Reimagining Collaboration Through the Lens of the Posthuman: Uncovering Embodied Learning in Noise Music

While education research has largely avoided posthumanist scholarship, this analytic lens challenges the ways in which researchers have conceptualized educational technologies, i.e. collaboration and embodied learning, as primarily humanist endeavors that overtly center on human subjects within educational processes. By exploring sites of research that overtly enact posthumanist conceptions of learning, education researchers can address this oversight. In this article, I investigate posthumanist collaboration within the noise music genre, positioning noise music as a posthuman musical tradition and, in turn, a posthuman educational context. In doing so, I reframe noise (in the broad sense of the term) as a tool for engaging the posthuman through multiple educational praxes both in and outside of this specific genre. To construct this argument, I place extant literature on posthumanism and noise in conversation with descriptions of performances from the 2017 Experimental Education Series, a quarterly workshop and concert series that features a broad spectrum of noise musicians, and interviews with teaching artists from this series. Through this constellation of texts, I advocate for noise music to not only serve as a site for future research but as a potential model of posthuman education more broadly.

Keywords: posthumanism; collaboration; noise music; affective theory; embodied learning

Introduction

In writing about noise music, Jones (2016) asserts that "putting into words the chaotic series of emotions that wash over me would be betray the experience of watching a [noise] set somehow" (Jones, 2016, p. 239). In other words, any writing about noise music ultimately fails for Jones. While a historically informed definition might construct noise music as a caustic offshoot of experimental music that emerged in the late 1970s and early 1980s and drew influence from the industrial and punk genres (see Bailey, 2009), this definition fails to address the wide and conflicting array of aesthetic approaches (Atton, 2011) and affective experiences (Jones, 2016) generated through the genre. While a long enough piece of

writing can cover many of these aesthetic approaches, engaging the affective side of noise

music proves far more challenging because "noise defies the kind of objectification that is

implicit when discussing art" (Jones, 2016, p. 238). But if noise is not an object, then what

is it? According to Thompson (2017), "noise is what noise does" (p. 51). Maybe the trick,

then, is to write about what noise music does and not what noise music is.

Building on this assertion, I use this article to investigate what noise does within the

context of education. Through an assemblage of texts, I suggest that noise, and in particular

the noise music genre, creates space for posthuman forms of collaborative and embodied

learning. In doing so, noise music contributes to the posthuman project of reframing

education by proposing a means for understanding education outside of its traditional

humanist aims. Through this lens, posthumanism challenges scholars to decenter the human

(as a cultural and historical production) and explore educational practices and contexts that

do not explicitly aim for the production of a specific kind of human as their ultimate goal

(Snaza & Weaver, 2015). By theorizing and culturally producing the human as the sole

benefactor of teaching and learning, education as a cultural (and humanist) apparatus hides

or distorts the matrix of actors and forces that contribute to (and emerge from) the process of

meaning making or knowledge construction (Fenwick & Edwards, 2010). Posthumanism

challenges this obfuscation.

Beyond a purely theoretical pursuit, exploring the posthuman within education holds

political value since dehumanization can only occur within a humanist context (Snaza et al.,

2014). The process of dehumanization relies on the binary logic of humanism: some entities

count as human (and thus receive privileged status) while others do not. The definition of

the human has changed over time, creating a means through which the abjection of certain

designations of people (racial, gendered, etc.) can occur because those in power defined

these groups as subhuman or not human (see Butler, 2010). This allows for systemic forms

of violence, creating a means through which the destruction of not only people and cultures but all animals and ecologies can occur. Humanist understandings of education recreate this violence by producing a hierarchy of knowledges and ways of knowing, one in which certain individuals exist as the beneficiaries of educational pursuits above others. Posthumanism provides one critical tool in reframing education away from this problematic end. And, as I will argue in this article, noise music provides one potential iteration of this valuable tool.

To further explore noise music as a posthuman education context, I place extant literature on posthumanism, noise, collaboration, and embodied learning in conversation with empirical research into and observations of the 2017 Experimental Education Series (EES), a quarterly workshop and concert series that focuses on noise music. In doing so, I expand theoretical arguments about distributed and embodied musical performance through interviews with four of the artists from the series and my own experiences watching their performances in person (along with repeated viewings of video recordings when available)[1]. This approach allows me to implicitly draw upon my own experience as an active member of the noise scene who organized this series and routinely performs as well. In constructing this argument, I first propose a definition of posthumanism that draws on posthuman educational research. I then reframe collaboration within posthumanism, decentering the human as the sole actor within collaborative learning practices and distributing the act of collaboration across multiple human and non-human actors. Next, I return to the literature on noise as a means to reframe noise music as a posthuman educational context, using the examples from the EES to explore posthuman collaboration and learning. Finally, I briefly touch on the concept of embodied learning as a means to reinforce the connection between noise, noise music, and posthuman collaboration and education.

