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Voice and the Selfs of Technology

Abstract: Weil menschliche Stimmen sowohl in den menschlichen Körper als auch in die sozialen Rahmenbedingungen eingebettet sind, in denen sie erklingen, werden externe Stimmtechnologien häufig mit dem Posthumanen in Verbindung gebracht. Derlei Technologien können jedoch nicht nur die Möglichkeiten des organischen, menschlichen Klangs übersteigen; sie können sie auch erweitern. Der folgende Beitrag liefert einen Überblick über Teile der aktuellen technologiebezogenen Stimmforschung. Menschliche Stimmen wurden immer auch als Technologien des Selbst untersucht. Sie inspirierten die Erfindung künstlicher Stimmen lange vor dem Aufkommen digitaler Technologien. Sie waren Ausgangspunkt für die Hybrid- oder Cyborg-Stimmen, die heute mehrere Bereiche des Alltagslebens durchdringen. Sie werden als so wichtig für die Kommunikation erachtet, dass der Drang besteht, verlorene oder fehlende Stimmen zu ersetzen. Von veränderten bis zu künstlichen Stimmen, von Stimmbibliotheken bis zu Stimmdatenbanken möchte sich dieser Beitrag insbesondere auf das Verhältnis von Stimmtechnologien zu Vorstellungen und Praktiken von Identität, Fertigkeit und körperlicher Einschränkung konzentrieren. Obwohl Musik dabei nicht das Hauptthema sein wird, spielt sie eine wichtige Rolle bei der Diskussion von Stimmen, die an Sampling-Bibliotheken verkauft werden, künstlichen Singstimmen und Stimmen von Menschen mit Behinderung im Kontext populärer Musik.

Abstract: In part because human voices are embedded in both human bodies and the social frameworks in which they sound, external voice technologies are often associated with the posthuman. But such technologies can not only exceed the capabilities of organic, sonic humanity; they can also amplify them. This article will provide an overview of some current voice research related to technology. Human voices have been investigated as technologies of the self; they have, since long before the advent of digital technology, inspired the invention of artificial voices; they have served as foundational to the hybrid or cyborg voices that now pervade multiple aspects of daily life; they have been considered so essential to communication that lost or absent voices demand replacement. From altered voices to artificial voices, from voice libraries to voice banks, the article will focus particularly on the relationship of voice technologies to ideas and practices of identity, ability, and disability. Though music will not be the primary topic of the

article, it features prominently in discussions of voices sold to sampling libraries, artificial singing voices, and disabled voices in popular music.

1 Posthuman Voices

Late in his life, Michel Foucault famously identified four types of epistemological technology through which humans learn about themselves, and through which power structures are produced: 1) technologies of production, 2) technologies of sign systems, 3) technologies of power, and 4) technologies of the self. The latter, he wrote, "permit individuals to effect by their own means or with the help of others a certain number of operations on their own bodies and souls, thoughts, conduct, and way of being, so as to transform themselves in order to attain a certain state of happiness, purity, wisdom, perfection, or immortality" (Foucault 1988, p. 18). Musicologist Nina Sun Eidsheim has positioned voices, vocalities, vocal pedagogies, and the act of listening to voices within such a framework (Eidsheim 2008), and as Annette Schlichter notes in response to Eidsheim, this perspective requires the study of "mediation and modulation of the voice through sound technologies" (Schlichter 2011, p. 44). Eidsheim herself has examined the construction of race in the voice synthesis application Vocaloid (Eidsheim 2009), and as voice synthesis continues to grow in cultural presence and significance, it is important to reexamine the ways technology can mirror or change the power structures in which voices are sounded and heard.

In part because human voices are embedded in both human bodies and human social frameworks, external voice technologies are often associated with the posthuman. But the concepts of "posthuman" and "posthumanism" have been assigned multiple, competing meanings, as Cary Wolfe details in *What Is Posthumanism?* It has been associated with what comes after humanism, and with the idea of abandoning or transcending embodiment. Wolfe's own definition of posthumanism involves both the before and after spaces of humanism:

> before in the sense that it names the embodiment and embeddedness of the human being in not just its biological but also its technological world, the prosthetic coevolution of the human animal with the technicity of tools and external archival mechanisms [...] [but] it comes after in the sense that posthumanism names a historical moment in which the decentering of the human by its imbrication in technical, medical, informatic, and economic networks is increasingly impossible to ignore. (Wolfe 2010, p. xv)

I suggest that this understanding is key in the study of voice and technology – as is the related idea that technologies can not only transcend the capabilities of organic, sonic humanity, but also amplify them. This article will survey recent voice research related to technology. Human voices have been investigated as technologies of the self (Eidsheim 2008); they have, since long before the advent of digital technology, inspired the invention of artificial voices; they have served as foundational to the hybrid or cyborg voices that now suffuse multiple aspects of daily life; they have been considered so essential to communication that lost or absent sonic voices demand replacement. From altered voices to artificial voices, from voice libraries to voice banks, the article will focus particularly on the relationship of voice technologies to ideas and practices of identity.

