciplinary approach to data analysis reconfigures the boundaries between the humanities, natural sciences, and the social sciences, thereby not only 'undisciplining' the disciplines, but also doing justice to Indigenous knowledges and ontologies (Higgins, 2021). In our agential realist account of the event (read as phenomenon) we experiment with letting the questions cascade (Juelskjær, 2024). Importantly, these questions stay with the complexity of the phenomenon *in its specificity*.

What questions cascade when responding to the video clip in its specificity?

The Baradian notions of quantum entanglement and phenomena trouble binaries at their core – even popular posthumanist distinctions between 'human' and 'nonhuman', 'more-than-human' or 'other-than-human'. These highly differentiating boundary-making practices "produce crucial materializing effects that are unaccounted for by starting an analysis after these boundaries are in place" (Barad, 2012, p. 32). What agential realism asks us to imagine are other ways of doing education (research), without the dichotomies always already in place. What are the crutches for education when un/doing the power-producing binaries that have crippled how humans relate to each other in education and to the more-than-human?

By caring for differences that matter in their specificity, Barad's passionate yearning for complexity re-works concepts such as space, time, memory, identity and difference. Barad invites their reader to meet the question *How can I be responsible for that which I love?* (Murriss, 2022a). The 'that' in the question does not signify objects and subjects in space and time as containers, but as intra-active *phenomena* that include humans, but also the more-than-human, through the transdisciplinary reading of texts through one another, including physics and queer theory. Agential realism demands attention to the ethical fibre that runs through the fabric of the world (Juelskjær & Schwennesen, 2012). The notion of response-ability *opens up more parts of the world to love*. Agency, Barad points out, "is a much larger space of possibilities than that generally considered" (Barad, 2007, p. 182). In agential realism, the world's worlding processes are ontologically in/determinate, only becoming determinate through and from within intra-actions (Barad, 2007). One of the ways to stay with in/determinacy, is to stay with the complexity and specificity of a phenomenon. Inspired by Malou Juelskjær's (2019, 2024) methodology of letting questions cascade, we start to ask: How does tuning into the song Mini-Troll *as a song* make it become a specific material, such as a video-clip of two boys singing? How is Western music education and Western music theory, reverberating through the tones of Mini-Troll? How did it end up as a video clip, and what is cut out from the iPhone's frame ('agential cut')? What were the apparatuses and boundary-making practices at work that made the school take the pupils to a beach in the first place? What else can we hear that might be inaudible to the *human ear*?

Inspired by Sundberg (2014, p. 39), Juelskjær (2024) suggests that as researchers we need to do our 'homework', that is, we need to examine our epistemological and ontological assumptions and the privileges within these assumptions and unlearn them, especially those privileges that allow "the perpetuation of silence about ongoing colonial violence" (Juelskjær, 2024, p. 150). We ask ourselves, what "ongoing colonial violence" is happening through the video clip? Which lessons should be un/learned? Where does this homework start? Will it ever finish?

Since the Mini-Troll tune was gathered as a video clip, it allows us to re-visit the tune as often as we like, and although we have watched and listened to it many times, this time we decide to respond to it again, but with a focus on attuning to the sounds: what can be heard (and not)? As articulated in the storying of the video-clip's materialising as 'data', one of the reasons it became 'data' was that the teacher told Synnøve that two boys had made a song. This time, we centre the song and the sounds, not the child humans. What we seek, is the form for attuning that Brigstocke & Noorani (2016, p. 5) writes about: "Attuning to more-than-human worlds requires a radical decentring of authority, acknowledging the ways in which nonhuman forms of agency coauthor heterogeneous worlds". What happens when we listen diffractively (Barad, 2007) and trouble human exceptionalism?