Towards a posthuman understanding of collaboration

As a means to start conceptualizing posthumanism or, as Hayles (1999) would argue, one posthumanism amongst many, Pettman (2011) proposes the "cybernetic triangle" formed between human, animal, and machine as an orienting (but ultimately problematic) structure. The author contends that posthumanist research critically investigates the relationships formed between these three categories, both in their present cultural state and as historical forces that have shaped and reimagined themselves across time. Theories of posthumanism therefore position actors within a matrix of material bodies and forces, focusing on the relationships between these actors as opposed to nominating a single individual subject of research. By critically investigating these relationships, however, the cybernetic triangle begins to dissolve as the boundaries between human, animal, and machine collapse (see Haraway, 1991; Wolfe, 2012). Instead, posthumanism invokes an understanding of the social and material world that begins to theorize a flattened ontology that considers all actors equally (Bogost, 2012). From a methodological standpoint, posthumanist research starts with decentering the human as the default subject. While Petitfils (2014) advocates for an eventual recentering of the human subject, this does not imply a return to humanist forms of inquiry. Instead, "the recentered human subject is an active agent rather than a passive one" (Petitfils, 2014, p. 82) that only contributes in part to the construction of meaning rather than existing as the privileged and isolated beneficiary of social, historical, and ecological contexts.

Focusing on technologically oriented posthumanisms, this line of inquiry starts with the cyborg. Through this notion, Haraway (1991) challenges definitions of the human as bounded individual by arguing that technology extends into the realm of the human (via prosthetics, for example) and vice versa. Thinking historically, Pettman (2011) contends that notions of the human have always relied on technology, with humans defining themselves

through their relationship to the technological. Further still, the definition of technology as a discrete set of analogue or digital objects falls apart when considering cultural technologies such as war or school (see Snaza et al., 2014). Here, technology aligns with Agamben's (2009) definition of the apparatus, or "anything that has, in some way, the capacity to capture, orient, determine, intercept, model, control, or secure the gestures, behaviors, opinions, or discourses of living beings" (p. 14). Agamben's apparatus extends technology beyond physical creations to include non-tangible human constructions that mediate and control ways of being, doing, and interacting. Bogost (2012) then expands on critiques of anthropocentric framings of technology by not only questioning the distinction between the technological and the human but also recognizing and advocating for the independent agency of technologies. In doing so, posthumanism allows for the fullness and complexity of interpersonal relationships within cultural contexts (including learning ecologies) to emerge, producing a fuller, more detailed, and more critical understanding of the social world.

By engaging this understanding of posthumanism, I invoke actor network theory (ANT) as a means to explore posthuman contexts. By reframing the study of society (broadly defined) as the study of social relations between all social actors (human or otherwise), Latour (2007) uses ANT as a means towards questioning humanist understandings of the social world. Taking this consideration to heart, ANT research challenges scholars to uncover and recognize the matrix of human and non-human actors that produce social environments and affectively relate to each other (Latour, 2007). Understanding the human individual, for example, often involves uncovering the vast collection of agentic actors (human, animal, technological, etc.) that collectively produce and shape the identity of that individual (see Walsh & Tucker, 2009). ANT also reframes the production of technologies as a multifaceted process through which a matrix of actors

and forces collectively produce these cultural objects, as shown by Haenisch's (2013) temporal reconstruction of Andrea Neumann's inner piano.

Drawing ANT into an educational context, Fenwick & Edwards (2010) consider how networks of individuals, technologies, and institutions collectively identify, produce, and circulate knowledge. The act of knowing, in this sense, becomes an embodied, contextual, and situated practice. Subsequently, learning emerges as "an effect of the networks of humans and non-humans that identify certain practices as learning, which also entails a value judgement about learning something worthwhile" (Fenwick & Edwards, 2010, p. 41). Rather than knowledge and learning existing as material or universal entities, matrices of human and non-human social actors produce, embody, and enact knowledges and practices of learning. Through ANT, education research shifts towards a process of uncovering the matrix of actors that produce ways of knowing and learning to better understand these social technologies. ANT research therefore reinforces the importance of exploring posthumanism within education, as the production of knowledge inherently defines certain ways of knowing as more valuable or meaningful, a process that can easily extend into the act of dehumanization afforded by humanism (Lindgren & Öhman, 2019; Snaza et al., 2014).

While the process of developing a posthuman education remains complicated, multifaceted, and laborious, scholars have begun to propose approaches towards this decentering process. For example, Rousell and Fell (2018) distinguish between the individual and humanist act of "becoming an artist" and the collective act of "becoming a work of art" as a guiding principle within posthuman arts education. Under this conception, "a work of art is no longer considered the material and intellectual product of an individual human subject, but rather, a dynamic assemblage of multiple agencies and processes that disrupt and interfere with one another" (Rousell & Fell, 2018, p. 93). This notion extends beyond the arts and positions education as a collective and materialist project in which

multiple actors work together in the creation of meaning[2]. This shifts the focus of education away from the construction of an individual to the constructive interaction of agentic bodies. Weaver's (2010) interdisciplinary science curriculum, one that considers the contributions of multiple actors and bodies towards the construction of the social world, relies on a similar framework. One way of theorizing a posthumanist education, therefore, involves the decentering of the human as the subject of education in favor of an interconnected matrix of actors.

