


Playing in the gym, boxing in the classroom: A diffractive approach to music, embodiment and affect in childhood

Jugar en el gimnasio, boxear en el aula: Un enfoque difractivo de la música, la corporeidad y el afecto en la infancia

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Abstract

Embracing the more-than-human paradigm in educational research allows to attend the intricacy and multiplicity of classroom situations. This research focuses on a music event in a primary education classroom in which several agents intertwine. Thinking-with-theory upon this event allows us to create new knowledge and to avoid limiting strategies that often insist on what is already known. Data is presented as an audiovisual vignette, and a multi-layered diffractive analysis is applied, where bodies, sound, movement, and memory entangle, and where affective encounters in/through music emerge. Each diffraction enables us to regard the event from multiple lenses, drawing on more-than-human and neo-materialist concepts such as affect, spacetime mattering and intra-action. Through this analysis, the research delves deep into the convergence of materializations and embodiments within a child's apparent distraction, revealing the nuanced ways in which children derive meaning through their bodies, sound, space, memory, and affect. In this process, it is possible to reflect beyond representational logic perpetuated by adults and teachers at school, and to attain a deeper understanding of the embodied essence of meaning-making. We provide insights into how children make meaning in/through/with bodies, sound, space, memory and affect, and how they escape the fixed relations of the classroom as proposed by adults/teachers.

Resumen

Adoptar el paradigma más-que-humano en la investigación educativa permite atender a la complejidad y la multiplicidad de las situaciones que se dan en el aula. Esta investigación se centra en un evento musical en un aula de educación primaria en el que se entrelazan varios agentes. Pensar-con-la-teoría sobre este acontecimiento permite generar nuevo conocimiento evitando estrategias de lenguaje reductivas que a menudo conducen hacia lo ya conocido. Los datos se presentan como una viñeta audiovisual, y se aplica un análisis difractivo de múltiples capas donde cuerpos, sonido, movimiento y memoria se entrelazan, y donde emergen encuentros afectivos en/a través de la música. Cada difracción nos permite contemplar el acontecimiento desde múltiples ópticas, recurriendo a conceptos más-que-humanos y neomaterialistas como la difracción, el afecto, la dispersión espaciotemporal y la intraacción. Mediante este análisis, la investigación profundiza en la convergencia de materializaciones y corporeizaciones dentro de la aparente distracción de un niño, revelando las formas en que los niños generan significado a través de sus cuerpos, los sonidos, los espacios, la memoria y los afectos. En este proceso, es posible reflexionar más allá de la lógica representacional perpetuada por los adultos y los profesores en la escuela, y alcanzar una comprensión más profunda de la esencia corporeizada de la creación de significado. Aportamos ideas sobre cómo los niños crean significado en/mediante/con el cuerpo, el sonido, el espacio, la memoria y el afecto, y cómo esto escapa a las relaciones fijas del aula propuestas por los adultos/profesores.

Keywords / Palabras clave

Education, Childhood, Learning processes, Sound, Music, Classroom, Literacy, Play.
Educación, Infancia, Proceso de aprendizaje, Sonido, Música, Aula, Alfabetización, Juego.

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1. Introduction: The more-than-human turn in educational research

Research has addressed the emergence of posthumanism as a way to understand the contemporary world (Braidotti, 2013), the relevance of matter agentialities (Murriss, 2022), and the idea of the child as full and able when we decentre the focus from the humanistic binaries (Murriss, 2016). Therefore, posthumanism has been described as an ethic-onto-epistemological way of thinking which requires engagement with reality by doing, being and knowing (Kuby and Rowsell, 2017). Being a complex and multidimensional concept, posthumanism is related to other theoretical and poststructuralist theories, such as new-materialism, affect theory or more-than-human thought. Whereas posthumanism comprehends several theories that reject human supremacy beyond other entities, the more-than-human approach considers things to be the result of the coexistence of a boundless diversity of bodies (Price and Chao, 2023). In our research we adopt a more-than-human thinking, as it stresses on the multiplicity and fluid nature of worlds, where human beings are deprived of any superiority (Tsing, 2015).