Tuning into Mini-Troll through diffractive listening: Listening without Organs

Let's watch and listen to the video again and explore what this meeting produces (differently):

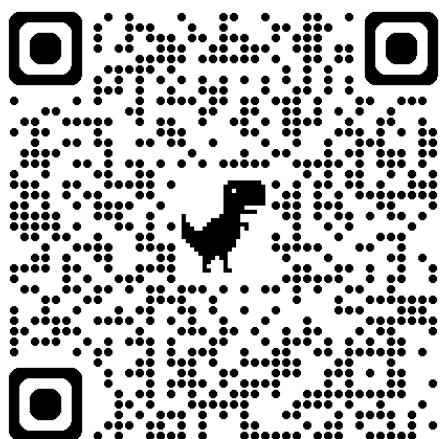


Figure 2: QR-code to [Mini-troll video](#) and diffracted screenshot

Digital sound waves flow through our speakers; as a music educator, Synnøve quickly identifies the tones and rhythm of the song through Western musical notation, which implies the tuning system called 'twelve-tone equal temperament' (12-TET)¹⁰. The piano is an example of a musical instrument tuned in that way, where the difference in pitch between each piano key is (almost) the same. Interpreting sonic information is never a neutral act, but "always a combination of personal experiences and sociocultural norms and values" (Gershon & Wozolek, 2023, p. 1) which "involves actively attending to some sounds at the expense of others" (Gershon, 2020, p. 1168). If we listen to the video clip without testing the sound against Western musical notation, we can hear a lot of other sounds. These sounds are not as easy to transcribe or identify, rather, they seem to be ontologically in/determinate. In/determinacy points to the 'nature' of intra-actions (Barad, 2007) that makes sound/listening become: the listener, the digital speakers, the video clip, the voices in the video, the beach, the surroundings (with, with, with) are not stable or 'the same' every time we re-visit the video clip, but always in the making, becoming-with (Haraway, 2016) and diffracting through when the play-button is pressed. The "colonial violence" (Juelskjær, 2024, p. 150) Synnøve does to the Mini-Troll tune when she applies Western musical notation to transcribe it, is to attune to certain sounds to the exclusion of others, because she listens through measuring apparatuses (Barad, 2007) such as 12-TET and Western music theory¹¹. In Western music education, 12-TET is a dominant measuring apparatus and a tone not adhering to it would often be considered 'out of tune'. For instance, an ordinary music educational practice would be to evaluate the musical performance of the boys as 'good' or 'bad' through the criteria of singing in tune or not. Generations of Western music educator ears have been trained to listen through such measuring apparatuses, showing how listening is a relational, polyphonic act always entangled with notions of power and privilege (Gershon & Wozolek, 2023). Through such measuring apparatuses, music education can do a lot of ontoepistemic injustice (Murriss, 2016), or colonial violence (Juelskjær, 2024), to (in this case human) voices. When voice is regarded as belonging to a singular (human) body, such as a boy's body, it also becomes the boy's being (onto) and his knowing (episteme) that is scrutinised when evaluating the singing.

Agential realism with its in/determinate subjectivity troubles the notion of a voice 'attached' to a singular individual (Murriss, 2016). Dis-organ-ising the body involves opening up possibilities to attune to what the body can do beyond the restricted set of habitual actions. Inspired by Deleuze and Guattari's (1987) 'Body without Organs', Lisa Mazzei (2013, p. 733) has developed the notion of 'Voice without Organs' "to describe a different kind of human being that enables one to think voice differently" – and by the same stroke – think about 'listening' differently: Listening without Organs (Murriss, 2016). For Deleuze and Guattari (1987), a human being is not a singular subject (or product), but multiple. Mazzei (2013, p. 733) explains this multiplicity as an "assemblage, an entanglement, a knot of forces and intensities ...that produce a voice that does not emanate from a singular subject". This implies that agency and intentionality are not located 'in' a person, but is distributed. Voice is produced in relation with material-discursive human and more-than-human others. Listening

¹⁰ For more information, see here: <https://www.classicfm.com/discover-music/music-theory/why-are-there-only-12-notes-in-western-music/>

¹¹ For more on Western music theory's connection to colonialism and racism, see Ewell, 2021.

without Organs (LwO) disrupts the common practice in education of 'listening-as-usual' (Davies, 2014), that is, listening as evaluating, interpreting – listening out for the same, thereby confirming what we already know. Instead, diffractive listening also includes the more-than-human and a listening-as-experimentation.