2 Voice Assistants

The increasing popularity and ubiquity of voice assistants and similar AI demands a reevaluation of the relationship between voices and bodies. Some AI voices are drawn from modified recorded human speech and song, while others are fabricated whole-cloth through acoustic design. But whether or not a human body (or group of bodies) initially produced the sound, people attach bodies to the voices they hear – and, as Eidsheim writes, produce those bodies through listening practices rooted in systems of power (Eidsheim 2015). AI voices are not exactly acousmatic. We can see that Alexa's voice emanates from a squat cylinder or spherical speaker, or Siri's from a rectangular smartphone whose weight we feel in our hand. But those are not the bodies we build for the voices in our minds. Those voices *sound* human and feminine, or rather, to an extent, we listen to them as if they were human and feminine, as we insist that they do our bidding. But they are somehow at once human and not-human, a cyborg concoction of voice that has been disembodied and reembodied in the machine. And yet these voices are becoming part of millions of lives, establishing a *kind* of relationship, at least, largely due to the significance placed on voice in human communication. As Julie Carpenter explains, we "know that voice is a cue for our relationship with an Other – even a technological one" (Carpenter 2019, p. 58).

Siri's original sound was built on the voice of actor Susan Bennett. Bennett did not know how her work would be used, or for what technology, when she recorded hours of speech to be mined for vowels, consonants, and syllables (Ravitz 2013). The default vocal sound for most of these devices is coded as feminine, though other voices can be accessed or downloaded (for example, "Alexa" may become "Samuel," using actor Samuel L. Jackson's voice). But in 2014, a team at Vice Network's

design branch Virtue developed a voice under the name Q, which they describe as "nonbinary," with the idea of allowing AI voices to represent the spectrum of gender identity more fully. As Julie Carpenter, a research consultant for the project, recounts, project lead Emil Asmussen was inspired by a talk about hidden bias in artificial intelligence, and thought, "The world is increasingly acknowledging [many] gender options; why are there still only two options in AI? AI is born genderless so it seems stagnant that there's not a genderless option" (Carpenter 2019, p. 58). Carpenter argues that because the designers of persona-driven AI – home assistants, GPS, telephone voice systems – understand how significant gender cues are for consumers, and because the exclusion of identity groups in media representation is experienced as a kind of erasure, designers have a responsibility to be inclusive of a spectrum of gender identities (Carpenter 2019). She writes that the design process included the recording of six speakers identifying as "male, female, transgender, and nonbinary" (though it should be noted that these identities can overlap – "transgender" identities can include binary male and female as well as nonbinary identities), combined them, manipulated pitch and timbre, and applied a formant filter. Thousands of people were surveyed to "rate" different results, and the team found that a particular pitch range helped to define the preferred voice heard as nonbinary. In Project Q, a voice technology is working to subvert power structures that privilege a binary gender framework both in the marketplace and in social roles.

3 Pandemic Voices and Ability

The global COVID-19 pandemic has changed many things – how people work, how we communicate, how we establish and maintain community. But one of the earliest and perhaps least anticipated changes has come in the way we relate to voice. Some of the first pandemic-related footage to "go viral" in January 2020 featured Wuhan residents shouting "*jiāyóu*" ("add oil" in Cantonese, an expression of encouragement like "stay strong") out their high-rise windows, to raise morale (Wang 2020). And as the virus hit Europe and the death toll there similarly drove populations inside and away from each other, social and news media around the world transmitted videos of chanting in Wuhan now intended to articulate solidarity with those in Italy. Italians themselves chanted "andrà tutto bene" ("everything will be fine"), and videos showing them singing patriotic songs, distanced, from their balconies filled Twitter (Kearney 2020) – people calling to each other, like parrots separated from their flocks, to keep in contact, to keep up their spirits, raising voices to remind each other that no one is alone.