The more-than-human lens in research aims to decentre the (white, cisgender, middle-class, European) human, and more specifically challenges an idea of human 'as fixed and neutral' (Hackett, 2022, p. 247). More-than-human research in education has offered new perspectives in fields such as literacy studies (Hackett and Somerville, 2017; Murriss, 2016), social sciences (Adams and Kerr, 2021) or sonic studies (Gallagher, 2016). In this context, our research follows the path laid by Elwick et al. (2019) or Wargo (2018), who posit the need for more research in music education from a more-than-human and new-materialist perspective. This approach may shine a light on the subtle networks of relations taking place around matter, music and childhood, which may be shadowed by other theoretical approaches focused only on the human.

2. Theoretical Framework

2.1. More-than-human intra-actions in the classroom

More-than-human thinking puts mind and body on an equal footing. Bodies are considered as a whole, erasing 'the natural and fixed dividing line between interiority and exteriority' (Barad, 2007, p. 136). They have memory and react beyond the power of mind, and their sensitive capacities define cognition (Dernikos, 2020). Accordingly, the world is understood with, in and through bodies, and the experience of reality is 'embodied' in constant intra-action between human and non-human (Lenters and McDermott, 2019). Bodies acquire an abstract dimension based on their indeterminacy and may be described as 'part of the self, being, becoming' (Zhang, 2022, p. 1). From this perspective, bodies defy the language-based model of society, in which children are 'not-complete' until they reach a mature level of verbal communication (Murriss, 2016). More-than-human thought of/about/with bodies lets us notice children's bodies as sensing, relational and thoughtful entities (MacRae, 2020), valuing their material, non-representational and non-linguistic ways of meaning-making (MacLure, 2016).

Through the more-than-human lens, human and non-human operate at the same level, and the world is created in their intra-actions. Like Barad (2007), we avoid the term 'interaction', that would entail agency coming from outside, and adopt 'intra-action', which carries the sense of emergence from the inside. Intra-actions erase the boundaries between object and subject, as agents do not pre-exist subjects (Guyotte et al., 2020). More-than-human agents, on the contrary, come-to-be and become entangled in a constant and dynamic process of creation (Kuby and Rowsell, 2017), where matter is something that 'becomes', instead of something that 'is' (Coole and Frost, 2010). Thus, causality is not a linear sequence of cause and effect, rather it must be reconsidered starting from intra-actions. For instance, in a classroom setting this intra-action may take place involving 'a coat, a chair, a pen, an iPad, a computer screen, the atmosphere, the temperature, just as much as any human' (Taylor, 2016, p. 17).

Intra-actions emerge as unintentional processes of meaning-making, the unpredictable consequences of the relations between matter and discourse, and the energies and potentialities generated within them (Hackett et al., 2017). These unexpected emergences may be shaped as distractions. In this sense, distractions in educational contexts, especially in those related with arts education (Hackett et al., 2017), have been regarded as unplanned emergences, potentially valuable for education (Rautio, 2018). Distractions from teacher-led classrooms and planned learning tasks open up possibilities of a non-linear understanding of education (Springgay, 2020). In them, children's refusals to follow the path designed by adults have been described as opportunities for exploring affective relations in childhood, and as 'a space for something else to take shape' (Truman et al., 2020, p. 234).

The more-than-human view of education challenges the predictability and linearity of educational processes led by a human/adult/teacher. It has enabled new possibilities for addressing what happens in a classroom (Kuby et al., 2018) where, traditionally, teachers and education systems design and organise a human-centred learning (Murriss, 2022). Moreover, there is a concern regarding the relations between the students and the non-human world around them, or the agentialities of non-human bodies (Powell and Somerville, 2020). Paying close attention to the more-than-human world in the classroom enables researchers and teachers to understand the ways in which children intra-act with bodies, matter, time, and space, and 'can lend us insights into understandings about children and childhoods often obscured by our assumptions and desires' (Yoon and Templeton, 2019, p. 57).

