“Sounds like” Redemption?

On the Musicality of Species and the Species of Musicality

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Abstract Popular and academic studies of music frequently claim that human musicality arose from the so-called natural world of nonhuman species. And, amid the anxieties produced by the Anthropocene, it is thought that the possibility of reconnecting with the natural world through a renewed appreciation of music’s links with nature may usher in a new era of posthuman environmental consciousness, offering repair and redemption. Intervening in these debates, this article traces how notions of “musicality” have been applied to or denied from nonhuman entities across diverse disciplines since the late nineteenth century. It concludes that debates about the relation between human and animal musics have always reinforced the separation that today they seek to overcome, as this separation is itself rooted in the history of the study of music in nature. The article demonstrates that the study of music in nature has often relied upon an epistemology of origins-listening in which attention to the acoustic is used to formulate implicit evolutionary hierarchies organized along an axis of similarity and difference among species. While who or what is placed within these categories and the relative value of musicality thus derived may have changed over time, this axis of comparison remains in place. As a corrective, the article provokes a new epistemology of listening in which musicality and species are situated becomings.

Keywords music, multispecies, becoming, origins, evolution

Whether invoking whales, birds, gibbons, water, or footsteps, the question of how human music relates to sounds understood to originate from the natural environment has been of profound concern to Western scholars across disciplines for centuries.[1] Very often such inquiries have attempted to get at a wider issue: How to understand the origins of humanity? In the era that many are calling the Anthropocene, the idea that the place of music in human origins may be discovered through the study of

1. See, e.g., Leach, *Sung Birds*; Fitch, “Biology and Evolution of Music.”

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nonhuman animals is taking a future-oriented inflection: it is hoped that understanding the relationship between "humanity" and "nature" through comparative listening might provide new ways to repair the very separation between humans and their environments perceived as being at the root of environmental crises.[2] Attempts to identify the musical among nonhuman species and their echoes in human musicality are heard as acts of human redemption in light of human-caused environmental breakdown.

This is not limited to academic scholarship: the past decade has seen the publication of a wealth of popular science books speculating about the origins of music. In 2011, Mark Changizi published *Harnessed*, in which he claims that the development of language and music was the tipping point that, as his subtitle makes clear, "transformed ape to man." He argues that there is something distinct about language and music that set in motion this project of anthropocentric differentiation. Writing in the online magazine *Wired UK* he surmised that we have a "nature-harnessing instinct;" the "secret sauce" for how writing, speech, and music evolved to fit our brains.[3] In other words: "Because our brains were cut for nature, language and music mimicked nature."[4] For him "musicality" is a human trait, but it comes out of our capacity, our instinct for imitating the natural world. In that view music is not something that is *made* but is instead grounded in the order of nature, of natural instinct.[5] This claim hinges on the relationship between humans and nature being audible. "The fact that speech and music *sound like other aspects of the natural world*," he wrote, "is crucial to the story about how we apes got language and music."[6]

Sounds like. Changizi's ear does a remarkable amount of work here, creating an aural comparison through which temporally concomitant sonic events are arranged into a chronological, causal relationship of original and reproduction.[7] Asserting what has changed sonically (humans) and what has stayed the same (nature), the phrase "sounds like" provides the acoustemological condition for the possibility of establishing equivalence across a wide range of ontologically discrete bodies and species.[8] It is a claim of an essential relationship upon which an evolutionary hierarchy (apes to men) is built. This article critiques such claims.[9] By demonstrating multiple ways in which evaluations of "sounds like" have been invoked to accomplish political and epistemological work, we offer an alternative. The musicality of species and the species of musicality are not givens, a

2. Silvers, "Attending to the Nightingale"; Whitehouse, "Listening to Birds"; Taylor, *Is Birdsong Music?*

3. Changizi, "Secret Sauce."

4. Changizi, *Harnessed*, 5.

5. Ochoa Gautier, *Aurality*.

6. Changizi, *Harnessed*, 11.

7. Sterne, *Audible Past*.

8. James, *Sonic Episteme*.

9. Influential scholars such as Aniruddh Patel (in *Music, Language, and the Brain*) and Steven Mithen (in *The Singing Neanderthals*) have also used music's relation to the natural world to tackle human origins. A landmark study *The Origins of Music*, published by MIT Press, brings together scientists and musicologists to convene around the same question. See Brown, Merker, and Wallin, *Origins of Music*. Among many others, see also Tierney, Russo, and Patel, "Motor Origins"; Lattenkamp and Vernes, "Vocal Learning"; Tyack, "Taxonomy for Vocal Learning."