Shortly after these sounds and images spread, 53 members of a choir in Washington State became ill with COVID-19, and two died. The March 10 rehearsal attended by an unknowingly infected singer was later described as a "superspreader" event (Hamner et al. 2020; Johnson 2020), and the Centers for Disease Control and Prevention (CDC) in the U.S. briefly posted guidelines for faith communities that included a warning recommending suspension of choral singing and a statement that "the act of singing may contribute to transmission of COVID-19, possibly through emission of aerosols." After debate with the White House, where President Trump's administration did not recommend the interruption of in-person worship, the CDC removed those statements. But choirs at schools and faith institutions everywhere went online, members recording individually with their voices edited together by enterprising directors. Screens with a patchwork of faces and shoulders, microphones and headphones, have become standard, and though many are pleased with the results, singers and conductors nevertheless lament the loss of simultaneous sonic creation. Some have invented alternative modes of rehearsing and performing while socially distanced. In early 2021, National Public Radio (NPR) in the U.S. reported on "car concerts," developed by voice instructor David Newman at James Madison University in Virginia, which allow singers to sit separately in their vehicles with wireless microphones, a mixer, and an FM transmitter (Kravinsky 2021 and Newman 2020), hearing each other's voices simultaneously without the delay inherent in Zoom gatherings.

It is fortunate that these technologies have been available to many during the pandemic. Though they cannot replace the kind of in-person interaction and music making that is widely preferred, they do make singing together accessible, and have been serving such a purpose since long before COVID-19 turned singing upside down. In 2017, I attended a virtual music festival co-organized by Kaeley Pruitt-Hamm, one of the singers I interviewed for my book *Multivocality*. It was called BedFest, and featured participants with chronic illnesses – who had all recorded videos from their beds. The festival organized dozens of entries submitted by musicians, visual artists, and activists. BedFest was created based on the precedent of Bedstock, a 2016 virtual concert in which celebrity musicians performed from beds as a way of supporting children with serious illnesses, who would not be able to attend a concert at a public site. But BedFest was something new in that it offered an online venue to musicians who were themselves too ill to perform at a physical concert venue. 79 videos were posted on YouTube, from musicians in the U.S. and Puerto Rico, the U.K., Canada, Australia, Spain, Germany, Norway, Sweden, and the Netherlands. They mostly had been made by women, and spanned all age groups. The festival began with a conference video call for over 100 participants, using BlueJeans Video

Communications, and the artists spoke about their entries and experiences. One entry came from a UK group called Chronic Creatives Choir, whose artists' page at the festival described it as comprising seven singers, flute, and harmonica. The ensemble's bio reads:

> We're a choir made up of people with chronic illnesses (most of us have M.E.) [Myalgic Encephalomyelitis]. Although we're not well enough to join ordinary choirs, we've been able to make music together long-distance. We each record our parts at home separately, in some cases from bed. Some of us have to record in short sessions due to the illness, rather than doing the whole song at once. I then combine all the parts on the computer.[1]

The 21st century emergence of internet communities focused on shared health conditions has modified the experience of illness for many, so that it is often more public – at varying levels – than private (Conrad et al. 2016). And the possibility of listening ears, even digitally mediated as at BedFest, inspires community members to use their material voices in an agentive way.

In 2021, virtual concerts are routine and expected, an example of a phenomenon disability activists have noted: for years, disabled people have been denied work and cultural access through technological accommodation, and the pandemic has demonstrated that such accommodation was possible all the time. It remains to be seen whether the accessibility provided to broader populations during the era of COVID-19 will remain for disabled people when the virus becomes less of a threat.

While voices have been brought together through new technological devices or new uses of older technologies, voice has also become the focus of research looking for sonic indicators of COVID-19 infection. The diagnostic study of voice is not new in itself – some illnesses, like Parkinson's Disease, can impact voices in obvious ways and have been the subject of many studies. But the invention of new technologies to detect and model voiceprints of diseases and disorders – dementia, depression, and more (Anthes 2020) – is accelerating. And in the early months of the COVID-19 pandemic, medical researchers and practitioners have noted many potential ways to involve the smartphone, a widespread technology, in home health monitoring for the virus. In addition to the development of voice-assistant apps for symptom assessment and remote monitoring of temperature and lung function (Behar et al. 2020), the year 2020 saw the study of unique acoustic properties in the voices of COVID-19 patients. The Vocalis Health Company (headquartered in Israel and the U.S.), along with the Israeli Defense Fund and multiple academic groups, have been collecting and analyzing the sounds of breathing patterns, coughs, and speech in

people with and without COVID-19. Vocalis had already invented a smartphone app to identify the sounds of obstructive pulmonary disease, and set out to develop a similar tool for COVID-19 after the pandemic began (Anthes 2020). Though the study must be supplemented with further investigation, the researchers write that the results of their work so far "have demonstrated the feasibility and effectiveness of audio-and-text-based COVID-19 analysis, specifically in predicting the health status of patients" (Shimon et al. 2021, p. 1123).