2.2. Sounding/ed affects and moving memories

Affect has been defined as the capacity of affecting and being affected in a reciprocal and relational way, something found 'in those intensities that pass body to body (human, nonhuman, part-body, and otherwise)' (Seigworth and Gregg, 2010, p. 1). We adopt this neo-Spinozan approach to affect, an intensity characterised as a relational and social force (Deleuze and Guattari, 2004). In it, affect emerges in between the human and non-human, triggering connections and entanglements (Barad, 2007). Affect moves, is embodied, and shows how experience is transmitted physically from one to another (Hackett et al., 2017). The idea that everything in a molecular level is vibrating (Bennett, 2010) can lead us to consider that all bodies, ecologies, feelings, experiences, and events have the potential to affect others (Gershon, 2013). Moreover, embodied affect leaves a trace that constitutes the memory used by bodies to 'bring up to date the present' (Massumi, 2015, p. 8).

One of the bodies moved in/by affects is sound (Gershon, 2016). More-than-human research has attended to sound from two perspectives: as a phenomenological agent, in which sound is a vibration across bodies, and as a social agent, described as a relational force (Wargo, 2018). In this second sense, sound possesses an affective charge and may be defined as a resonant force able to move bodies (Gershon and Appelbaum, 2020). Gallagher (2016) has described sonic affect as the vibrational intensity of all bodies, human and non-human, entailing other sound layers that can be activated, related to feelings, meaning, cognition and memory. Bodies are affected by sound owing to the vibrational potentialities of corporeal and sociocultural means (Henriques, 2010). Thanks to this force, sound is a breeding ground for the emergence of events (Wargo, 2018), such as those related to movement and kinetics. Hackett, MacLure and MacMahon (2020), for instance, considered sound to be a key agent when they explored how the outdoors in school spaces triggered meaningful relations between children, matter and senses. Thus, bodies are also unfolded into sound, moving them to new fields and empowering multiplicity (Dernikos et al., 2020). Sound can also be seen as a carrier of meaningful vibrations that, unlike words, conveys representational and non-representational codes (Gallagher et al., 2018).

Posthuman research has linked sound and movement, considering them as 'world forming practices' (Hackett and Somerville, 2017). They have been also described as 'knowledge in motion' (Wargo, 2017), and essential to understand children's becomings (Yoon and Templeton, 2019). Accordingly, movement has become essential in the reading of phenomena from a more-than-human perspective. It has been described as unpredictable and rooted in a continuous entanglement with the environment (Hackett and Rautio, 2019). In a school context, the classroom has been analysed regarding its restrictions to movement (Kirby, 2020), which hinder the dynamic intra-actions of spaces and bodies (Dernikos, 2020). As Powell and Somerville (2020) state, movement, sound, matter, and bodies connect to enact learning and being, as part of an intra-active and never-ending meaning-making process. Children-objects and elements-movements collectively produce sounds, vibrations, rhythms, and intensities in which valuable meanings are made (Powell and Somerville, 2020). Furthermore, the more-than-human approach to movement, sound and education offers new insights into the ways in which children materialise music in school settings (Gershon, 2018). What in the beginning could be considered to be a mere distraction reveals a complex network of actions in which memory, affect, matter and sound are intertwined (Springgay, 2020). In this way, more-than-human readings of classroom phenomena lead us closer to children's meaning-making processes, understanding knowledge as emergent and embodied and 'not restricted to bound individual or subject silos' (Burnard et al., 2021, p. 117).

Space, time and matter coexist as inextricable and non-linear agents (Barad, 2007). According to Barad, 'the past was never simply there to begin with, and the future is not simply what will unfold; the "past" and the "future" are iteratively reworked and enfolded through the iterative practices of spacetimemattering' (2013, p. 28). Considering that the world is in a constant state of 'becoming' in which space and time are reiteratively materialised, the role of memory itself is unstable and troubled. Memory can be understood not just as a way

to represent past moments in the present, but as the reconfiguration of past in the present and the understanding of 'ongoing openness of the narrative to future retellings' (Hristova et al., 2020). This ontological conceptualisation of memory highlights its emergence as something unconscious, visceral, and intrinsic to bodies (Hackett et al., 2017), connecting past, present and future.