natural basis from which examination can unquestioningly proceed, but rather entangled becomings. In other words, what Eben Kirksey describes for species as "valuable sense-making tool[s]" applies to musicality too:[10] they are both concepts that in their situated becomings always afford the making of certain political claims.[11]

Musical Anxieties in the Anthropocene

> Every listening practice and its attendant theory arises from and reinforces a particular set of values.
>
> —Nina Sun Eidsheim, *Sensing Sound: Singing and Listening as Vibrational Practice*

Even as the sonic dimensions of old-fashioned interests in evolutionary species hierarchies recede under contemporary anxieties over the audible consequences of human exceptionalism, answering questions about "what made us musical" and by extension about "what made us human" is increasingly seen as a way to fix the environmental problems that "humanity" has caused. The ongoing epistemological investment in the sources and origins of sonic ability has therefore taken a striking turn: posited capacities for musicality are sliding from an index of a species' essence to a causal explanation for biological and cultural diversity (or "what made us human"). In the process the troubling politics of sound and biological reproduction are elided, and decisions regarding what kinds of sounds, and what kinds of bodies, are deserving of care and continuity in this time of socioecological catastrophe are obscured. The politics of such assertions are in urgent need of examination.[12]

These contemporary ideas about the use of a comparative more-than-human musicality figure into what Andrew Whitehouse calls "the anxious semiotics of sound in a human-dominated world." Indexed by the audible decrease in birdsong, Whitehouse suggests, our experience of Anthropocene has become "peculiarly *anxious*" because "it emphasizes our separation from the rest of life just at the moment we connect with it."[13] In light of such audible anxiety, music is being deployed not just to sound out humanity's ethical and taxonomic situatedness in a threatened world but, more specifically, as an act of redemption.[14] Setting aside the question of whether listening can heal perceived divides between humans and more-than-humans, we are interested in the epistemologies that are reproduced through these acts and what they may unwittingly mask or reproduce.[15] Redemption narratives figure prominently in various facets of

10. Kirksey, "Species," 758.

11. Parreñas, *Decolonizing Extinction*; Lowe, *Wild Profusion*.

12. Yusoff, *Billion Black Anthropocenes*; Wynter, "Unsettling the Coloniality," 260.

13. Whitehouse, "Listening to Birds," 62; see also Chrulew, "Reconstructing the Worlds of Wildlife," 137.

14. Another example of what Max Liboiron calls the "rampant fetishization of nonhumans as kin by academics as acts of possession and redemption." Liboiron, *Pollution Is Colonialism*, 109–10.

15. We do not want to deny that there is much to be gained by listening to the other-than-human world. This can offer a practical use to ethnomusicology as well as getting away from ethnomusicology's traditional focus on what John Blacking called "humanly organized sound" in *How Musical Is Man?*, 3.

music studies identifying as ecomusicology, zoomusicology, and biomusicology, among others.[16] Drawing on posthuman scholarship that asks us to make kin with nonhuman entities, such literature is concerned with repairing the human separation from the natural world that is understood to have precipitated the climate crisis.[17] Here music and listening provide, as Ana Maria Ochoa Gautier argues, "the much-needed suture for the torn relations both between humans and between humans and the environment."[18]

What are the implications of the claim that acoustic comparison is a privileged site for yielding redemptive knowledge of musical and/or evolutionary relationships within and between species? Rachel Mundy has powerfully argued that music and sound have acted as a major lens through which the figure of the human has been constructed against that of the animal throughout scientific history.[19] Over two decades ago, Elizabeth Tolbert pointed out that "music's presence in contemporary evolutionary theories signals that it is deeply implicated in Western understandings of human uniqueness and claims to knowledge."[20] And yet music and sound largely continue not to be taken seriously by scholars contributing to Anthropocene discourse outside of the discipline of (ethno)musicology.[21]