Another project aimed at the identification of vocal biomarkers is the Voiceome Study, created by NeuroLex CEO Jim Schwoebel. In his Indiegogo campaign page, he explained that he was motivated to establish NeuroLex when his brother, after years of symptoms, had a psychotic episode and was diagnosed with schizophrenia. Schwoebel listened to voicemails his brother had left him in the years leading up to his hospitalization and began to see them as a data set that might be analyzed for vocal signs of disorder. Schwoebel wrote that his project

> aims to commercialize a universal voice test to refer patients to specialists faster. You can think of our company kind of like a Quest Diagnostics but for speech tests in the cloud. In this way, patients like my brother could be diagnosed and treated earlier, leading to better outcomes (e.g. lower duration of untreated psychosis) and lower costs ($15k→$3-5k) through more informed referrals (e.g. primary care physicians to psychiatrists).[2]

According to the Voiceome Study's website in early 2021, the project aimed to collect 10,000-100,000 samples of speech by December 1, 2020, to "create the largest dataset in the world of voice data tied to health traits and publish our work openly in peer-reviewed journals."[3] Though results have not been published yet, the Voiceome project stands to demonstrate new potential uses of voice analysis in many areas of health.

The Voiceome Study collects voice donations, and it is not the only project to do so. The company VocaliD has built a voice "bank" from donated speech samples, which it uses to develop prosthetic voices as assistive technology. According to VocaliD's origin story as told by their website, speech scientist Rupal Patel attended a conference in assistive technology and noticed that hundreds of people, regardless of age or gender identity, were using speech devices with the same voices, the only ones available. "We wouldn't dream of fitting a little girl with the prosthetic limb of a grown man, why then was it okay to give her the same prosthetic voice as a grown man?", the site asks.[4] As explained in Patel's 2014 Ted Talk (Patel 2014), the voice (speech) samples donated to the bank are modified acoustically and if necessary

combined to tailor a digital voice for an individual client – one that matches the client's sense of identity. The digital voice acts as a prosthesis in the sense that it is replacing something that may or may not have ever existed but is expected to exist, in an ableist world that prioritizes spoken communication. Sara Jain has asked, though, whether the voice that sounds from a throat might not also be considered prosthetic, "a device (trained, disciplined, accented, and pitched through many screens of personal, educational, and cultural intervention) through which agency is established, communicated, asserted" (Jain 1999, p. 41). Jain cautions against the overuse of the "prosthesis trope" in critical theory, reminding readers that prostheses may not only carry the connotation of replacing something understood as missing, but also reinforce the ideological imagination that something is missing in the first place, thus disabling bodies and fulfilling their perceived need at the same time.

VocaliD's work also raises important questions about voice and what Jonathan Sterne, after Jacques Derrida, calls the "metaphysics of presence," in which voice is taken as an indication of subjectivity, of uniqueness in the world. Sterne writes about his own experience that challenges those ideas. Using a personal voice amplifier (which he semi-affectionately calls "the dork-o-phone") after developing vocal cord paralysis following surgery, he recognizes that "my voice and its relationship to my subjectivity vary day by day, and sometimes by the hour." He continues: "If a single subject like me has *voices*, how can there be a single 'the voice' to theorize?" (Sterne 2019, p. 180). For Sterne, his vocal prosthesis complicates the social model of disability, which has long been critiqued for neglecting the realities of impairment. And the technology means that for him, each speech act "raises anew the relationship between intent and expression, interiority and exteriority" (Sterne 2019, p. 187).