Building from this foundation, conceptualizing collaboration within posthumanism becomes rather simple. Returning to Rousell & Fell (2018), collaborating within the act of becoming a work of art involves not only humans collaborating with other humans but collaborations between all objects (i.e. technologies, animals, ecologies, social bodies, ideas, people, etc.) in the coconstruction of meaning. Pickering (1995) provides a model for this kind of collaboration when discussing "the dance of agency" in scientific labs. According to Pickering, scientists shift between states of activity and passivity when conducting experiments: the active process of setting up lab equipment to collect specific forms of data precedes the passive process of waiting for the experiment to unfold. In a reflection of this process, the biological, chemical, or physical bodies being studied sit passively by while scientists organize laboratory apparatuses and then enact their own agency outside of the scientist's goals or desires during experiments. This dance goes back and forth as iterations of the experiment continue, with scientists and examined bodies collaboratively constructing knowledge throughout.

But just as multiple types of posthumanism exist, so do multiple forms of collaboration. For most, collaboration usually takes on two different forms: "collaboration as helping" and "collaboration as working together" (Halverson et al., 2018). The former refers to one person helping another achieve a specific outcome while the latter involves

people working together to achieve an outcome they could not reach as individuals. To understand both of these within the lens of posthumanism merely involves trading out people for non-human actors. The dance of agency in science, for example, presents a form of collaboration as working together between the human and ecological objects. However, both types of collaboration produce a certain rigidity of identity that cannot account for the dissolution of borders between human, technology, and nature. To engage the highly complex web of interactions proposed through posthumanism and ANT, I propose the parallel use of "collaboration in the air," or the kind of collaboration in which actors indirectly collaborate by building on ideas that exist within the same space (Kafai & Harel, 1991). Under this form of collaboration, intentionality vanishes; as actors come into contact with and respond to the ideas and artifacts they produce, new creations and forms of meaning collaboratively emerge. Rather than ascribe authorship to one individual, collaboration in the air instead distributes that practice across a matrix of interconnected bodies. This conception relies on a holistic and ecological approach to collaboration, one that allows for posthumanism to exist as an orienting framework towards education and the broader social world.

The noise of posthumanism

Building on this definition, a crucial part of exploring notions of collaboration through the posthuman lens involves finding (or, more accurately, defining) contexts that align with this conceptualization of collaborative learning. While I contend that conceptions of posthuman collaboration can emerge within any environment, as illustrated by Pickering (1995), contexts where human participants actively embrace technology as a coconstructor in the creation of meaning provide valuable sites of research into posthuman collaboration and education. Cultural spaces that define themselves through technological posthumanisms provide a window into how actors within posthumanist environments might relate, interact,

and collaborate in the process of making meaning without relying on humanist conceptions of learning that obscure the complex matrix of actors that hierarchically produce knowledge and ways of knowing. Although these sites of research do not always perfectly embody posthuman worldviews, since definitions of posthumanism often rely on and unintentionally reproduce humanist ideologies (Snaza et al., 2014), they still provide an enactment of posthumanism to explore and critique

To this end, I propose the use of noise music as a site of research into posthumanist forms of collaboration and, subsequently, education. I do so in part because noise musicians already conceptualize the act of teaching within the noise music genre as a distributed and posthuman practice, one that redefines the role of the teacher to include not only other musicians but technologies in the form of musical instruments and traditions (Woods, 2019). The theoretical and musicological foundations of the noise music genre also rely on notions of technological posthumanism and the cyborg (see Thompson, 2011). Ryan Dunn of the noise project Instinct Control illustrates this point by performing with an electronic instrumentation system that troubles the border between human and machine (Herting, 2017a). By placing his hands on the exposed circuit boards of tape recorders, Dunn allows electricity to flow through his body and become a part of the electrical circuit that creates sound. Rather than strictly being a performer, Dunn becomes part of the instrument and allows the agency of the tape recorder to speak (since he does not have control over where electricity flows). In turn, the tape recorder and Dunn collaboratively create the performance. This example speaks to the relinquishing of human authorship and embrace of technological agency that exists throughout noise music (Novak, 2013) and invites a posthuman understanding of the genre to emerge.

To conceptualize a posthuman noise beyond noise music, it helps to first think about sound. For Ceccheto (2013), the medial nature of sound provides and avenue to think

through the varied and, at times, self-contradicting formations of technological

posthumanism within contemporary discourse. Sound, as both a differential and relational

phenomenon, creates a medium to approach varying strands of technological posthumanism

simultaneously and consider a vast array of relations between and within the human and the

technological (Ceccheto, 2013). In this article, I focus on noise as one type of sound which

enacts a specific (yet polysemic) set of relations. However, most theorists position noise as a

humanist technology. Russo & Warner (2004), for example, assert that "noise is not, as

information theorists would have it, a signal that we do not want to hear. It is a signal that

someone does not want to hear" (p. 53). Under this conception of noise, sound gains its

noisiness because of its construction as such by a person. This definition of noise therefore

sits in opposition to Ceccheto's (2013) framing of sound as a medium within which

technological posthumanisms emerge by ignoring the role technology plays in the

construction of noise. An alternate definition of noise is therefore needed.