Following Ochoa Gautier, Mundy, and Tolbert, alongside scholars who have demonstrated the major role the popular music industry played in the development of harmful industrial technologies and neoliberal ideologies,[22] in what follows we rectify this omission by taking music and its discourses seriously. We suggest that such attempts to heal divides through music and listening are unwittingly reflective and perhaps constitutive, rather than mitigative, of the epistemological and ontological commitments that precipitated ecological devastation.[23] By tracing some of these politics through popular and academic literature, we show how identifying the origins of the "musical" in the "natural" is a way that proponents seek repair and human redemption in the light of rapid environmental change. We argue that while often well intentioned, this search for repair reinforces the separation it seeks to overcome by means of a tacit investment in

16. Allen, "Ecomusicology"; Allen and Dawe, *Current Directions in Ecomusicology*; Allen, Titon, and Von Glahn, "Sustainability and Sound"; Sorce Keller, "Zoomusicology and Ethnomusicology"; Rehding, "Ecomusicology between Apocalypse and Nostalgia."

17. References to works like Haraway, *Staying with the Trouble*, figure prominently in this literature. Yet we wish to emphasize that Haraway herself recognizes the bio- and necropolitics inherent in any project of making kin: "Response-ability," she writes, "is about both absence and presence, killing and nurturing, living and dying—and remembering who lives and who dies and how in the string figures of naturalcultural history" (*Staying*, 28). See also Doolittle, "Animal Sounds or Animal Songs?"

18. Ochoa Gautier, "Acoustic Multinaturalism," 125.

19. Mundy, *Animal Musicalities*.

20. Tolbert, "Enigma of Music," 451.

21. Guilbault, "Politics of Ethnomusicological Knowledge Production."

22. Devine, *Decomposed*; Sterne, *MP3*.

23. Sociologist Murray Bookchin describes this as the "reharmonization of nature and humanity." Bookchin, *Ecology of Freedom*, 11.

what we call an "epistemology of origins-listening" in which attention to the acoustic is naturalized as a way to make known evolutionary hierarchies, which are organized along an axis of audible similarities and differences.[24] While who or what is placed within these categories and the relative value of musicality thus derived has changed over time, this axis of comparison and the hierarchies thus derived have remained remarkably constant. Assertions of musicality and its audible relationship to nature, like ideas of "nature" themselves, consequently become a form of "value-trafficking" in which claims regarding who "sounds like" whom are used to create implicit hierarchies and to buttress and naturalize preexisting values.[25] Such assertions remain committed to a "specific order of rationality"[26] in which particular visions of what it is to be human, animal, and—we contend—musical, are entrenched.[27]

The Musicality of Species

The search for redemption through nonhuman music is not new. Bennett Zon describes how in the Victorian era both scientists (like Darwin) and theologians heard redemption in the nonhuman soundscape. "For science," he writes,

> redemption meant identifying similarities between human music and birdsong which collapsed distinctions between man and nature, and creating a more perfect understanding of man's relation to his world; for theology, redemption meant learning how birdsong reflected man's pivotal, liminal position between the animal and spiritual world, and creating a more perfect understanding of his relation to God.[28]

The act of identifying similarities and differences among the natural world was one that was considered to have redemptive and reparative potency, regardless of your motive. Classification and comparison through identifying musicality or its lack are projects that make audible the historical resonances between European science and theology:[29] both are and were used to define species categories and to repair human ills.

In the eighteenth century classification was considered a cutting-edge science, one that had the potential to make natural history as prestigious as the mathematical sciences.[30] Early classifiers sought to place animals on a spectrum that came to be known as "the great chain of being," "an ancient figure that organized nature as a linked, one-dimensional progression from the meanest animal (or vegetable or mineral . . .) all the

24. Changizi, *Harnessed*.

25. Daston, *Against Nature*, 4.

26. Jackson, "Animal," 683.

27. This reflects the issues with posthumanisms critiqued elsewhere: on how entangled notions of animality, race, slavery, and colonialism have been ignored, see Jackson, "Animal"; Seshadri, *HumAnimal*. See also Wynter, "Unsettling the Coloniality"; Mbembe, *On the Postcolony*.