4 Voices in Music

In spite of the ubiquity of sonic and visual enhancements in popular music, it remains a site of intense discourse about bodies, voices, and technologies. Perhaps no vocal prosthesis has received more public analysis or critique than Antares Audio Technologies' Auto-Tune software. Since its release in 1997 as a pitch-correction tool, it has sowed seeds of distrust among music consumers. It is still used for its original purpose, particularly among men producers working with women singers – Catherine Provenzano's work has supported the idea that women are disproportionately the targets of Auto-Tune for "cosmetic" or vocal enhancement purposes, and are criticized for it whether or not such application is

done with the artist's consent. Provenzano argues that men who use Auto-Tune are "afforded 'artistic,' 'creative,' and 'emotional' authenticity that Auto-Tuned female voices are rarely given" (Provenzano 2019, p. 65). And Robin James has noted the historically rooted positioning of both "femininity and technological progress as sites of emasculation and passivization" (James 2008, p. 416). She also examines the use of Auto-Tune by Black women artists, such as Rihanna, as part of a 21ˢᵗ century Afro-Futurist aesthetic that serves as a way of "reverse-engineering the body, using music to rewire the way whiteness and patriarchy are programmed into [Black women's] bodies and structures of feeling" (James 2008, p. 419). Auto-Tune and other voice manipulation technologies also haunt the vocal soundtracks of science fiction films. Cornelia Fales has written about the alienness of the modified Diva's voice in *The Fifth Element* (F 1997, D: Luc Besson), which produces sounds both coded as human and as non- or perhaps post-human, as indicated by the sudden onsets in rapidly sung melismas (Fales 2005). Similar sonic alterations feature in A.R. Rahman's soundtrack for the unprecedentedly expensive 2010 Tamil-language Indian film *Robot* (*Enthiran*, 2010, D: S. Shankar).

Amid a trend that finds popular musicians donning prosthetic makeup and CGI in temporary body modification both in and beyond music videos and staging – The Weeknd, for example, in an elaborate series of appearances meant to suggest facial surgery for cheek implants that he did not actually undergo (Nugent 2021) – some artists are turning to narratives of even more extreme technological prosthesis. In 2014, T-Pain was part of a joke video on the tabloid television program *Dish Nation* about developing an Auto-Tune implant, and in January 2019 Atlanta hip hop artist Nessly claimed in a viral video that he had had the technology implanted in his arm, seemingly showing it off and using it[5]. Antares even posted the video on its website. Later in the year, the site NewLevelNews.net featured a story on digital media artist Nicholas King (known as Nickels), who had also posted the video in January, and attributed Nessly's viral video to his work (Nickels (Nicholas King) is the Artist 2019).

It is becoming more common to combine attributes from multiple voices in sampling libraries to synthesize a new, unique voice – but libraries built on a single human voice still exist, marketed to professional and amateur composers who for various reasons need to make demo recordings without hiring live singers. In 2013, my friend Nichole Dechaine was hired to be the voice of such a sampling library, the soprano in Soundiron's choral-themed *Voices of Rapture* package. "I sold my voice," she told me a few months later (personal communication, 10 June 2013). An in-demand singer and vocal instructor in California, Dr. Dechaine had signed a contract that allowed the use of her voice in the software package, which provides the building blocks of vocal music to composers. She recounted to me how she

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worked for three long days in a Bay Area recording studio singing through all twelve keys and her entire range, producing sets of single pitches sung on vowels, melodic phrases without text, and phrases sung or spoken in English, Latin, and French. She improvised and sang pre-written phrases for hours at a time, exercising her pianissimo and forte, vibrato, straight-tone, all the legato intervals between half step and octave, chromatic scales, and whole-tone scales. Now, for $119, anyone can essentially check out her voice from the sampling library – an acousmatic voice detached from her performing body – and manipulate its 17,310 samples to produce music that she's never heard, let alone sung herself.

The producers at Soundiron separate their library from others like the widely used voice synthesis software Vocaloid, explaining that their package features "true legato" – the sampling of all those intervals Dr. Dechaine recorded leads to what they hear as a smoother, more human sounding transition between pitches – rather than the choppy onsets Fales (2005) identifies in her work on the *Fifth Element* Diva as sonic indicators of the non-human. In contrast, because the voices packaged by Vocaloid capitalize on, and in general do not disguise their origins in technological alteration, transitions between phonemes, as well as onsets and offsets, may be perceived as mechanical or robotic. Vocaloid allows users to plug a voice into any lyrics, a function not offered by *Voices of Rapture* – so composers using the latter write a lot of vocalizations on vowels, and use only words within the limitations of the pre-packaged poetry Dr. Dechaine sang during her recording sessions.