In opposition to this anthropocentric understanding, Serres (2007) conceptualizes

noise through an affective lens by reimagining how noise reorients the relationship between

all types of (anthropocentric and non-anthropocentric) bodies. To reach this definition,

Serres (2007) first explores the notion of the parasite: a relational entity that exists between

subject and object (or affecting and affected body). The parasite acts on affective

relationships, forcing both subject and object to reorient their relationship to either include

or explicitly ignore the parasite (both of which result in a changed relation). Serres (2007)

extends this formation by situating the parasite within his notion of the milieu, or the

mediating context of an affective relationship. More than just providing a means for this

relationship to exist, the milieu acts on and affects that relationship, taking on the

characteristics of the parasite itself. Similarly, a "parasitic noise," one in which the parasite

disrupts and reorients an extant relationship (Serres, 2007), inherently draws attention to the

milieu. In stopping the course of events within an affective relationship, the parasitic noise makes the milieu apparent for those within this medium. By providing an affective and relational definition of noise-via-the parasite, one in which the relationship between an affecting and an affected body transforms through the introduction of noise, Serres connects to and expands on Ceccheto's (2013) understanding of sound as a site of mediation within technological posthumanism. Noise therefore provides a rich context for exploring affective posthuman relationships between man, machine, and the new identities that form within the intersection between them.

Building on this broad definition of noise, Thompson (2017) then conceptualizes noise within a musical context by recognizing the ever-present nature of noise within music. Noise exists as a sonic parasite and as the milieu of music itself, simultaneously acting on and enabling the formation of relations within techno-musical systems. Thompson (2017) proposes the act of breathing while singing as an example of this parasitic relationship. Within the western classical music tradition, vocalists hide the act of breathing by utilizing techniques that silence their inhalations. However, the physical act of singing cannot occur without first inhaling. Inhalation has therefore always existed as part of the musical milieu. If audible, it produces a parasitic noise by drawing attention to that musical milieu and reorienting the relationship between performer and audience, or perhaps even between the listener and the apparatus of musical tradition. Returning to noise as a musical form, noise as both a genre in itself and as a gesture within a broad range of musical traditions exists as a form of exposure, one that reveals the musical milieu and reorients the relationships between affecting and affected bodies that interact within that milieu. In Thompson's (2017) words, "rather than bringing noise into music, noise music is thought of as amplifying, extending and foregrounding the noise that is always already within the techno-musical system" (p. 129).

The ways that artists approach this gesture, however, vary widely. The vocalization technique used by Junko (Mojuvideo, 2015), for example, creates noise by drawing attention to the material reality of the human voice (much like the example in the last paragraph). By constructing a performance entirely out of visceral screams that push the physical limits of the voice, Junko challenges disembodied or purely sonic understandings of music by emphatically revealing the human body as sounding object within a techno-musical milieu that routinely masks the body's agency. The performance, if effective, then reorients the relationship between the listener and the cultural apparatus of music. Sam McKinlay's overwhelming use of dynamic produces a similar set of gestures within an aesthetically contrasting style. Performing under the project name The Rita, McKinlay builds entire compositions out of unending and barely changing layers of static that he produces by overdriving and distorting various audio recordings, including recordings of snorkels and skateboarders performing tricks on grind rails (McKinlay, 2019). In doing so, McKinlay creates musical compositions by exposing the technologies that produce the sounds listeners hear: the sound of The Rita is the overdriven sound of musical equipment agentically responding to overpowering electrical signals. The noise of both Junko and McKinlay therefore act on the relationship between the listener and the body of the techno-musical system, interrupting and reorienting the expected interactions between these bodies by revealing invisible or taken for granted aspects of the musical milieu.

Within this definition of noise as an affective and parasitic relationship, an understanding of noise-via-posthumanism begins to emerge. Starting with considerations of music technologies in the form of instrumentation, Novak (2013) makes this connection clear when discussing the ways in which noise musicians redefine authorship to include musical instruments or electronic instrumentation systems: noise musicians "deliberately attempt to keep themselves from naturalizing... instrumental self-expression. To perform

their own loss of control as authoritative human subjects, they cannot fully learn the system" (p. 159). In turn, this leads to a new set of relations within the practice of making music, one in which noise musicians do not conceive of their music as "'my sound,' or even 'this sound I make,' but 'a noise that surrounds me and becomes my world'" (Novak, 2013, p. 159-160). Through this conceptualization of music, noise musicians decenter themselves within the context of performance, drawing attention to their existence as one part of an interconnected, technological system. While the live circuit bending of Instinct Control provides one example, the feedback and synthesizer systems of Victoria Shen (Dion, 2019) and the feedback-only onslaught of Masonna (Hataschio, 2012) push the notion of instrument systems beyond a closed loop between performer and music gear and begin to include the entire venue space (including audience members). This occurs because the mechanism of feedback relies on physical space: as a microphone moves closer and farther away from a speaker (or as material bodies move between microphone and speaker), the sound produced through this feedback system changes. While Shen and Maso Yamazaki of Masonna partially control this feedback by moving around the venue, they cannot control every material element that creates that sound. In turn, feedback engages and reveals the agency of the venue and the bodies it contains.