Continuing our diffractive listening, we wonder what other sounds we can hear if we listen beyond the Mini-Troll tune in the video clip. We hear a female adult speaking, saying words like 'men du' (meaning 'but you') and then later on 'eg kan hjelpe deg over viss du treng det' ('I can help you over if you need it'). These sounds are audibly present in the video, but visually absent. Why can we hear the adult voice and not the child she is talking with? We are wondering about the more-than-human voices – of the breeze, the fjord or the birds chirping. Who or what are the birds responding to? Birds chirp to each other for many reasons, including when they are in danger or looking for a mate. They also sing when they are happy because like humans, their brains have dopamine and opioid receptors, which regulate how they feel. Lloro-Bidart (2017) refers to birds as persons. To *hear* the birds *as* research participants we need to assume equality and symmetry in our knowledge practices – including being modest and humble as a human – being less human-centred, and to acknowledge how sound as vibrations can move "all kinds of bodies in all kinds of ways" (Gallagher et al., 2017, p. 1250). We need to pause and ask: what is the colonial violence we do to the more-than-human? For example, the 'absentpresent' of the voice or sound of the fjord, the stones, the water, the glaciers, the ice, the seabed – all moving in different speeds as part of the world. We are interested in listening out for the new and unfamiliar – a distributive thinking without centred (human) voice(s). Carolyn Cooke (2024) talks about a polyphony:

... that has the resultant effect of empowering the momentum of humans and non-humans to continue to create something new or different, rather than relying on 'stuck' habits of what is heard, valuing certain sounds over others or replicating what already exists (Cooke, 2024, pp. 5-6).

Through the iPhone, some entangled relations are filtered out, just as music education accentuated the Mini-Troll tune while other sounds went unheard. Thinking about what is entangled in the making of Mini-Troll, we re-turn to the story about how the tune was composed. Magnus told Synnøve how he had gathered stones that would be used in Arts & Crafts to make Troll-figures. The stones are not visibly present in the video clip, but on a rocky beach they are everywhere. Synnøve, who is filming, is standing on stones. There might be stones in their pockets. And although the ground near the boat house is made of cement, that too is a stony material – only reconfigured. The reconfiguring of stones into trolls is also very much present in the song, although visually absent in the video. Trolls are central figures in Norwegian folk tradition and mythology and play a major role in Norway's tourism industry¹², just like fjords and mountains do. Chakraborty (forthcoming) argues

¹² This is how Visit Norway present trolls: <https://www.visitnorway.com/things-to-do/art-culture/the-mythical-norwegian-trolls/>. Trolls are most commonly known as giants, but can also be small. They are seldom friendly, but rather scary and dangerous monsters. As narrative characters, they are not very smart, which makes it easier for humans to avoid them. Interestingly, they turn into stone if they are struck by sunshine, which makes walking outside in broad daylight quite safe for humans. When listening to the boys singing about miniature trolls, we assume they have the large trolls in mind.

that the voice of mountains interacts with humans and at the same time transcends our interpretive capacities. Troubling the animate/inanimate binary, he argues that plants, insects and birds probably know more about the rhythms of mountain life and the dance of geological time than we humans do. Mountains' agency emanates from the performative agency of the earth itself (Chakraborty, forthcoming).