28. Zon, *Evolution and Victorian Musical Culture*, 42.

29. See, for example, White, "Historical Roots"; Latour, "Facing Gaia."

30. Ritvo, *Platypus and the Mermaid*, 15.

way to humans (or even to heavenly spirits . . .)."[31] Becoming frustrated with this, in the first quarter of the nineteenth century William MacLeay developed a new system of classification he called the "Quinary" perspective. This went further than the simple linearity of the chain of being: classifications were based instead on what he called "affinity" (anatomical likeness) and "analogy" (shared habits).[32] He applied his method not only to animals but to humans, dividing them "into the typical Europeans, the subtypical Asiatics (both 'normal' because 'civilized'), and the aberrant or 'savage' Americans, Africans, and Malays."[33] His approach was extremely popular with the public, even though many scientists disavowed it, including Darwin in 1833.[34] Yet aspects of MacLeay's quinary perspective regarding a search for analogy linger on today.[35]

By the nineteenth century ideas about music were becoming influential to Victorian thought and behavior regarding notions of species and their hierarchies, both in public and academic domains. Scholarship on music had influence well beyond the humanities and shaped much scientific thought, particularly regarding evolution.[36] Of relevance for our claims is the famous debate between Darwin and Spencer, both of whom saw themselves as "trying to fill the gap between the music of modern civilized humans and the primal sounds of their animal ancestors."[37] For Darwin, a biological historian, musical aesthetics, like birdsong, had their root in sexual selection and thus were purely functional.[38] For Spencer, a social historian, all animal sounds were "impassioned utterances," but they were not musical; only humans made true music.[39] Though Spencer and Darwin fundamentally disagreed, they both developed their arguments from an epistemological basis in which "listening to culture and listening to nature merged over a period of several decades to produce a practice of hearing biocultural difference, where song became a measure of other species' worth."[40] Questions of "sounds like" were again central. If humans sounded like birds, Darwin saw this as proof of music's functionality in sexual selection. But, for Spencer, they did not "sound like": while birds were impassioned, only humans counted as musical. In that view the most cultural humans are the ones thus farthest along on the implied evolutionary hierarchy, as their musics depart the furthest from their perceived biological origins in the natural

31. Ritvo, *Platypus and the Mermaid*, 28.

32. Ritvo, *Platypus and the Mermaid*, 31.

33. Ritvo, *Platypus and the Mermaid*, 32.

34. Ritvo, *Platypus and the Mermaid*, 29.

35. As David Shorter has recently demonstrated, commitments to the organizational logic behind the great chain of being persist, underpinning even contemporary scientific projects like the Search for Extra Terrestrial Intelligence (SETI). Shorter, "On the Frontier."

36. Zon, *Evolution and Victorian Musical Culture*; Mundy, *Animal Musicalities*.

37. Mundy, *Animal Musicalities*, 17.

38. Darwin, *Descent of Man*. Darwin also repeatedly evoked Lamarck's phrase "use and disuse" in *The Origin of the Species*. Ahmed, *What's the Use*, 76.

39. Spencer, "Origin and Function of Music"; Mundy, *Animal Musicalities*, 17.

40. Mundy, *Animal Musicalities*, 19.

world. This was a debate about evolution, but it was also one about personhood; "for to be a musician—human or animal—was to be a person."[41] No matter which side of the Spencer/Darwin debate you fell, references to these ideas "became a way to channel such comparisons [between human and animal musics] into an explicitly evolutionary, linear, hierarchical discourse about the relationship between birds, humans, races, and the forms of difference that lay between."[42]

Around the same time anthropologist Edward Tylor also found the "sounds like" question a way to understand the cultural progress of human beings from apes. In his 1865 *Researches into the Early History of Mankind*, he argued that words have the origins in the instinctual imitation of environmental sensory experiences: upon hearing a musket fire "one savage race after another" "named the European musket . . . by the sound *pu*, describing as it seems not the report, but the *puff* of smoke issuing from the muzzle."[43] Similarly, questions asked by the psychologist Conwy Lloyd Morgan in the 1880s and 1890s focused on the question whether animal calls were symbolic (like human language) or involuntary, instinctual expressions of emotion.[44] Most famously Darwin argued "the exercise of an instinct for imitation, still present in humans and their near evolutionary kin, led the progenitors of modern humans to speak the first words."[45] Music was a part of this: "Before man used articulate language, he uttered notes in a true musical scale as does the anthropoid ape Hylobates."[46]