Thinking more broadly about technology as a social apparatus, conceptions of noise have also disrupted relationships with these technological bodies as well. For Attali (1985), noise exists in antithesis to the institutional power behind recorded forms of popular music and reorients the relationships created with and through this apparatus: "any noise, when two people decide to invest their imaginary and their desire in it, becomes a potential relationship" (p. 159) outside of this technology. Under the stage name Emil Beaulieu, Ron Lessard engages this form of noise by releasing purposefully "unplayable" vinyl records. The *America's Greatest Noise* double LP (Lessard, 2005), for instance, is comprised of 42

locked grooves and an assortment of random scratches and etchings carved directly onto the records. This gesture challenges audiences to engage their relationship with physical media and, subsequently, the institutions that produce these objects. Moreover, Hegarty (2007) extends this noisy disruption beyond the apparatus of capitalism by reframing noise as a parasite within musical traditions. Noise, in this conception, challenges the existing norms of performance, instrumentation, composition, and various other musical substructures which, in turn, forces audiences and musical traditions to reorient their relationship in light of this noise. Both Junko and The Rita provide examples of this approach, challenging traditional conceptions of composition and performance through their abrasively static works. In all of these conceptualizations, noise exists outside of anthropocentric definitions of the term and emerges through the posthuman relationships formed between and within humans, technologies, and apparatuses. Noise music, by extension, exists as a posthuman genre.

Noise music as educational context

Although noise exists as a parasitic component within all musical traditions, the genre of noise music intentionally constructs itself within and through this form of affect. This positions noise music as a particularly valuable cultural space to explore noise as both a component of music and affective relations more broadly. For the purposes of this article, I will consider how noise music exists as an educational context. To position this argument, I rely on Thomson's (2007) interconnected notions of "scene as classroom" and "performance as classroom" to reframe the practice of music making as an educational endeavor. Each frame poses its own set of questions, with one asking what is learned in the moment of performance and the other asking what is learned across a temporally distributed set of actors and contexts. Yet, as I argue in this section, both create space for posthuman collaborations to occur.

To further develop this argument, I use this section to connect extant literature to empirical findings from research into the 2017 Experimental Education Series (EES). As the organizer of the series (and a subsequent audience member), I found that the teaching artists from this collection of workshops and performances (vocalist Amanda Schoofs, electronic musician Angel Marcloid, percussionist Sarah Hennies, and the conceptual sound art duo Large Item Pickup) all framed their creative practice through a posthuman lens. I developed this understanding of their artistic processes by observing their performances during the series and conducting interviews with each artist. I turn to this data set as a means to illustrate how some noise artists navigate and conceptualize posthuman relationships between the performer and music technology (both as instrument and apparatus) within the act of performing and the cultural context of the noise music scene. In doing so, I do not intend to return to humanist forms of educational research but rather recenter the human (Petitfils, 2014) as a means for engaging a broad matrix of collaborative musical actors through their work.

Performance as classroom

Starting with performance as classroom, the use of both free improvisation and indeterminacy proves crucial in understanding the collaborative potential of noise music. Starting with free improvisation, or the co-creative and spontaneous act of making unrehearsed music, Fischlin et al. (2013) argue that this performance practice creates space for new knowledges to form as musicians spontaneously develop new languages, to use Attali's (1985) term, in the performative act. Moreover, "the use of… unfamiliar performance techniques on familiar musical instruments to expand the sonic vocabularies conventionally associated with those instruments, may be indicative of [free] improvisation's insistence on finding new kinds of solutions to familiar problems and challenges" (Fischlin et al., 2013, p. 38-39). While a large percentage of noise musicians

rely on free improvisation, some compose and rehearse their works before performing. Still, a sense of spontaneous creation remains through the use of indeterminacy, or the purposeful release of control by the conductor to the environment (Nyman, 1974). In doing so, the composer or performer creates space for collaboration between actors to occur in the moment of performance. Indeterminacy lessens the restrictions of the western musical apparatus and intentionally engages the dance of agency between the composer, musicians, instruments, environments, and other actors.

