

# Listening Like a Postdigital Human: The Politics and Knowledge of Noise



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## 1 Introduction

The postdigital designation continues to be a site of popular and scholarly contestation, which reflects its immanent and historical unruliness. The latter concerns the term's lineage and deployment over time, while the former concerns the reality it names. Like all history, the history of digital technologies is not linear or predictable, but contingent and messy. Florian Cramer (2015) presents a useful exegesis of the term 'postdigital', exploring its literal, colloquial, esthetic, technological, and temporal deployments and meanings. The digital is, literally, anything that is counted, even if such counting entails a modification (reduction, abstraction) of the thing. 'Digital' comes from the 'digits' of the hand. Thus, an 1877 presentation at the American Dental Association referenced 'digital education' in relation 'to differences, within dentistry, in dexterity of the left and right hands' (Fawns 2019: 133). Analogue refers to that which is not—or perhaps cannot—be divided into discernible units, and 'instead consists of one or more signals which vary on a continuous scale, such as a sound wave, a light wave, a magnetic field' (Cramer 2015: 18). There is 'only digital or digitized information: chopped-up numbers, letters, symbols, and any other abstracted units, as opposed to continuous, wave-like signals such as physical sounds and visible light' (23).

The computer, then, is both digital and analogue: 'The electricity in a computer chip is analogue, as its voltage can have arbitrary, undifferentiated values within a specific range' (22). The computer *digitizes* information and data by transforming inputs into discrete units (ones and zeros), a process enabled by both digital and analogue agents. As Petar Jandrić puts it, 'human beings have always been digital' (2019: 172). We have always, that is, accorded data into discrete categories. Even

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the binary code long predates the twentieth century technologies we associate with the digital era, as the arrangement of events, ideas, and senses into systems of two ‘has been used in various forms of communication such as smoke signals and drums’ (162). We have also, of course, always been analogue, as our bodies and being in the world exceeds and escapes those categories.

Discussions of the postdigital human generally revolve around the nexus between the human and machine, both of which—in addition to the nexus itself—are open to debate. In fact, one of the most productive possibilities of the concept of the postdigital human is precisely that it opens up the human, the machine, and the relations between them to struggle and dispute, which in effect subjects everything they are defined *against*, in addition to the unique properties ascribed to each, to investigation and problematization as well. One of the central categories here has to do with intelligence or knowledge, as can be seen in recent developments in and controversies over different forms of ‘artificial intelligence’, a term John McCarthy coined in 1955. Interestingly, artificial intelligence was seen as a project of, in McCarthy’s words, ‘making a machine behave in ways that would be called intelligent if a human were so behaving’ (1955: 11). The cursory definition is a mapping of ‘human’ intelligence into machinery while at the same time not defining human intelligence, thereby implicitly leaving that definition open. Postdigital technologies continue to forefront the struggle to define intelligence, evidenced by the “‘AI Effect,” whereby as soon as AI can do something, it is no longer considered to require intelligence’ (Dyer-Witheford et al. 2019: 9). Intelligence is maintained as an exclusive property of the human through a dynamic antagonism with technological capacities. By highlighting the blurred and sometimes indistinguishable lines between humans and technology, postdigital humans offer the possibility of opening up our conceptions of agency, politics, and community.

The industrial revolution is one of the central eras for understanding the contemporary debates over the human–machine nexus and division. In the first volume of *Capital*, Karl Marx defined the machine as ‘a mechanism that, after being set in motion, performs with its tools the same operations that were formerly done by the workman with similar tools’ (1967: 352). Machinery was the technological foundation upon which the capitalist mode of production properly came into form. Previously, capital had seized on previous technologies and forms of production, particularly handicraft production. Yet no matter how it transformed handicraft production, it could not come into its own because of the fact that such production rested upon the cognitive, physical, and other intelligences of the human worker. As capital is a mode of production in which labor is subordinated to and controlled by capital, the latter had to wrest such intelligence from the former. Machinery is the ongoing product of this transformation, as can be seen in the AI Effect, which acknowledges that AI technologies are the objectifications of intelligence into machinery.