In our first discussion about *Voices of Rapture*, Dr. Dechaine was anxious about the use of some sounds that had been sampled without her knowledge. Soundiron's web page for *Voices of Rapture: The Soprano* features different tracks created by thirteen composers.[6] In them, Dr. Dechaine is heard above digital piano or digital orchestra, or in a multi-voiced choir of her layered voice. But one example featured the sounds of her clearing her throat, singing in manipulated layers with an artificially wobbly vibrato, whistling, and at the end, laughing. The first time she listened to the sample compositions, she was surprised to hear not only her singing and speech, but also these other incidental sounds: "That's not something that I thought would be included in the library," she told me.

> I thought it would just be the exercises that they asked for, and the improvi-sations, minus, you know, where it was an obvious sort of outtake. In another composition there's a – a composer used an excerpt where I'm improvising, and I had to clear my throat, I had phlegm, and so – my voice didn't really crack, but you can hear that there's something, there's a flaw, right? So I had stopped in the recording and I thought, "oh, they'll edit that out," made an

assumption, and no, and I guess the composer liked that sound or that quality and he used it in the composition. So that was surprising. (Interview, 7 July 2013)

When I asked her whether she felt that those sounds were *part* of the voice, she said, "No, I felt that was just me being a human." And she thinks about the use of her laugh as something even more personal than the sampling of her singing:

Because I think it reveals more of my personality – it's attached to my personality, and to my own expression as a human and not as a singer, where my voice, you know – I am attached to it, it is my identity, but I'm kind of used to sharing it with others, and being paid to share it with others [laughs], where I haven't – I've never been paid to laugh [laughs] or to give that up for someone to use in a way that I wasn't expecting.

Later, she added that although she has a doctorate in vocal performance, "I haven't had any *training* in throat clearing."

The development team behind Soundiron – Mike Peaslee, Gregg Stephens (editors and recordists), and Chris Marshall (programmer) – consider the non-singing sounds they sampled not only as signs of human-ness, but also of a particularly living sound, and of Dr. Dechaine's distinctive identity. Mr. Peaslee told me:

All those pieces are so integral to a vocal performance. They're used a lot in pop recordings and modern recordings. They're the things you kind of would exclude from a symphonic recording, usually, because they're – you'd consider them impurities, but those are things that... to make it sound like it was convincingly sung by a live performer, those breaths need to be there. A user might put them really low in a mix, but just before a line, you know, that can add tension, it can add weight to the line that's about to be sung. So that's – in that way, we actually include a section of playable breaths with each subset of phrases and sustains that we offer in the different presets within the library, so that they're always right there ready for you... And it just – it makes it that much more alive. Throat-clearing and all that stuff – some of it's kind of for fun, but a lot of it really is also – you know, people use it. It gives that much more life. It adds that much more personality to it. (Interview, 11 July 2013)

In *A Voice and Nothing More*, Mladen Dolar discusses a famous case of hiccups that interrupts Aristophanes during a speech in Plato's *Symposium*. Regarding the hiccup, Dolar theorizes that

the involuntary voice rising from the body's entrails can be read as Plato's version of mana: the condensation of a senseless sound and the elusive highest meaning, something which can ultimately decide the sense of the whole. This precultural, non-cultural voice can be seen as the zero-point of signification [...] the point around which other – meaningful – voices can be ordered, as if the hiccups stood at the very focus of the structure. The voice presents a short circuit between nature and culture, between physiology and structure; its vulgar nature is mysteriously transubstantiated into meaning *tout court*. (Dolar 2006, p. 25-26)

The inclusion of non-singing sounds in the *Voices of Rapture* library can be understood to offer such a central meaning, across genres, providing tiny sites for the intersection of the human and posthuman.

Our initial talk about Dr. Dechaine's vocal venture occurred a few months following her recording sessions. She had not given the process much thought again, until right before our conversation, when she had listened to the sample compositions on the *Voices of Rapture* website. Now, she was nonplussed, hearing the manipulation of her voice outside of her body. I thought of Eidsheim's work on the marketing of Vocaloid's voice providers and joked that there must be a support group for singers who sell their voices to sampling libraries. Dr. Dechaine mused that if there were one, it would probably be "open to prostitutes, too." Her response was not meant to condemn sex work or treat trafficking lightly, but it alludes to parallels between the two situations that might arise in the complications of selfness when an embodied voice or a body are commodified. In the 21st century, when a number of technologies are capable of manipulating the acoustic materials of voices, such anxieties are not uncommon. In 2017, for example, an online AI service named Lyrebird (after the most renowned imitator of the avian kingdom) was announced, with the purpose of learning the acoustic structures of a speaker's voice, and then producing a "recording" of that voice speaking any words entered as text. News media immediately posted panicked headlines, such as: "Lyrebird Steals Your Voice to Make You Say Things You Didn't – And We Hate This World" (Claburn 2017). Though at least in part meant to be tongue-in-cheek, that headline positions Lyrebird as though it will lead to the kind of identity theft feared by internet users worldwide and to a mutilation of self that resembles a kind of metaphorical mutilation of the body.