Despite this tendency towards a posthuman collaborative musical practice, dominant ideologies within the western musical canon often encroach on this work. As Keep (2009) notes, free improvisers (especially within the free jazz tradition) often rely on humanist definitions of musical skill that reinscribe the assumption that musicians can and should exact a fully encompassing control over their instruments. While free improvisation reframes skill outside of a specific set of western musical techniques, this conception of skill still undermines the agentic nature of instruments by promoting the theory that musicians act on instruments (and not vice versa) to produce sounds of their choosing. Although skill in itself is not problematic, equating musical skill with cultural value reproduces a humanist understanding of music that once again leads to a hierarchy of certain ways of being and knowing while obscuring the matrix of forces behind cultural production. Within noise, a similar point of tension exists between Novak's (2013) assertion that musicians relinquish control to electronic instrumentation systems and the discursive practice of defining "good" noise musicians as those who exhibit control over their gear (see Atton, 2011). Similarly, practitioners of indeterminacy have undermined their own practice from the start: John Cage, the experimental composer who first adopted the term indeterminacy, routinely asserted correct and incorrect ways of performing his works which in turn consolidated agency within the composer (Lindau, 2014). Even computer music, with its inclination

towards randomness, favors human agency over the agency of technologies through the use of algorithms and the conceptualization of electronic instrumentation acting as a score (Kuivila, 2009). All told, the use of free improvisation and indeterminacy may create a means for conceptualizing and intentionally enacting posthuman collaboration, but that outcome remains far from certain.

While noise music and the musicians making it could easily succumb to these critiques, I contend that most practitioners within the genre fully embrace the noises that emerge from the techno-musical milieu. When Amanda Schoofs discusses her development as a vocalist, for example, she does not position herself as the sole contributor to that development but instead situates herself alongside her voice as an instrument:

> I think that some of the most exciting vocalizations that I've ever discovered have been complete accidents that have happened when I've been trying to do one thing and something else happened… and then maybe I try to do that again and I fail. And I get a different type of sound. And then I try to do it again and I get a little bit closer, but it's that exploration process in which you come up with these unique things that become personal.

Rather than finding a way to exert total control over her voice, Schoofs instead creates a dialogue between the human voice, a musical technology in its own right (see Cassidy, 2013), and the performer that allows space for the agency of her instrument to emerge and collaboration between technology and human to occur. Her performance at the EES (see Linski, 2017a) extends that collaboration to include another technology: the PA system. Specifically, her microphone technique speaks to the dance of agency between artist and technology. At times, the PA system clearly amplifies her voice in a way that sounds unaffected as moments of controlled vocal prowess (developed through years of classical training and practice) sit alongside uncontrolled, alien sounding techniques as sonic textures crackle in and out of the aural landscape. At other times, Schoofs pushes the microphone up against her mouth, overdriving the diaphragm and creating an uncontrolled sound that forms

outside of her voice. A collaboration occurs: neither the PA system nor Schoofs could create that sound independent of each other, positioning this interaction as a posthuman form of "collaboration as working together" (Halverson et al., 2018). The performance therefore reveals the techno-musical milieu, exposing the PA system as a part of Schoofs instrumentation and allowing the PA and microphone to contribute to the performance.

Similar moments exist within Angel Marcloid's performance (and overall practice) as well (see Linski, 2017b). As her set begins, Marcloid shakes and lightly taps on the table that holds her gear, including an amplified slinky and a few springs. By manipulating her table, she allows the springs and slinky to react on their own and immediately takes on a state of passivity in the dance of agency between her and her gear. A similar moment occurs about one minute and twenty seconds into the performance when she drops a wind-up music box into a metal container. The box hits a spring (which continues to make sound beyond the initial impact) and then slowly unwinds. Marcloid's use of electronics, both in the form of circuit bent devices and mixer feedback, plays a similar role: while Marcloid retains some control over her electronics, they constantly produce unexpected results. She leans into this unpredictability when modifying effects pedals by leaving these devices "plugged into equipment and on and in a feedback loop while [I] work on [them]. I don't think that anybody else really does that or would think to do that because it's kind of the wrong way to do it in order to get really intentional results." Rather than approach this process as a way for an individual to act on an object, Marcloid instead allows her equipment to run (i.e. exercise its agency) while building it. This allows for the feedback system to adjust and respond as the gear and Marcloid interact, enacting a responsive and collaborative process of creation (and meaning making) which she mirrors in her performance.

Scene as Classroom

Turning now towards notions of scene as classroom, a similar connection to posthumanism

applies as the creation of meaning occurs through a distributed and collaborative practice of making music. Beyond the collaboration between performers and instrumentation, scene as classroom reveals a new set of collaborators including venues, other performances or recordings, musical ideologies, and other members of the music scene (venue organizers, concert promoters, label heads, etc.). As Thomson (2007) attests, the relationships contained within "a particular scene are mediated through the 'extra-musical,' organizational activities like curation and promotion of concerts, series, festivals, and recordings" (p. 8). These practices shape the forms of meaning that emerge from these scenes by promoting or restricting certain types of music making and ways of being within these contexts, thereby shaping the kinds of collaboration they engender. Collaboration within the scene as classroom therefore shifts away from Halverson et al.'s (2018) conception of "collaboration as working together" and towards Kafai and Harel's (1991) theory of "collaboration in the air." In these collaborative moments, actors within the scene may not directly work with each other but the artifacts, ideologies, and narratives they produce still contribute to the cultural production of the music scene.