In the *Grundrisse* manuscripts, written between 1857 and 1858 but not published until the early twentieth century (and not translated into English until the late twentieth century), Marx wrote about this intellectual transfer in a few pages collectively known as the ‘Fragment on Machines’. Here, Marx anticipates his theorization of

machinery in *Capital*, noting that as capital subjects labor processes to its logic, it produces ‘the *machine*, or rather, an *automatic system of machinery*... set in motion by an automaton, a moving power that moves itself; this automaton consisting of numerous mechanical and intellectual organs, so that the workers themselves are cast merely as its conscious linkages’ (1973: 692). The unfinished result is that ‘the accumulation of knowledge and of skill... is thus absorbed into capital, as opposed to labour, and hence appears as an attribute of capital’ (694). While the role of the ‘Fragment on Machines’ in Marx’s theory of value, the falling rate of profit, and so on, continues to generate significant debates, what is significant for this chapter is the interplay between the subjectivity of the worker and the machine. Marx’s conception of machinery ultimately rests on a hyphen between the machine and the human, which signals the dispersion of intelligence between and amongst them.

The key point here is that this ongoing and dynamic interplay continuously raises the question as to what constitutes knowledge and intelligence and the extent to which these should be defining attributes of the human. This is a question, for example, that the disability struggle continuously foregrounds because, as Ashley Taylor notes, intellectually disabled people are defined by the presumed absence of ‘sufficient reasoning or deliberative capacity to participate in research and decision making that could influence policy decisions’ (2018: 7). More generally, if the human is a privileged category accorded to particular subjects who possess certain capacities defined as intelligences (such as rational thought and autonomy), the struggles of all oppressed groups for recognition and self-determination run up against the problem of whether they should struggle to demonstrate their intelligence according to these definitions or challenge, expand, and/or dismantle them.

The concept of the postdigital human, then, can potentially contribute to these struggles in productive ways. This chapter does so by approaching intelligence and knowledge in the postdigital era through the sonic. Although sound has always been a central concern for education, the sonic dimensions of education have only become a more intentional concern of such research in the past few decades. While this work has opened up various important paths, there is a neglected examination of the relationship between sound, listening, intelligence, and knowledge. In fact, in education, sounds are seen as educational precisely because they transmit information from which we can express, interpret, attend to, and generate knowledge by applying our intelligence, thereby creating restrictive definitions of the human and knowledge and reasserting the privileged status of the human.

In this chapter, we mine the postdigital human’s potential for opening up agency, politics, and forms of life in liberatory directions by focusing on sound and listening. We do this by revisiting the history of music production and reception in the twentieth century, paying attention to the shifting definitions of noise on the one hand, and information, knowledge and sound on the other. We begin by situating the argument within some debates about postdigital aesthetics, which have tended to concentrate on the visual sense and cognitive properties of the human and the machine. We move next to tell a story of technological transformations in sound and noise, before turning to what listening like a postdigital human might entail and how

it can open up restrictive and exclusive definitions of agency, politics, and forms of being together.

## 2 Postdigital Aesthetics

In a 2012 panel at ‘South by Southwest’, James Bridle organized a panel titled ‘The New Aesthetic: Seeing like Digital Devices’ (2012) highlighted the slow but decisive ways that ‘our technologies and devices are learning to see, hear, to place themselves in the world’. As digital devices increasingly see the world, humans in turn increasingly see the world like digital devices. This raised a series of interesting debates about the postdigital world and its aesthetics, including the relationship between technology and human, or the hyphen in postdigital-humans, and the very question of the postdigital. This was not a new debate, as Michael Hardt and Antonio Negri, to name just one recent example, noted in *Empire* that ‘today we increasingly think like computers’ (2000: 291).