We can conclude that sound, like affect, is dynamic and transient, and can only be recognised in the moment and through the reactivation of the embodied memory in/with sound (Revill, 2016). According to Henriques (2010), 'affect is expressed rhythmically' (p. 58) and can make previously acquired knowledges clear for all to see through the nonconscious memory of the body (Gershon, 2013). These knowledges are part of bodies' history, understanding history as the emergent record of human and non-human intensities that overlap (Tsing, 2015). Tsing used matsutake mushrooms to illustrate those material 'tracks and traces' (2015, p. 168) which remain in bodies, fostering entanglements and taking part in memory. As Tsing explains, mushrooms become part of the trees they inhabit, and their remains come-to-be traces speaking of their past and future. Thus, embodied memory is entangled with place, time, movement and meaning-making (Hackett et al., 2020).

More-than-human theory provides a complex framework in which meaning-making may be fostered through the intra-actions and affective encounters taking place in a classroom setting. Within this conceptual frame, our general aim is to look at children's school practices through a more-than-human paradigm, attending to sound, movement, and memory. More specifically, we aim:

- to explore the possibilities of diffractive analysis in addressing the intra-actions of children, bodies, sound and memory in a primary school classroom, and
- to (re)consider affective encounters in childhood as non-representational ways of meaning making in/through music.

3. Methodology

More-than-human thinking is both a theoretical framework and a methodological approach that rejects representationalism and challenges the constraints of traditional qualitative methodologies. As a method, it tries to overcome the ontological attitude adopted by researchers who assume the role of individual and external observers as they look upon the world from outside (Hackett and Rautio, 2019). In the representation of reality, researchers build barriers between objects and identities, thus creating dichotomies and hierarchies of values opposed to movement, change and emergence (MacLure, 2013; Shannon and Truman, 2020). On the contrary, we consider ourselves as entangled with inquiry, and our intra-actions create knowledge far beyond the use of representation through verbal language and interpretation (Kuby and Rowsell, 2017). Data in this research is considered a construction, the materialisation of an assemblage composed by human and non-human agents that is subject to our experience as researchers who are part of the event (Ellingson and Sotirin, 2020).

Our analysis is framed within a wider project developed over two years in low-income schools in the south of Spain. This project applied a classroom ethnography design (Green and Bloome, 2005) and involved a team of three researchers participating in the classroom tasks, interacting with the children and designing specific actions. The children's parents, teachers and school were aware of the research's aims and scope, and signed an informed consent agreement, according to the policies of the University of Seville. All the names in this article are pseudonyms.

From all the data gathered, we have selected a tiny scene from a music lesson. It took place in the second year of our project, when most of the children were six years old. The scene was video recorded on a mobile phone by one of the researchers sitting at the back of the classroom, which the researchers considered to be less intrusive for the children. Data from this recording were combined with the researchers' field notes and conversations with the children and their teacher, Virginia. When Virginia started her work with this group in the previous year, she made an effort to improve the children's behaviour in the classroom, such as by encouraging them to raise their hand before speaking, keep silent and sit still. By the time this scene took place, the children were familiar with these requirements.

Our initial aim when we recorded the session was to focus on the teacher. However, as we noticed what was happening in the back rows, we shifted our gaze to the children's divergent actions. In this process, we assume our role as data-involved researchers, as our vision was never innocent or objective (MacLure, 2013). It was

during the revision of our data from a more-than-human lens that we noticed the subtle network of intra-actions taking place, and the clues it provided regarding the children's response to music in the classroom.

Our analysis applies diffraction as a way to attend to the multiple layers of reality (Barad, 2014; Murriss and Bozalek, 2019). The concept of a diffractive approach comes from quantum physics and, as explained by Karen Barad (2007), implies that one single event may be broken down into different, overlaying parts, in the same way in which light is spread (diffracted) when it encounters certain objects. Diffraction considers the multiple layers concurring in an event (Barad, 2007), described as the intra-action between materiality and discourse (Jackson and Mazzei, 2023; Murriss and Bozalek, 2019). In Barad's words, diffraction means thinking 'constructively and deconstructively (not destructively)' at the same time (2014, p. 187), similar to the many thin fibres comprising a strong rope. This attitude towards analysis avoids building hierarchies between the perspectives overlying in the event (Jusslin and Østern, 2020) and implies attention to minor details (Barad, 2007).