Most troublingly humans, too, were classified in this way: either the musicality of racialized Others made them like animals (again through "sounds like" comparisons) or neither animals nor these racialized peoples possessed musicality, which was seen as the preserve of the upper-class, white European.[47] Because they were perceived as sounding like animals, they could not be classified as human. Here two things become clear. First, that birds or other nonhumans are treated as the pure, the natural biological baseline from which cultural humans have departed in their musical tastes and capabilities. Second, that any likenesses between human and bird vocalizations indicate something about origins. Likenesses become a way to get at a place of epistemological and moral stability among the cultural change that is human music.

These evolutionary narratives continue today. In a recent review article, Patrick Savage applies Darwin's approach to understanding inheritance through the frequency of appearance of certain traits. Denying that invoking evolution implies the thorny issues of race, evolution, and progress, he argues that this is an objective approach: "Evolution

41. Mundy, *Animal Musicalities*, 10.

42. Mundy, *Animal Musicalities*, 27.

43. Tylor, *Researches into the Early History of Mankind*, 15, quoted in Radick, *Simian Tongue*, 28.

44. Radick, *Simian Tongue*, 4–5.

45. Radick, *Simian Tongue*, 36; Darwin, *Descent of Man*.

46. Darwin, "Biographical Sketch," 473, quoted in Radick, *Simian Tongue*, 39.

47. For comparable discussion of how a hierarchical distinction between speech and silence has been used in legal understandings of race and animality, see Seshadri, *HumAnimal*.

simply refers to changes in the frequencies of heritable variants."[48] By simply examining the likenesses and differences between song variants, he reasons, it should be possible to understand how a song has changed over countless acts of transmission (the musical version of inheritance).[49] Yet neither likenesses nor differences are neutral, despite attempts to naturalize them as such.[50] Savage's own research makes explicit use of methods drawn from population genetics to center the musical analogue of the haplotype (what he terms "cantotype") to account for the spread of song features among Indigenous communities.[51] In doing so, he writes the objective continuity of intergenerational sonic criteria into the conditions for the possibility of nothing less than evolutionary relatedness; "sounds like" is no longer a remarkable point of contact but a *natural fact* that proves not just a sonic relationship but an evolutionary one.[52]

A clear example of this logic is demonstrated by cognitive archaeologist Steven Mithen, who seeks to explain similarities and differences between certain humans and nonhuman animal sounds and uses this to inform his ideas of species evolution. While he concludes that great apes are more recent evolutionary ancestors, smaller primates like gibbons and vervets have more humanlike songs because they "chatter" and "sing": they sound like humans.[53] Particularly troubling is his Tylor-esque discussion of human mimicry of the "natural world."[54] Like Changizi, Mithen is convinced by the hypothesis that musicality may have evolved from the imitation of environmental sounds.[55] He therefore uses examples of "traditional" Huambisa people in Peru who make use of iconicity or "onomatopoeia" in their speech. In his perception, because their speech sounds like "nature," this indicates they are "close to nature," indicating in turn that these living peoples are examples of an evolutionary past.[56] This unquestioned assumption of an evolutionary relationship between modern peoples and an ancestral past is a clear parallel to the hierarchical evolutionary classifications defined by audible analogy so popular in the Victorian era.

Yet despite this history, recent searches for music's origins beyond the human have proliferated over the past decade. Like Changizi, Doolittle and colleagues ask to

48. Savage, "Cultural Evolution of Music," 2.

49. Savage's reference is to an (in)famous essay by Victor Grauer that attempts to substantiate the "out-of-Africa" hypothesis musically. Grauer, "Echoes of Our Forgotten Ancestors."

50. Simplistic notions of genetic inheritance have been thoroughly critiqued; see Müller-Wille and Rheinberger, *Cultural History of Heredity*.