For David Golumbia, the ‘like’ in ‘seeing like digital devices’ is incorrect, because there is no simile implied by Bridle. In other words, for Bridle it is not about seeing *like* digital devices, but rather that our sight *is* digital. Golumbia maintains that ‘digital devices, and machines in general, do not *see* in the way people or even animals do’ (2015: 123). They might take in the same data, but seeing remains an act or sense that is inseparable from the body as a whole. At the same time, there are things that only digital devices *can* see. For example, algorithmic processing of data takes place in such a quantity and at such a velocity that it is imperceptible to the human. The only way the human can see this is, according to David M. Berry, through ‘the mediation of software’, which renders the human ‘twice (or more) removed from the inscriptions they wish to examine and read’ (2015: 125). Golumbia’s worry is that what is visible to the digital is beyond human sight, which is evident in his discussion of high frequency trading (HFT), where stocks are traded in quantities and at speeds beyond the human’s ability to grasp.

Even though humans create the algorithms on which HFT runs, the trades still ‘literally move faster than the electrical and chemical impulses of neurons can register’ (Golumbia 2015: 125). Machines see *other machines* in ways that humans—including those who might wish to regulate HFT—*cannot see*. We can only see the *traces* of their processes and sight, and, as noted above, to do this we need to rely on other machines. Moreover, the algorithms themselves are often rendered opaque to the public through proprietary protections (Paul and Levy 2015). As such, the sight of digital devices is autonomous from the human, and what is visible to the digital is invisible to the human. The most explicitly linear danger here is the automation of the justice system, in which the machine judges or, more precisely, *calculates*. Golumbia was not nostalgic about a pre-digital era per se, but leaves us with the question as to if ‘there are spheres wherein human beings must retain not just ultimate but thoroughgoing influence, *even if* the affordances of the technical system might seem to dramatically outpace those of the human one’ (2015: 133).

While postdigital writing about the new esthetic is about ‘seeing like digital devices’—whatever exactly that might mean and whatever particular technopolitical implications it has about the relationship between ‘the human’ and ‘the digital’—it is interesting to note that the esthetics of sound have not factored much into the postdigital human. This is particularly noteworthy given that the first mention of the postdigital, to my knowledge, appeared in an article about computer music. In ‘The Aesthetics of Failure’, Kim Cascone coins the term as a result of the fact that ‘the revolutionary period of the digital information age has surely passed’ (2000: 12), such that digital technologies no longer significantly disrupt life. At the same time, the implications of postdigital sound at the time had not been fully fleshed out relative to the new Internet-based music scene in which digital technologies are both tools for and means of distribution of computer music.

For Cascone, postdigital music comes from the *failures* of digital technologies, and in particular the ‘glitches, bugs, application errors, system crashes, clipping, aliasing, distortion, quantization noise, and even the noise floor of computer sound cards’ that comprise ‘the raw materials composers seek to incorporate into their music’ (2000: 13). He traces a lineage within twentieth century artists who turn the background of the industrial revolution into the foreground. In other words, the noise of capitalist production transitioned from the ground to the figure through the Italian Futurists and John Cage. For the Futurists, industrial noise was a source of energy and matter for sonic compositions. For Cage, on the other hand, it was the dichotomy of noise/sound and silence that had to be challenged. What this intimates is a need to examine the relationship between the mode of production and our sonic modes of engagement. Because machines and later digital technologies were so crucial in rearranging both of these independently and interdependently, and because machines and digital technologies are not autonomous from but deeply interconnected with the ‘human’, any investigation into posthuman and postdigital esthetics has to attend to the transformations as they impact listening practices and the audible surround.