We also apply diffractive analysis as a way of 'reading the data while thinking with theory', aiming to produce new knowledge while avoiding reductive language strategies (Jackson and Mazzei, 2023). Thinking with theory also enables us to create new connections between the phenomenon and the diversity of perspectives that enhance the researchers' insight. Ultimately, diffractive thinking offers new lenses that contribute to understanding the intensities beyond the power of conventional qualitative methods (Murriss, 2021).

4. Results: A vignette

In our analysis, we focus on the vignette contained in the opening bars of this article. However, we acknowledge the limits and constraints of words as means to represent the world. The vignette is therefore complemented by its recording (Figure 1) from the researchers' device/lens, and along with the written text, is the departing point for our diffractive reading with theory.



Figure 1. Phenomenon's video recording: <https://shorturl.at/dprwH>

It is Wednesday, 9.30am. The children are sitting in pairs in the classroom, looking at the blackboard and the digital blackboard. We call it a digital blackboard although in fact it is an A2 sized sheet of white paper taped to the wall. Today's lesson topic is the letter 'z'. Virginia wants to improve the writing and reading skills of her pupils and she frequently uses music to reinforce their literacy skills. She asks the children to watch a YouTube animated video, consisting of a brief explanation of the letter and how to write it, some words including it, like 'zoo', 'Zumba' or 'zone', and a final song. Virginia has used this kind of video very often, and every time the children watch a video, they learn to sing the final song and copy the moves and gestures. From the back of the classroom, I can see Martin sitting two rows in front of me. Although he usually tries to engage in the classroom activities, he gets distracted easily. At home he stays up late watching TV or playing videogames. Today he seems restless; he fidgets at his table or at the tables close to him, swinging on his chair and trying to talk with his friend sitting behind him. Virginia seems to pay no attention to him, and she goes on with the lesson asking the children about their favourite place to play. She asks all of them, one by one, and Martin says he likes to play boxing at the gym. As Virginia continues asking the other children, he starts to move like

he is boxing. When the song begins, Martin starts dancing like he was boxing: fists above the chin height, knuckles facing upwards, raised shoulders and sometimes throwing punches in the air. At Virginia's request, the children propose some gestures to accompany the song's lyrics: animals in a zoo going to Zoe the zebra's Zumba lesson. Martin proposes some movements mimicking a duck, but Virginia chooses another child's suggestion. Martin continues boxing and moving his head to his right, as if dodging a blow. The children start singing the song and doing the gestures at the same time. Sometimes Martin starts to join in, but he goes back to his boxing. Danny, a friend of Martin sitting in front of him, tries to imitate his movements, but not for long. Some other children encourage Martin to sing and copy the song, but he pays no attention. The children spend about ten minutes learning the song and singing it along with the video. After that, Virginia moves on to the next task.

5. Diffractive analysis

Primary education classrooms are full of moments like the one depicted in this vignette. A child moves, acts, or answers on his own, regardless of the teacher's instructions. Most of these events take place unnoticed and are left aside, considered as brief breaks in the school activities. In our research, we embrace Mazzei and Jackson's concerns (2023) about 'thinking otherwise' in educational research, and we move towards a more-than-human reading of this vignette. Through a diffractive multi-layered analysis, we read it with theory and delve into the multiplicity of agentialities, embodiments and affects that emerge when we apply an otherwise lens.