Moving beyond Thomson's (2007) and Kafai and Harel's (1991) humanist approach to music scenes and collaboration, musical traditions (as a technological apparatuses) and spaces (both in terms of ecological or geographical spaces and venues) both exist as agentic collaborators and important parts of any music scene. Focusing on the context of noise music, Novak (2013) formulates music traditions as collaborators when defining the genre:

> The Noise I describe here did not emerge through its pure distinctions from music but in the overlapping and repetitive feedback between 'noise' and 'music,' 'local' and 'global,' 'old' and 'new' that generates new modes of musical and social experience. (p. 232)

Noise music therefore emerges through the interaction between one set of musical ideas and another, aided by a series of collaborators including performers, audiences, instruments, and

other actors. Regarding physical spaces, scholars have connected the histories of venues to the formation of a multitude of music traditions and scenes. For example, the invention of public concert halls drastically shaped western classical music in the 18th century (Raynor, 1972) and the availability of warehouses and abandoned factories contributed to the birth of avant-grade jazz in the 1960's and rave culture in the 1990's, respectively (Grazian, 2013). Beyond venues, the actual ecological landscape surrounding a geographically defined music scene can act as its own collaborator in producing meaning. Noise music produces a particularly important example within this theorization because, as Snaza (2016) contends in his analysis of the aesthetically related black metal genre, the parasitic noise within the genre can disrupt the socio-historical divide between human and nature (even if it only happens for a moment). This implicates the ecological in the collaborative act of identity formation (or, perhaps, destruction), a process in which noise affects, acts on, and reorients the relation between man and nature.

To exemplify this notion of collaboration within scene as classroom, Sarah Hennies performance of *Falsetto* (the piece she performed during the EES) at the 2017 End Tymes musical festival draws a number of collaborators together in creating the experience of the piece (see Herting, 2017b). First, the venue (as a physical and material space) contributes to her performance by creating its own form of noise: the kick drum slowly creeps across the floor as she performs and at one point her chair seems to fall into a crack in the stage. Hennies, as the performer, has to address these issues which alter her performance both in the sense of the sound and the visual aesthetics she creates. Although neither of these actions exist in the score, they fit the general thematic of Hennies slowly becoming overwhelmed by the musical instruments she tries to manipulate (which, in turn, points to the agentic contribution of her instrumentation as well). At the level of the noise scene, Hennies positions her performance in opposition to the dominating aesthetics of noise music

that focus on the overtly loud and sonically overwhelming (Bailey, 2009; Hegarty, 2007): "when you go to End Tymes and play that piece that I played in Milwaukee, surrounded by ten different sets of harsh noise… all of a sudden the festival is different than you thought it was." Under this conception, Hennies indicates that the contextualization of her work in contrast to the harsh noise musical tradition acts as a form of collaboration to create the meaning behind piece. Additionally, by working against the aesthetic markers of harsh noise, she aids in collaboratively developing the identity of the festival as well.

Thinking through space on a broader scale, the duo Large Item Pickup (comprised of Bianca Naves and Erik R. Montgomery) engage the surrounding geographical and ecological space as a collaborator in their work, mirroring the ANT-informed conceptualization of Andrea Neumann's inside piano (Haenisch, 2013). In Toledo, OH (the hometown for both performers), city residents drag their trash cans out to the curb once a week along with larger items that do not fit into those cans. City sanitation workers then start the waste removal process by collecting garbage from the trash cans and writing down where residents have left larger items. Workers then return to the spots with large items the next morning to collect these oversized objects. This process creates a reoccurring window of time in Toledo where large pieces of trash sit unmonitored on public streets. Taking advantage of this window, Naves and Montgomery start the composition process by travelling around Toledo and collecting these unmonitored objects (hence the band name Large Item Pickup). They then fashion these items into instruments, props, costumes, and other elements of the new performance piece. For their performance at the EES[3], an industrial roll of sequined fabric and sweatshirt material provided the basis for new costumes while large wood scraps, a pile of mylar, and a few hundred balloons served as instrumentation. This positions Large Item Pickup as a collaborative project through which Naves and Montgomery engage a form of collaboration in the air that stretches across the

city as a sociohistorical entity. A matrix of actors including Toledo's sanitation policies and the residents of the city contribute alongside Naves and Montgomery in the process of "becoming a work of art" (Rousell & Fell, 2018) through Large Item Pickup.

Broadening even further, Naves theorizes her practice as one that intersects with nature and ecological bodies as well. Specifically, Naves conceptualizes part of her work through a vocal gesture named "The Call." As she explains, The Call happens

> when I'm around other people and I can feel their energy, it's just this very visceral sound that kind of changes… A lot of times its around water or in forests. It's just some kind of call that I'm trying to give out to the earth to connect with people that I feel close with… I could not tell you how many times people asked me, "What is this call? What is this about?" And it's like, "I don't know."