One of the fundamental works investigating the history of these transformations remains R. Murray Schafer’s 1977 book, *The Soundscape: Our Sonic Environment and the Tuning of the World*, in which Schafer reviews the historical changes in the sonic environment and our listening practices, focusing in particular on the changes brought about by the industrial and electric revolutions. The book is also a deeply pedagogical one, although the pedagogical logics of the work remain rather implicit and, in many ways, explicitly linked to traditional conceptions of humanism. At the same time, he notes that soundscape studies are made increasingly possible by the expansive transformations in our conceptions and practice of music, including those brought about by digitization. In particular, Schafer attributes the very intelligibility of something like soundscape studies on five transformations: (1) the introduction of percussion instruments, which brought ‘nonpitched and arhythmic sounds’ into music; (2) aleatory processes where sounds are subjected to chance and contingency; (3) the diffusion of the borders between the orchestra and the urban environment; (4) the practices of ‘*musique concrete*’, which inserts any sound from the environment into a composition via tape; and (5) sound technologies and electronic

music that enabled a wider and diverse engagement with sounds (1994: 5). Taken together, these have facilitated our ability to engage the world as a sonic orchestra—one that now includes the sounds and voices of digital technologies. Although the book was written before the advent of the primary devices we associate with the postdigital today, it provides a helpful historical and theoretical orientation to develop dominant and potentially subversive posthuman practices of listening.

One of the most significant transformations germane to posthuman listening is the transition from the country to the town to the megalopolis. The latter comes into being with the industrial and electric revolutions and overturns the variations within and distinctions between the town–country dichotomy of the previous era, which definitively moved from a hi-fi to a lo-fi soundscape. A hi-fi soundscape ‘is one possessing a favorable signal-to-noise ratio’ (Schafer 1994: 43), which enables one to hear distinct sounds as a result of lower levels of diffused or ambient noise. In a lo-fi soundscape, there is such an overwhelming mass and density of sounds that the ability to discern discrete acoustic signals is made more difficult. There is simply more ambient noise, yet what is interesting is that this ambient noise is increasingly loud and, we would assume, intrusive. Revolutions in economic energy and lighting production have enabled manufacturing to take place nonstop as workers were forced to work according to the same unending dictates. Curiously, however, the noise of machines was largely accepted. Yet this resulted in an interesting development whereby the definitions of noise, sound, and music were expanded and diffused themselves, such that ‘by the early twentieth century the sounds of technology became more acceptable to the urban ear, “blending” with the natural rhythms of antiquity’ (72).

The electric revolution augmented and intensified this soundscape through two primary mechanisms. First, electric technologies enabled sound to be packaged and stored. Second, they allowed sounds to split from their original source. Schafer terms this later phenomenon ‘schizophonia’, a combination of *schizo*, a Greek prefix that means ‘split, separated’ and the Greek word, *phone*, meaning voice. The phonograph enabled both the packaging/storing and the distribution of sounds. Before the phonograph, sounds were tied to their originators, but the phonograph—and later the tape, compact disc, and digital computers—allowed their separation as well as their transformation around the world and their preservation for future listeners. The tape in particular made it possible to digitize sounds in the sense described by Cramer (2015). For while the tape was an analogue technology, it was able to be spliced and separated into discrete (digital) units.

With the electric and industrial revolutions, music merged with the environment. Two revolutionary sonic interventions were crucial, both of which are also cited by Cascone. First, the Italian Futurist, Luigi Russolo, created ‘an orchestra of noise-makers, consisting of buzzers, howlers and other gadgets, calculated to introduce modern man to the musical potential of the new world about him’. Russolo brought the background of the world into the foreground, positioning it not as ambient noise but as intentional signals. Cage did something similar but by different means. Rather than conducting with noise, his *4'33'* brought the assumed background of ‘silence’ into the foreground of the composition. The musical technology of the electric

revolution, in particular, intensified the range of sounds and frequencies in an effort to extend the tonal range available toward the inaudible in two directions: beyond audibility (too loud for human listening) and below audibility (too quiet for human listening).