5.1. First diffraction: Sound and music agentialities

The phenomenon in our vignette gathers the intra-actions of bodies, Martin, music, children, the teacher and the classroom. Our vignette comes-to-be in Martin's embodied materialisation of the video's song, which raises questions about the phenomenological nature of music. Music exemplifies Rousell's (2019) concerns about artworks as the representation of the artist's will. In this sense, artworks are representational in essence, determined by the humanistic logic of binaries (artist-public, mind-matter, idea-representation). The song in our vignette and its intra-actions in/with the classroom has an agential dimension that detaches it from this human/artist-centered perspective. Therefore, we envisage music as equating to sound, vibration and resonance, according to Powell and Somerville (2020, p. 846): 'We consider music in its "rawest" form as an integral participant in the more-than-human world'.

In the intra-action of Martin and the song, music becomes a more-than-human agent in the classroom and, together with Martin's movements, and it enables the emergence of a newly created world in the classroom (Thompson and Biddle, 2013). As we shift our focus from Virginia's suggestions towards Martin, this intra-action emerges as a new layer in the classroom. The multidimensional spaces cohabiting the classroom defy the linearity of space and time in educational settings (Murriss and Kohan, 2021). Moreover, children's perceptions of time and causality challenge linearity (Kuby et al., 2018) and, thus, 'throughout children's lives their language and literacy development is enhanced by non-linear approaches characterised by creative practice, rather than the overemphasis on linearity and chronology that pervades educational discourse today' (Hackett and Somerville, 2017, p. 388).

Martin's movements to the song are not aligned with Virginia's aims when she asks the children to suggest some gestures. The iteration of the classroom dynamics made it easy for the children to understand what was expected from them (Brownell, 2019), namely, to sing the song along with movements related to its lyrics. Given his awareness of that, Martin's suggestions match these expectations and contradict his own boxing practice. In this renunciation of his own embodiment of the song, as well as in the other children wanting him to follow the rest of the classroom (Figure 2), power relations emerge amid intra-actions with sounds and the way in which sound should be materialised (Gallagher, 2011).



Figure 2. Martin's classmate urges him to follow teacher's choreography

5.2. Second diffraction: Affect and embodied discourses

The intra-actions in the classroom may be described, following Massumi (2015), as an affective encounter emerging unexpectedly. Martin is affected by the music, as he is compelled to move when he listens to it. Music is affected in Martin's movements, sparking a new set of meanings distanced from songs used at school to learn grammar. As described by Dernikos et al. (2020, p. 6), affect, conceived as a bodily impulse, 'can start out as a sensory experience or charged habit, but then, quite unexpectedly, surge up in ways that intensify the capacity of bodies to act and be acted upon'. Thus, the music in the video embraces Martin's experience in the sports centre when he boxes. Affect, as an intensity in its Deleuzian conception (Buchanan, 2021), acts as a relational force that involves other more-than-human bodies (the boy in front of Martin when he tries to move as he does [Figure 3], the boy on the right, the table, the chair, the song, the researcher's perspective). They become entangled in what may be named an assemblage, according to Deleuze and Guattari (2004), formed by bodies linked in intensities and affect in a dynamic and ever-changing way (Buchanan, 2021).



Figure 3. Danny joins Martin and starts doing boxing movements

The intensities and affects linking the more-than-human bodies in this assemblage are not linguistic. Instead, they arise in movements, gestures and expressions, set by/among/with the children, and detached from the teacher's linguistic discourse. These embodied intensities have been related to the ways in which children make meaning in the classroom (MacLure, 2016), and challenge the bodily and spatial restrictions of the school context (Kirby, 2020). In our vignette, movement is limited by the classroom layout, with children sitting facing the teacher and the screen. The more-than-human value of the ways in which children think with bodies (Hackett and Rautio, 2019) leads us to consider Martin's assemblage with music, table, and other children as

an embodied emerging world (Hackett and Somerville, 2017), that overlaps adult linguistic supremacy (Yoon and Templeton, 2019).