Through the polyphony of mountains, stones, trolls, a rocky beach, schooling-being-done-outside 'in' nature, by a fjord on the west coast of Norway, we un/learn and attune to how highly specific natureculture agencies are part of the Mini-Troll tune. Be(com)ing recorded as a video clip as well, involves even more intra-acting agencies (Barad, 2007). As mentioned earlier, the Western music education colonisation of how to listen to music 'correctly' made both the teacher and Synnøve aware of (the object) 'music' being made by (the subjects) 'two boys'. Having a predefined conception of what music is and how it can be performed (by humans), we could not only hear it, but also see it. Human vision and the representational logic of separating the world into predefined objects and subjects, were important agencies that made this video come into existence. It also affected how the video was made. Positioning the boys against the boathouse to get 'good' footage tells us that not everything is worth filming; not everything included in making the tune Mini-troll is included in the video.

Carolyn Cooke (2024) writes that "[t]o (re)hear the sound as relational, as a connective force between us and what we are entangled with, is to think about the role of this 'sonic knowing' in music education spaces" (p. 8). This resonates with Walter Gershon's (2011) writings of how "sounds form educational systems of embodied meanings" (p. 68), through norms, values and sociocultural constructions. By practicing LwO, we have shown how (some) measuring apparatuses affect how sounds are heard and how such a diffractive listening can challenge the practice of 'listening-as-usual' when working towards ontoepistemic justice. Through sticking to the sound of a video clip and analysing it as a phenomenon, we have articulated how it is entangled with music education, research, Norwegian folklore, trolls, stones, Arts & Crafts, beach, iPhone, children, adults, singing in tune (or not), twelve-tone equal temperament and ontoepistemic violence (Murris, 2016, 2017). Temporal diffraction as a methodology breaks up the continuum of time; it de(con)structs. In this way, diffraction disrupts unilinearity in knowledge production, producing "new conditions of possibility" (Barad, 2017, p. 50) and, with/in that process, articulates relational be(com)ings otherwise ignored. The methodology makes us stop and think and re-turn. Working slowly through con/texts, we pay (more) attention to the specificity of what matters (differently) and for whom. In the remainder of this article, we explore the implications of this shift in ontology – or more accurate: 'hauntology' (Barad, 2010) – and dig further into the stickiness of this video clip. Why was it 'stuck', and what sticks out from staying with its stickiness?

What is sticking out?

One of the things that 'sticks out' is that this video clip is taken on a field trip to a beach. Education outside, in 'nature', is something quite different from education inside classrooms in a school building. Outdoor education might assume that nature is a good teacher for young humans who often are believed to be close to nature themselves ('wild' in fact) and need culture (adult

interventions and guidance) to mature and develop into cultivated, rational, independent adults (Murriss, 2016). What happens when education is moved out of the classrooms and even out of the school playground?

Re-turning to the event, Synnøve writes:

As we walk to the beach, we walk in a row and in pairs. The teachers are at the front, the assistant at the back. When arriving at the small beach, we all spread out like water and flood the beach. Large waves from a ship passing by crash against the shore. Waves, children, a ship, stones, shells, wind, laughter, and sweat intra-act in a kind of cat and mouse game. Children's legs are running towards the fjord, waves are pulling back and, as they crash against the shore, screams fill the air. Sticks and stones are touched by hands, lifted, carried, thrown and put in pockets. Leaves are torn, crumbled and tossed away. Some children are moving a lot and making lots of sounds while others are quietly sitting still. I sit still and I am silent myself. A girl comes over and shows me how the stones she has found resemble music instruments. "This is going to be a piano, this a flute and this a guitar," she says, mimicking the movements of playing the different instruments. "Are you going to make a troll-band?" I ask. "Yes", she replies and runs off.

Later, the same girl asks me if I want to do a 'course' with her. Not knowing what she means by 'course', I ask what that would involve and the girl explains that it is simply to follow her instructions and do the same as her. I agree to do this and end up mimicking the girl's dance steps and movements, some which are quite demanding and heavy. After a while, two other girls show interest in joining in and I seize the opportunity to step out of the course.

Just like the pupils seem freer to move, talk, laugh and scream at this beach than inside their classrooms, the teachers also seem freer to not intervene. As described above, the possibilities for communicating, being together, and intra-acting in the world was radically different than from the 'ordinary' days inside their classrooms, thus showing how the spacetime-matterings¹³ of education matters. Education done outside allows for different subjects and objects than inside classrooms.