### 3 Postdigital Listening and (Anti)Colonialism

If Schafer (1977/1994) attends to the shifting soundscapes of capitalism and the new modes of listening and audibility brought about by new modes of production, Michael Denning's study of anti-colonial phonographs during the electric revolution expands our understanding into considerations of nationality, imperialism, and race. Here, the technologies of the electric revolution worked to prefigure, inaugurate, and facilitate struggles against decolonialism. Denning (2015) focuses in particular on the phonograph revolution in vernacular music in the 1920s, mostly between 1925 and the Great Depression. What he calls a 'noise uprising' was located in and between, and facilitated by, the colonial ports. It thus took place in the Americas and Caribbean, Africa, Asia, the Pacific Islands, and elsewhere. While we tend to think of original phonograph records as artifacts from *previous* musical cultures, these were absolutely modern and contemporary. Moreover, they were fundamentally linked not only with Empire and imperialism but also with the emerging anti-imperialist and decolonial movements. He even suggests that they prefigured the political wave of decolonization in the twentieth century. The capitalist mode of production not only abstracted the sonic environment and created a lo-fi atmosphere but also worked to facilitate a counterrevolution of a hi-fi audible soundscape and attendant listening practices that upset the colonial harmonics of the era.

Capitalism, after all, was not just a European or Western development. From its very origins, it was an international and internationalizing system. Thus, in *Capital*, Marx constantly references the fundamental role that colonialism and slavery played not only in the prehistory of capitalism but also in its ongoing transformations. It was not merely that the original capital was acquired through brutal practices of colonialism and slavery, but that capitalism worked back on those systems as it expanded, which in turn propelled capitalism in Europe in new directions and intensified degrees of exploitation.

The vernacular musics 'emerged on the edges and borders of the empires of global capitalism, in the barrios, bidonvilles, barrack-yards, arrabells and favelas of an archipelago of colonial ports', which were 'linked by steamship routes, railway lines, and telegraph cables, moving commodities and people across and between empires' (Denning 2015: 38). In other words, it was not a unidirectional top-down process of creating a new soundscape, but a dialectical engagement that facilitated resistance through new audible configurations and listening practices. The ports were particularly important, as they brought together and merged different peoples and cultures, creating soundscapes that 'reverberated with sounds out of place,

discordant noises' (40). In response to the standardization and abstraction of the industrial factory, capitalism also facilitated 'the dissemination of vernacular musics', which 'together... created, not a "world music," but a radically new configuration of world musical space, a new musical world-system' (68). It was not uniform, and its challenge manifested precisely as a 'cacophonous counterpoint', as the 'barbarous accents and incomprehensible noises of these idioms... led to the moral panics of the era' (107).

The vernacular noise entailed two dominant phenomena: noisy timbres and syncopated rhythms. Regarding the first, the music, because it was often the result of errant encounters of different peoples, 'usually combined instruments with distinct and often clashing timbres' which used both Western and Indigenous instruments. Thus, rather than seeing the Western soundscape as imperialistic, we see an anti-colonial reappropriation of instruments and thus a reconfiguration of that soundscape. Denning notes, for example, that Western instruments 'became indigenous instruments', such that it no longer made sense to speak of the guitar as being a non-African musical device. Regarding the second, the music's use of syncopation, 'a more or less technical term for the displacement of accents to the weak or off beat' (188), caused a significant disruption and became not only an esthetic but also a political category.

Moreover, this sonic resistance also reversed the exportation of capital from the center to the periphery, as the phonograph records emanated in diverse pathways. Thus, even though the financial profits often emanated back to the imperial core, at the same time the capitalistic worldwide distribution helped to ignite the inspiring anti-colonial struggles of the mid-twentieth century. It was not the *content* of the message but the very form of it and how their 'very sound disrupted the hierarchical orders and patterns of deference that structured colonial and settler societies', which 'were heard as a violation of the musical order, an active challenge to the social "harmony"' (155) of the capitalist mode of production. The sounds of capitalism and imperialism are not only unconfined to the sounds of weapons and machines but even those sounds do not operate in a deterministic way. As Schafer reminds us, 'no sound has objective meaning' (1994: 137).

It is suggested that, at least in part, it was the anti-colonial noise uprising in tandem with the internal development of the capitalist mode of production that brought about the need for a reconfiguration of sounding technologies and their filtration through digital conceptions of information and communication transmission. As the distinction between noise and sound is not internal to the properties or relations internal to either, both are social conceptions that change in response to political, economic, and social struggles. Thus, the bourgeoisie condemned the noise of the proletarian crowds of the late nineteenth and early twentieth centuries while the progressive movements found inspiration and a new form of collective being by their participation within them.