In this description, Naves positions The Call as a type of relation, a visceral means to connect Naves, people, and the earth beyond a formalized language. The fact that Naves cannot describe The Call, only what the call does, mirrors Thompson's (2017) contention that "noise is what noise does" (p. 51). This allows The Call as both an intra- and extra-musical practice to exist as a relational entity. It forms the connection between Naves, other people, and ecology in a way that approaches Snaza's (2016) conception of noise as a means towards collapsing the ecological and the human. The Call also exists as a collaborative practice in that other people and the presence of water and forests act as inspiration. The Call and its subsequent meaning as a musical gesture, therefore, does not come only from Naves but from a multitude of affecting and affected bodies.

Posthuman embodiment in noise

To end this article, I want to engage one final conceptual turn towards embodied cognition. I do so because of the potential challenge it poses to posthuman educational research: if cognition exists as an embodied phenomenon within the corporeal body (see Lakoff & Johnson, 1980; Varela et al., 1992), then the act of learning exists as a humanist

phenomenon. However, the humanist framing of embodiment collapses as soon as the notion of the body expands beyond an anthropocentric conception of the term. Clark (2008) affirms this understanding of embodiment when he states that the human mind "emerges at the productive interface of brain, body, and social and material world" (p. 219). Embodied learning, therefore, extends the process of learning beyond the individual and into the artifacts and individuals they interact with in this process (Okita, 2015). This conception of learning relies heavily on Hutchins' (1995) understanding of distributed cognition, one in which the individual agent no longer serves as the singular unit of analysis but instead stretches across a matrix of interconnected human and non-human actors. Embodied learning provides no exception. Distributed cognition also aligns with Fenwick & Edwards (2010) assertion that learning and knowledge exist as products of and actors in a broader posthuman matrix. Within this frame, embodied learning exists as a posthuman project.

In considering this definition, the act of collaboration within noise music (considered through both the lens of performance as classroom and scene as classroom) exists as an embodied learning process. In performance, noise artists do not enact a full sense of control over this music but instead engage a dance of agency that includes themselves, their instruments, cocreators (in the form of fellow performers and the audience), and the surrounding scene. Amanda Schoofs' performance places embodied knowledge (in the classic sense of the term) of western vocal traditions in conversation with her own voice as a not-fully-controllable music technology and the PA as its own sounding device. The highly contextualized meaning constructed through Sara Hennies' set emerges within the matrix of relationships between her, her percussion instruments, the venue as a material space, and the musical tradition of harsh noise festivals. Angel Marcloid does not act on but collaborates with agentic electronics and metal springs while the entire city of Toledo engages in the learning processes produced in conjunction with Large Item Pickup. The act of making

noise music engages a process of embodied learning by intentionally enacting posthuman forms of collaborative learning through free improvisation and indeterminate performance practices. However, by contextualizing this learning within a web of posthuman relationships, the meaning formed within and through these performances and scenes remains intrinsically connected to spaces, technologies, apparatuses, audiences, and performers that engage this collaboration. Outside of a noise festival, for example, the meaning created through Hennies performance might drastically change. By embracing and foregrounding these relationships, noise music presents a highly potent context for exploring meaning making and, subsequently, learning within the project of posthumanism.

In their brief overview of posthumanism as a project within educational research, Snaza and Weaver (2015) connect the project of developing a posthuman education to trying "to figure out how to ask what education means without presupposing that the answer will always, at least implicitly, take the form of: 'Education will make the kind of human who can…'" (p. 2). In this article, I argue that noise music, as an educational space, engenders the kind of collaborative and embodied learning that goes beyond creating a specific kind of human by engaging a broad spectrum of nonhuman and agentic actors in the process of developing new forms of meaning through music. To use Rousell and Fell's (2018) terminology, noise musicians do not become artists. They become works of art, contributing to a larger project of creation alongside multiple human and non-human collaborators. In doing so, I position noise as a cultural technology within this process. If the parasitic noise (musical or otherwise) draws attention to the surrounding milieu and reorients social order it interrupts (Serres, 2007), then noise can aid in intentionally crafting contexts that engage distributed forms of posthuman collaboration (or, at least, recognizing where and how this collaboration occurs). The reoriented system that emerges through a noisy interruption, one that engages the surrounding milieu as a co-constructor of meaning,

contextualizes and enacts the posthuman educational project. Put simply, noise provides a tool for reframing education towards posthuman ends. It then falls on scholars (and musicians) to use, collaborate, and dance the dance of agency with that tool.

Declaration of Interest Statement

No potential conflict of interest was reported by the authors.

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[1] Two of the performances, one by Amanda Schoofs and the other by Angel Marcloid, exist online

    (see Linski, 2017a; 2017b). While the performance by Sarah Hennies from this series was not

    videotaped, a different performance of the same piece does exist (see Herting, 2017).

[2] Throughout this article, I intentionally separate the terms meaning and knowledge to avoid the

    humanist implications of the latter (see Snaza et al., 2014). However, in citing other sources that

    use the term knowledge within posthumanism, I do use the term occasionally throughout.

[3] Unfortunately, video of this performance does not exist.