When studying the relations of music and children in everyday life, the place of musicking is not fixed to a specific location, time or space, nor are the materials involved restricted to only involve what usually counts as musical materials (i.e. human-made musical instruments or human-made soundwaves of a particular kind). This research project explores what child-music relations can be/come and does not limit its focus to a 'music lessons' as, for example, included as a separate lesson in a timetable, nor does it already assume what counts as music, or where and how music occurs. Although, assuming that human people of a certain age are (by law) children, this study works with the postdevelopmental (Murriss et al., 2020; Osgood, 2023) idea that the concept 'child' does not refer to a human being of a particular fixed age or size (Murriss & Reynolds, 2023). By moving away from thinking about children as individualised small human beings and resisting

¹³Barad's (2007, 2014) concept "spacetime-mattering" emphasises how space, time and matter are not separate entities, but always becoming through iterative intra-actions.

analysing their actions as caused by internal motivations, it becomes possible to move away from deficit interpretations. This multiplicity articulates the complexities of life, which is also entangled with Norwegian ideals of childhoods spent by fjords, learning outside, being closer to and in touch with nature. It certainly does not resemble a 'normal' music lesson.

Throughout Synnøve's observations of the 4th grade's ordinary school days, what was articulated as music lessons in the school's timetable centred on activities such as learning songs, dancing, listening to recorded music, learning about the Norwegian composer Edvard Grieg (1843-1907)¹⁴, learning how to play the recorder and reading Western musical notation. In all these activities, the focus lies routinely on the human, and his or her individualistic traits and talents. Not only does this position the (adult) human as the 'site' of knowledge (Kvile et al., 2025), but the pupils are found wanting, like the 'developing child' (Murriss, 2016), while the teacher is 'completed' as the knowledgeable adult, i.e. the fully-human. As in any educational setting, the teacher-student relationship is seldom equal to begin with. Often, the asymmetry is not even questioned, but rather an assumed hierarchical structure the student must submit to. Stories from music educators (see e.g. Fjeldstad, 2023; Jenssen, 2023) articulate the potential for a music lesson either to lift the student or to crush them, and how the phenomenon that includes the music teacher, but also includes more apparatuses that measure (like 12-TET, timetables, developmental theories), perform ontoepistemic injustices in Western music education¹⁵. Instead of listening to what pupils and more-than-human agencies bring to music lessons¹⁶, listening 'as usual' continues to sediment music education as a practice exclusively by and for humans. In contrast, if we focus on the measuring apparatuses of music education and make an ontological shift, we listen to the entanglements. For agential realists (Barad, 2007), the ontological and epistemological starting points are the relations 'between' individuals and nonhuman others. Relations are always material-discursive and constitute the individual – not the other way round. The iPhone, our computers, we researchers, the children, the curriculum documents – we are all what Barad (2007, p. 148) calls apparatuses, that is, "the material conditions of possibility and impossibility of mattering; they enact what matters and what is excluded from mattering". They are open-ended practices without intrinsic boundaries. They are not passive instruments for observations, but part of the ongoing intra-activity of the world. In other words, the apparatuses produce the phenomena; the data did not exist prior to our conversations about it and our decision to write about it.

Resisting an anthropocentric lens, and not focusing on the humans, is indeed very difficult – it does not come 'naturally' and requires much un/learning. It includes giving up the idea that a

¹⁴Edvard Grieg was a classical composer in the national romantic era. Perhaps the introduction of Grieg to the 4th graders was related to the Troll-making project in Arts and Crafts since the musical piece they listened to was "Dovregubbens hall" (In the hall of a Mountain King). This orchestral music accompanies a scene from Henrik Ibsen's play "Peer Gynt" where the character Peer, in his own imagination, encounters a large troll.