As information and knowledge grew in importance for capitalism—and hence also for colonialism and imperialism—noise began to be defined as anything that would hinder production or that would limit or disable the effective transmission of inputs to outputs. In our increasingly 'infocentric' society, noise is pitted against

information. For Mack Hagood, infocentrism posits an ontology that naturalizes what it produces by figuring that ‘life is a battle for control between self-organizing information and the entropy that would dissolve it into noise’ (2019: 156). One way, this materialized in digital technologies, was through AT&T’s production of long-distance telephones. In order to reduce the noise of long-distance calls to maximize the information relayed, ‘the solution reached was to compress messages into a binary code that *eliminated all surplus*, leaving only the elements necessary to decompress the full message at the output end’ (156–157).

By the 1980s, when digital technologies began spreading in earnest in the music industry, the ability to convert musical signals into ones and zeros allowed for greater precision, attention to micro-details, and the elimination of background noise. When we hear music that has been digitally recorded, we hear ‘no noises accompanying them’ (Brøvig-Hanssen and Danielson 2016: 61). The silence of the sounds, then, helped listeners acknowledge the previously unheard noise in musical recordings. Once we utilize these technologies, they train us in listening and hearing, so that we listen for—and as a result, hear—signals and codes rather than noise. To the extent that we listen for and hear noise, we do so in an effort to eliminate it or—what may amount to the same thing—transform it into information.

#### 4 Listening and the Postdigital Human

Faced with the overabundant noises of the lo-fi megalopolis, Schafer wants to enact a pedagogy of *clairaudience*, which entails *cleaning hearing* or *cleaning the ear*. This entails sensitizing the ear to the lo-fi sounds, so that the ear can effectively digitize the exhaustive babbling of the metropolis. There is nonetheless a glaring paradox in the project, for although Schafer wants us to acknowledge the world as one big orchestral soundscape in which we are all listeners and composers—an orchestra undoubtedly populated with digital technologies—the ultimate module, agent, and model is the ‘human ear’. His main objection with the contemporary lo-fi soundscape is that ‘human vocal sounds are masked or overwhelmed’, which produces ‘an inhuman environment’ (1994: 207).

In response, we have to reorient ourselves to the soundscape through the model of the human ear, which he states are the best machines for listening. ‘The human ear’, he writes, ‘conveniently filters out deep body sounds such as brainwaves and the movement of the blood in our veins’, while ‘the human hearing threshold has been set conveniently just beyond a level which would introduce a continuous recital of air molecules crashing together’ (Schafer 1994: 207). The human machine is therefore silent not because it is soundless, but because it eliminates the noise of the body and filters out unwanted or undesirable noise. ‘The perfect machine’, he writes, ‘would be the silent machine: all energy used efficiently. The human anatomy, therefore, is the best machine we know and it ought to be our model in terms of engineering perfection’ (207). Moreover, although he acknowledges the importance of listening habits and practices, he leaves these unproblematized as he moves

to pedagogy and design. For example, his pedagogy is guided by questions such as ‘What sounds do we want to preserve, encourage, and multiply?’ (205). Yet the answer to these questions will hinge on what and how we can hear and listen, which are in turn bound up with our assumptions of and dispositions toward intelligence, information, and noise. Bringing his concerns and pedagogy to the postdigital era, what exactly is the human ear and the human anatomy? If the contemporary postdigital human listens differently from its previous iterations, what are these differences, and how can these differences inform a pedagogical project aimed in a liberatory direction?