The linguistic adult approach is followed by Virginia in her instructions to the children, related to the notion of 'symbolic play' (Ruiz and Abad, 2011), where movement is supposed to 'represent' the song's lyrics, thus creating a binary of lyrics/music. Representational thinking establishes a unique way to live predetermined forms of learning experiences (Rousell, 2019), where learning is a linear and unidirectional process (Zembylas, 2016). Therefore, Martin's movements don't fit with Virginia's idea of being a 'duck' ('in the duck zone', in the song). Dernikos (2020) defined these decisions about what could be learned, said and done as 'doing school'. Virginia is 'doing school' through the spatial relations she fosters (or not) during the activity, and also through movements and sounds involved in the classroom dynamics. All in all, this phenomenon underscores the classroom hierarchies between proper and non-proper responses to representational ways of understanding music and movement (MacLure, 2016).

5.3. Third diffraction: Traces of a non-linear memory

Karen Barad's agential realism rejects the idea of linear causality and asserts that humans are no longer 'pure cause or pure effect' (Barad, 2007, p. 136). However, memory has a relevant role in affects (Dernikos, 2020) and may be associated with the traces left behind (Tsing, 2015). Accordingly, 'the world "holds" the memory of all traces; or rather, the world is its memory (its enfolded materialization)' (Barad, 2013, p. 29). The traces of boxing emerge in the classroom as Virginia asks about her students' favourite place to play, and Martin answers that he likes boxing at the gym (Figure 4).



Figure 4. Martin answers to the question: 'What is your favourite zone for playing?'

Traces of boxing become present in Martin's movements, along with reminiscences of the new Fortnite boxing choreography launched a few days before, and memory weaves with movement and bodies, as well as sound and music (Revill, 2016). In our vignette, Martin moves like boxing before listening to the song, and the song re-activates movement when its momentum seems to fade. Traces are not a linear sequence, or a cause-effect connection. Rather, the video's song, Virginia's questions about playing, movement and more-than-human bodies are a non-linear becoming of traces. Martin's memories become present in the classroom, and these 'traces' come-to-be in their materialisation with music and sound.

According to this non-linear perspective of memory, Virginia's question does not unleash movement, because it is already present. Thinking with Massumi's (2015) conception of memory, Martin's embodiments are an activation of future memory by/with/in the music (Jackson and Mazzei, 2023). Memories are made by Martin in the present to be used in the future when the present will be past. Memories remain embodied in Martin, like traces 'waiting' to be triggered by a future intra-action with 'letter Z', 'boxing', 'the duck zone' or the Zumba music, transcending and transforming space, time and matter/sound (Hristova et al., 2020).

5.4. Fourth diffraction: Distractions and the emergence of the unknown

The classroom in which this phenomenon takes place, its furniture and even the children's movements, can be recognised as part of a 'constrained' system (Kuby et al., 2018, p. 152). Children remain seated and are allowed to move the upper part of their bodies and their feet. Movements are controlled and organised by the

teacher, who decides which ones are permitted and which are not (Gallagher, 2011). Although Virginia doesn't sanction Martin's movements, this spatial restriction is understood as natural by the children when they urge Martin to follow the movements proposed in the classroom, or when he himself suggests more acceptable movements. Snaza and Sonu (2016) have highlighted the implicit ideology of the limits in this asymmetry of student and teachers in terms of space and movement: 'the teacher controls and the students are controlled; the teacher knows and the students are deficient in knowledge' (p. 34). Differing from the teacher's expectations may therefore be considered as 'bad behaviour' (Snaza and Sonu, 2016). Movement limits and restrictions may be regarded as a colonised understanding of what is suitable for the classroom (Dernikos, 2020), and end up with Martin's non-representational embodiments being left aside.

More-than-human research does not recognise distractions as a sign of disruptive behaviour but regards them as a part of emergent systems to be embraced (Rautio, 2018). Attention to distractions may highlight the different ways in which learning is produced in the classroom. There, students may be bored or distracted, and at the same time they are being creative (Gershon, 2018). Martin's materialisation of music, memory and affect helps us to immerse in children's world-forming practices, especially when they do not follow the teacher's purpose and challenge what learners should do (Boldt and Leander, 2020). Memory, movement, and music emerge in Martin's embodiment and subtly defy the task proposed by the teacher, detaching the song from the iterative and tamed school practice (Springgay, 2020). Martin doesn't manage to sing the song or to perform the gestures accepted by the teacher. However, he is not refusing the activity or the music, he is proposing something that diverges from the teacher's representational thinking, thereby generating meaning and knowledge in the process (Truman et al., 2020). Affect and intensities guide Martin's meaning-making towards a view far from the colonised, linear and unidirectional learning archetypes of school (Dernikos, 2020).