¹⁵ Although Western music education practices in overall indeed are varied and can incorporate activities more akin to the purposes of community music (social justice, care, kinship) or music therapy (healing, self-expression), the point here is to stick to the specificity of this PhD's particular fieldwork which also produced the video clip. We are not trying to reduce music education to only encompass the activities found in the 4th grade's music lessons, but to discuss how these particular music educational practices offer some kinds of realities rather than others.

¹⁶ See Hauen (2024) and Jenssen (2024) for two beautiful examples of how this way of listening can be done in music lessons.

researcher can be an objective observer at a distance watching, recording and evaluating children's thinking or behaviour according to a predetermined framework of expectations and norms. In an effort to move away from focusing on 'subjects' and 'objects' (children, teacher, music, etc.), we have focused on the natureculture *relations* that bring forth the phenomenon in its specificity: sounds, stones, weather, discourses about animals and biology education, adult-child relations and so forth. In the final section of the article, we continue our diffractive inquiry through a re-turning (Barad, 2014) to the beach.

Re-turning and responding to the beach

When Karin visits Synnøve in Norway, we re-turn to the beach, pick up an almost transparent stone and hold it against the sunlight (Figure 3). It is "one of those life moments when the amorphous jumble of history seems to crystallize in a single instant" (Barad, 2017, p. 39).



Figure 3: Stone held against the sunlight, like a crystal

The different layers are dispersed as multiplicities in spacetime, formed by the ice age's glaciers. The radical political potential in LwO and diffractive methods lies in thinking about time anew – diffracting the past through the present. We un/learn and discipline ourselves not only to use a socio-cultural lens. The glaciers also stick out – literally; their tireless erosion of bedrock has carved

out deep, broad valleys, some which are filled by seawater, which has made Norway the land of the fjords and Vikings. Boats, 'mastering' the sea, humans and other animals living off the sea, travelling, exploring, discovering, fighting, conquering and surviving are all spacetime-matterings that entangle with this field trip. We are attuning to the historicity that is threaded through the field trip through "responding to the parts of the world the research brings into being" (Fjeldstad, 2024, p. 9). By responding to the stones, noticing and becoming affected by them, carefully listening to their entangled relations, we are doing a LwO kind of listening that renders the 'other' (stones, beach, glaciers, fjord, Viking history, fishing community) capable. Flint (2022) argues that:

What we attune to, the resonances we listen to, how we listen, not only shapes our perceptions of places and spaces, but shapes our engagements with those spaces and places, shaping them in the process. What we attune to matters, because it shapes how we are responsible to places and spaces, our relations of becoming together (Flint, 2022, p. 537).

Taking Flint's argument, as teachers, what we attune to and how we listen to the video clip shapes how we then respond, because part of intra-active worlding practices might, or might not, include us humans as part of that intra-active entanglement. Attuning to what is in/out of tune, paying attention, using all of our sensorial bodies, means incorporating material-discursive factors but also technoscientific and natural factors. Also, we have argued that what constitutes the 'natural' or the 'cultural' is also part of our investigation, which we have claimed is 'objective' – a posthumanist reconfiguration of the concept. Although we have not yet focused on these material-discursive dimensions, objectivity not only includes paying attention to the age of the children, but also their gender, race, sexuality, religion and nationality, as well as class. They all matter when analysing, e.g., the practices of fishing communities, their livelihoods, gendered relationalities as well as the apparatuses that measure, including the researchers' own subjectivities. Video and sound-recording devices are not simply innocent instruments that record how things are in the world independent from human interventions. They are materially implicated in the production of new knowledge and mobilise new social and cultural relations (de Freitas, 2016, p. 554). The concept 'new' is an interesting and complex one in agential realism. Does our analysis offer anything new? Maybe this is the wrong question to ask. In agential realism, anything new is always porous, because it is connected to a past (to be recognised as something), but also disconnected from it (to count as new) (Juelskjær & Schrader, forthcoming). So, if not new, what does it offer to music educators and practitioners?