To get at one approximation of this, we can return to the different sonic technologies of the late twentieth century and extend Schafer’s insights into the revolutionary transformations in listening brought about by the radio and the cassette. In his study of Islamic soundscapes and the role of cassette sermons in the Islamic Revival, Charles Hirschkind examines the revolutionary transformations in soundscapes inaugurated by the Islamic cassette recordings in Egypt. One break with the proliferation of cassette recording and playing technologies is that they undermined the previously dominant centralized forms of broadcasting and film, a subversion ‘indebted in no small way to the weakening of copyright protections in the face of the possibility of infinite duplication afforded by the cassette’ (Hirschkind 2006: 53). Indeed, while we might associate the cassette as a pre-digital technology, with Cramer (2015) we can understand that it is a fully digital technology in that it renders the analogue sermon into a discrete and reproducible unit. Moreover, cassettes facilitate postdigital listening by ‘floating free of subjects’, which means their listening ‘is now left to the whims of subjective appropriation’ (Hirschkind 2006: 91). They are also free from the authority of the state, which is unable to contain their production, reproduction, and distribution. Indeed, in Egypt, most tapes ‘circulate through informal practices of exchange and home duplication’ (60). Efforts to distribute Islamic cassette sermons by the state and traditional authorities have largely failed to take hold. While people can listen to cassettes privately, they are also broadcast in and outside cafes, restaurants, taxis, and cars, creating ‘what might be called Islamic soundscapes, ways of reconfiguring urban space acoustically through the use of Islamic media forms’ (6).

The specificities of the role of listening in Islam are important, and they might hold keys to understanding and reconfiguring posthuman listening in the rest of the world as well. This is a kind of ethical listening that is not organized around the *grasping* or *consumption* of the content but the affective disposition of the listener. As the Quran is sublime in that it cannot be fully interpreted or understood, its force must be felt. Islamic scholarship, he notes, has generally not articulated rules of *speech* but instead ways of *listening*. When a sermon fails, it is because of the listener and not the orator. ‘The agency’, he notes, ‘is largely attributed to the hearer... *Sam*, in other words, is not a spontaneous and passive receptivity but a particular kind of action itself, a listening that is a doing’ (Hirschkind 2006: 34).<sup>1</sup> Thus, these

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<sup>1</sup> *Sam* is one mode of listening in Islamic traditions that entails one’s ability to actively listen and hear the words of God.

listening practices might help the ‘ear cleaning’ project Schafer proposes, but without constructing an artificial binary between the digital and the human. The urban soundscape is not a lo-fi environment to militate against, but rather a rich sonorous site of struggle in which to intervene. For Hirschkind and those he interviewed, their listening was a kind of posthuman listening that was transformed by the digital technology of the cassette and the particular relations it enabled and opened. This is radically different from a form of listening oriented around the attempt to capture as much *information* as possible.

The limitation for listening like a postdigital human here is, of course, the location of agency. As such, a closer approximation to a liberatory sonic pedagogical project might be those that more concretely challenge the limitations that restrictively define the human and agency in general. In terms of the pedagogy of listening, one of the most dangerous practices concerns that naturalization of vocal timbre. Nina Sun Eidsheim introduces this by way of the acousmatic question that the listener is asked: *what* or *who* am I hearing? This question assumes that we can discern an answer, identify a source, and generate knowledge about the source (person) and the sound (voice). Yet the very reason for asking the question is because we cannot formulate an answer; ‘we ask the question because voice and vocal identity are *not* situated at a unified locus that can be unilaterally identified’ (3). She turns the question around so it is asked of the listener’s listening: ‘*Who am I, who hears this?*’ (Eidsheim 2019: 24). Timbre is not a knowable thing but a process. By naming and measuring sounds, we block the infinite potentiality of timbre by insisting on limited concrete actualizations. While timbre is an errant phenomenon that cannot be pinned down, it ‘is often used to make truth claims about voice and the person emitting the vocal sound’ (5). This means, in turn, not only that (vocal) timbre is seen as a unique and genuine product of an identifiable subject, but also that the pedagogy of timbre—how we come to voice and listen—reproduces systems of oppression, to the extent that ‘the practice of essentializing vocal timbre is the unexamined foundation upon which racialized vocal timbre is maintained’ (154).