6. Conclusions

The diffractive analysis performed in this article has underscored the ways in which sound articulates the affective encounters and intra-actions emerging in the classroom. The many layers conveyed in this phenomenon (re)configure the world, in a way similar to that described by Jusslin and Østern (2020). Among these layers we find Virginia's task, Danny's mimicking of Martin's movements, the memory of boxing and the Fortnite choreography, the spatial restrictions to movement, or our presence at the back of the classroom. Their entanglement gives way to a network in which all the agents be-come in the intra-actions, and are re-materialised in their connectivity.

The re-configuration of space brings out the multiple ways in which memories emerge and disappear simultaneously in world-forming processes led by movement (Hackett and Somerville, 2017). Matter/sound are also reconfigured when Zoe's Zumba is no longer a song for learning the letter 'Z', but a song in a gym. In the intra-actions, Zoe's Zumba has become part of an entanglement of connected spaces and memories, a Fortnite experience, boxing and movement. Space, time and matter cannot be separated because they are entangled (Kuby and Rowsell, 2017), like Martin's embodied memory which merges past, present and future. Our diffractive analysis highlights how the distraction in our vignette becomes a way of meaning-making and being-in-the-world for Martin. We assume that in distractions, children avoid reproduction and are open to new becomings (Truman et al., 2020) which conflict with the adults' understanding of the world in which they are mere recipients of inputs designed by the educational system and transmitted by teachers (Murriss, 2016). In contrast, we propose more-than-human bodies (sound, tables, light, children) as agents that intra-act with the children in their meaning-making. Thus, we consider sound in the educational context as an affective force that goes beyond the idea of sound as a product of disruptive behaviours or as a 'distraction to learning or other significant educational ways of being' (Gershon, 2018, p. 27).

In affective and embodied encounters, children challenge the representational understanding of music and sound. The representational intentionality of adults (like Virginia's aim to represent lyrics with specific movements) clashes with embodied, affective, emergent and trace-based ways for children to be-in-the-world. Attending to more-than-human bodies as discourse leads us to understand the non-representational ways in which children make meaning, where affective intensities become agents and replace the linearity of the word-gesture sequence. In this sense, affective and embodied intra-actions in the classroom become an opportunity for 'interrupting and remodulating dominant modes of power and rigid normativities' (Dernikos et al., 2020, p. 19).

The diffractive reading of the classroom's phenomenon may help teachers to reconsider all the intra-actions that converge in daily learning situations (Burnard et al., 2021), beyond the human-centred and teacher-led

practices. This relational perspective of education leads “to the construction of a fairer educational system that favours overcoming barriers based on race, gender or age” (Torres-Bejines et al., 2024). Valuing more-than-human affective intra-actions provides teachers with a better understanding of children’s being-in-the-world; a focus on children’s non-representational and embodied experience of sound may lead to more inclusive and children-centred classroom practices.

While this research allowed us to look at classroom situations otherwise, it is relevant to acknowledge some inherent limitations in it. The first one is the nature of post-qualitative method itself, which implies an approach to data in which the researcher is part of the phenomenon. Although we are exerting an influence on children recording the session, the researchers’ participation in the event is limited to the back of the classroom, with a limited perspective and agentiality in the event that constrain our immersion as researchers in the phenomenon. Different intra-actions could have arisen if researchers were next to children, dancing, or taking decisions about the course of the class. The second limitation, being at the same time an invitation for further research, is the scarcity of specific research analysing music in educational contexts from a more-than-human lens. In this sense, ‘thinking-with-theory’ feeds on existing conceptualisations and reflections as sources for reading otherwise. The lack of literature focused on music and childhood suggests that many elements remain unexplored and, in so far as this field is being developed, enriching lectures will emerge regarding music/sound and memory, embodiments, matter and discourse.

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