By paying attention to how one video clip was brought into existence in its specificity, we tune into the colonial relations between humans as well as between humans and the more-than-humans already implicated in the clip. When we listen to the video clip as a phenomenon and let it respond by diffracting through multiple temporalities and spaces, we can "hear/see/feel what sound is doing" (Flint, 2022, p. 11).

In the process of writing at Synnøve's house, Karin and Synnøve's daughter, go for a morning swim in the fjord. Karin makes a recording of the sounds of the birds, the beach, the sea water, waves, breeze, etc., with the intention of diffracting these sounds through the article. While recording, a

strange bird makes its appearance. Have a listen (Figure 3):

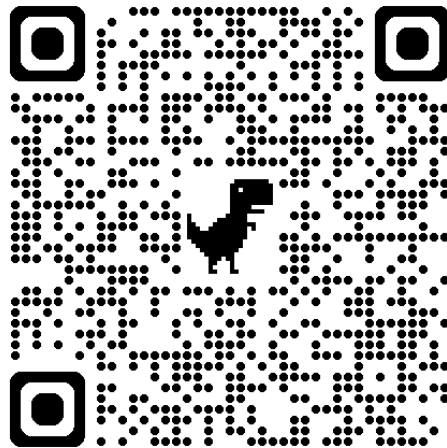


Figure 3: QR-Code to [audioclip of Waves and Birds](#)

Turning around to 'see' the sound/bird, Karin notices that it is Synnøve's daughter who is imitating bird sounds. Turning the stone against the light, her voice is crystalised, entangled with the agential realist analysis of the Mini-Trolls video clip. Back in the house, when playing the 'bird' recording to Synnøve, she comments that it sounds like a baby bird (not knowing it was her daughter): the bird is singing out of tune, like baby birds do – they haven't learned how to sing 'properly' yet. When Karin tells the story, they giggle and enjoy tuning into this 'bird' being out of tune – but very much in tune with Listening without Organs to Karin's movements on the beach. Analysing Synnøve's daughter-as-a-phenomenon – posthuman child (Murris, 2016) – enables children to respond as able and (already) of culture, thereby de(con)structing the adult/child binary.

The video clip of Mini-Troll is not innocent, but always political in the sense that lenses do not simply reproduce and represent (Cole & Bradley, 2016, p. 7). By inviting a multiplicity of child humans and more-than-humans to join us in the storying, the role of the more-than-human in music education is reconfigured. Moreover, this kind of storytelling disrupts many binaries and representational writing practices in its materiality. Each re-turning is a differentiating, worldmaking process, sedimenting the world in its iterative becoming (Barad, 2007). By replaying the video clip over and over again, we have started to trace bodies of any kind and size as phenomena, ontologically and deliberately.

The iterative and diffractive engagement with/in the sticky complexities provoked by the open, dispersed/diffracted moments of the video clip involves (and continues to involve with each encounter) not only cognition, but also a be(com)ing affected by the experiences of bodies always already in relation, as well as creating new connections. The effect of these interference patterns or superpositions cannot be contained, is often not articulable or expressible, and may even be beyond words. By sticking with writing as a worlding process and staying with the trouble of what stuck and is sticking out, what has been brought into existence is a stretching of our concept of music as well as music education. The analysis in this article remains temporally open, drawing our

attention to it again and again and also connecting with you, the reader(s). This 'meeting' of sorts will stick and leave permanent traces with/in the world (not just in your, or our, minds or brains). In this ongoing worlding process, the past is never closed. Each re-turning is a differentiating, world-making process that 'we' as writers are simply part of. We cannot oversee it from a distance and then 'map' it as part of a conclusion – it continues to reverberate. The world and its possibilities for becoming are remade in each 'meeting'. Justice is not a state or an endpoint that can be achieved once and for all. As an iterative worlding practice, we need to attune to questions that disrupt the power-producing binaries reproduced by listening-as-usual.

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