Both in formal and everyday settings, ‘we are conditioned to *hear what we listen for* and to assume that what we hear is indisputable’ (Eidsheim 2019: 50), so that when ‘we subsequently hear them, and because we hear them, we believe the perceived meaning to be verified’ (51). This is most evident when there is a gap between what we are listening for and what we hear. One striking example she offers is of Angelina Jordan, a young Norwegian girl, performing Billie Holiday’s ‘Gloomy Sunday’. The disbelief and shock that strikes the audiences (on the TV show on which Jordan performed, in the audiences where Eidsheim has presented her research and that strikes Eidsheim herself) is the disruption of the belief that the voice is an essential expression of a unique identity. Holiday’s voice has been essentialized as the expression of Black suffering and her own particular autobiography; it is heard as an expression of a story of Blackness and her own story of hardships, tragedy, and so on. How could this young girl from Norway then sound so similar?

The disruption is pedagogically powerful but also ambiguous. On the one hand, it can strengthen our commitment to timbre as essence. Here, ‘the listener holds an image of an original voice in his or her mind, comparing it with the evidence avail-

able as a more or less favorable reproduction with a greater or lesser degree of fidelity' (Eidsheim 2019: 164). In other words, *timbre as timbre* is not heard. On the other hand, the relationship between timbre and essence can be weakened. When we hear 'both the voice of the singer at hand and that voice inflecting the idea of the imitated voice', we should be moved 'to question the very foundation upon which the assumption of vocal essence rests' (165). The pedagogical task, then, is to listen to our listening. For Eidsheim, this pedagogy consists 'of demonstrating that the practical experience of exploring more of the wide range of timbral potential inherent in each voice offers a perspective on any single timbre' (57), so 'that every timbral quality or meaning may be interrogated' (58). Timbre itself, as a limitless potentiality, does not *possess* or communicate any meaning; instead 'any and all meaning is generated outside the form' (184). This does not mean foreclosing the political, but rather holding politics in tension with potential. When we realize that 'a collection of styles and techniques is distinguishable through one name, it may also be distinguishable through another name, and another, and another, and yet another' (193). The infinite potentiality of timbre is manifested *through* each particular actualization, a process that challenges presumptions about the 'essence' of the human.

A postdigital example of this pedagogical process can be found in autotune technologies. Interestingly, autotune was developed to correct or enhance vocal sounds by eliminating divergences from the intended pitches and frequencies of the sounds. In a sense then, they were developed to closedown the possibilities of timbre. However, over time other potentials of autotune were explored in ways that foregrounded the digital intervention in—or interaction with—the voice. Here, the machine's voice merges with that coming from the human: 'When the voice is manipulated and takes on a mechanical or robotic sound, this link to the real "self" of the singer is broken' (Brøvig-Hanssen and Danielsen 2016: 128–129). Since our dominant assumptions link the voice to a human essence—and thus deprive those without voices or whose voices are not heard to the status of agents—the overt autotuning of the voice continues to be controversial. Moreover, the autotuned voice is disturbing. When the voice as an assumed instrument linked to the interiority of the human is blended with the digital in such a way, as Dominic Pettman puts it, we realize that 'there is something profoundly *impersonal* about the voice, something alien' (2017: 39). The boundaries between the human and machine are blurred, and the voice of each emerge with their own limitations and potentials.

## 5 Conclusion

It is possible to hear and listen to their sonic choreography in ways that unsettle assumptions of the clear boundaries between the human and machine and the link between the voice and an interior essence and, as a result, the perceptual biases that

ontologically order agency. This is precisely where its liberatory possibility lies, since autotuned voices become generalized throughout so many genres of popular music. It becomes impossible to tell where the machine ends and the human begins and, thus, where to locate the intelligence of the sound. This, in turn, destabilizes our conceptions of sound and the binary between sound and noise. This could represent an insurrection in the current ontological and epistemological regimes that privilege not only ‘the human’ but particular forms of the human.

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