And the body is not the only thing at stake. "I do feel like I sold a piece of my soul or something," Dr. Dechaine told me (interview, 10 June 2013). Some of the most persistent stories in Western cultures deal with the metaphorical location of soul or

identity in the voice, and the idea that though a voice seems to be *in* a body, it is never quite *of* a body – it is understood as something spectral enough to be stolen from its bodily house, or corrupted, or even transplanted into another body. Ovid's tale of Echo (in the *Metamorphoses*) begins when the nymph is punished by Juno for talking incessantly to stall her while other nymphs, who have lain with Juno's husband (and brother!) Jupiter, flee the scene. Echo's loquaciousness triggers Juno to punish her by limiting her vocal freedom severely, so that Echo can only ever after repeat what others say. The shame of being unable to control her own voice, especially in pursuit of her love interest Narcissus, causes her body to waste away. Her bones turn to stone, and Echo only remains as a disembodied voice among those stones, inert and only set to motion by – and always subject to – the force applied by others. Ovid describes this condition, in the words of A.S. Kline's translation, as meaning that Echo is "no longer to be seen on the hills, but to be heard by everyone. It is sound that lives in her."[7] She is condemned to be the voice of, and to be heard by, anyone who passes. Dolar writes that the nymph's voice "continues to echo our own voice, the voice without a body, the remainder, the trace of the object." And this very echo is in consistent opposition to the voice of self-presence and self-mastery, he continues, "the intractable voice of the other, the voice *one could not control*" (Dolar 2006, p. 40, my emphasis).

Dr. Dechaine has sometimes contacted me when she thinks she has heard her voice in a television soundtrack or video game, but she is never entirely sure. In this way, she is always looking over her shoulder, listening for the life her own voice is living without her, a vehicle driven by anyone who pays for a license. Her feelings are complicated, though. She appreciates the potential for a kind of immortality. Dr. Dechaine says: "I like that long after I am too old to sing, I can still use my voice and so can my kids." Michal Grover-Friedlander writes that "sound recordings, at times, are voices surviving the body that once produced them; invisible and devoid of body, the singer is somehow there in the presence of voice" (Grover-Friedlander 2005, p. 7). But sampling libraries like *Voices of Rapture* offer something beyond the prospects of simple recording. If *Voices of Rapture* were to persist long enough, it is possible that the vibrations of Dr. Dechaine's voice might continue singing after her death, the echo of the voice *within* her resonating among the stones *without* her.

5 Conclusion

All of these projects tell stories about what the posthuman is, and what it means in 2021. Voice studies, as a broad, interdisciplinary field of inquiry, is increasingly fascinated with what voices do for humans, and what humans do with voices to build,

maintain, and disrupt systems of power. The gendered uses of Auto-Tune and similar applications, for example, and the ways artists and voice designers are employing them to subvert that gendering, push and pull at longstanding normativities. The recent determination to create un-embodied AI servants as voices we can control might be less indicative of creative ingenuity than of a continued global dependence on the processes of colonization and class division that established the practices of servitude in the first place, with AI voice assistants functioning as a kind of metaphorical methadone replacement for societies trying to kick the habit. The mining of voices for medical information offers a path toward minimizing the use of some invasive and expensive diagnostic techniques, and it will be interesting to see how medical corporations respond to such potentially democratizing effects. And if singers can contract for labor that their voices will go on doing without them, who is in control of the formerly embodied commodity? This article has offered these examples not only to give an overview of recent work but also to encourage the further investigation of 21st century voices.

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Notes

1 The artist's page does not indicate which choir member wrote the description, and the "I" is unattributed (https://www.bedfest.meaction.net/chronic-creatives-choir [last accessed July 20, 2021]).

2 https://www.indiegogo.com/projects/the-voiceome-study#/ [last accessed July 20, 2021].

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