51. Savage and Brown, "Mapping Music."

52. Addressing this desire to account for variation, Banu Subramaniam suggests that methodological and epistemological investments in heredity belie "tortured histories." Underlying ostensibly innocent questions about why difference exists, Subramaniam shows, is a deeper one: Why is variation in need of explanation, when sameness is not? Subramaniam, *Ghost Stories for Darwin*, 7.

53. Mithen, *Singing Neanderthals*, 107.

54. Mithen, *Singing Neanderthals*, 161.

55. Mithen, *Singing Neanderthals*, 167.

56. Rudge, "Hidden Likeness."

what extent "principles underlying the structure of human musical scales derive from biological aspects of auditory perception." They argue that the "songs of nonhuman animals, such as birds or whales, potentially offer a valuable perspective," as

> on the one hand, features of human music that are culturally bound, or dependent on specific characteristics of the human voice or auditory system, should be absent in animal vocalizations. On the other hand, aspects of human music observed in the vocalizations of other species seem likely to be partially determined by general physical or biological constraints rather than solely by cultural practices.[57]

Any shared features (such as the ones they inevitably end up finding) between humans and bird vocalizations are therefore said to indicate that common "constraints" shape human and bird songs.[58] While the epistemological investment in "sounds like" remains in place, Darwin's values are reversed: nonhuman species offer a valuable perspective because of the audible analogies they might elucidate. But basing an argument around analogies demonstrates that there is always something morally invested in the state of being closer to nature, whatever the valence of the arguments being derived. Doolittle, Changizi, and others' arguments thus adhere to Daston's concept of the "naturalistic fallacy":[59] musicality is validated by its natural origins in nonhuman sounds. While these authors purport to show a link between humans and nonhumans, they at the same time therefore construct a striking ontological divide between them due to a singular logic of what musicality is: a biological capacity. A striking example is Doolittle's argument that because Hermit thrushes use simple integer ratios and follow the harmonic series, like much human music,[60] human musical predispositions are "biologically driven."[61] Music is not nurture (culture) but biological "nature."[62]

The biologization of the capacity for music has also led to deliberate abuse in the name of science. Rachel Mundy has documented how attempts by prominent nineteenth- and twentieth-century physiologists to understand animal musics were reliant on violent practices of vivisection and the use of sound spectrograms created from the vibrations of the bodies of dying animals.[63] Spectrograms are still frequently used to map animal vocalizations in the scientific and musicological literature today.[64] And more troublingly, some describe the "great importance" of "invasive" studies on animals

57. Doolittle et al., "Overtone-Based Pitch Selection," 16616.

58. Doolittle et al., "Overtone-Based Pitch Selection," 16616.

59. Daston, *Against Nature*.

60. The social and political implications of the fact that European tonality (the system of music theory behind Western classical music) is based on the ostensibly "natural" overtone series has been debated for centuries. Taylor, *Beyond Exoticism*; James, *Conjectural Body*.

61. Doolittle et al., "Overtone-Based Pitch Selection," 16616.

62. Gray et al., "Music of Nature."

63. Mundy, *Animal Musicalities*, 5.

64. Krause, *Great Animal Orchestra*.

in vivo to understand "the integrated processes by which humans perceive, memorize, and compare auditory input to then guide vocal motor production."[65] Historian D. Graham Burnett has similarly documented the many abuses in the name of science that were conducted on the bodies of cetaceans, often focused around their acoustic capacities. In the nineteenth century whales were thought to be the missing link tying mammals to their reptilian forebears, precipitating experiments that involved dissecting the heads of live whales to uncover how they sensed.[66] This inquiry took on a new urgency in the mid-twentieth century due to interest by the United States Navy in capitalizing upon dolphins' unique capacities for underwater echolocation, again leading to experiments on the brains of live animals.[67]

Yet in the 1960s cetaceans became "symbolic organisms," icons of "man's rapacious carelessness, bellwethers of ecological collapse, rallying devices for social and economic and cultural change and heralded as 'intelligent' with minds 'like' our own."[68] It was thus hoped by counterculture scientists such as John Lilly that communicating with dolphins might be a way to find human redemption. He injected them with LSD in his Miami research center, in which many dolphins died.[69] These legacies of looking for likenesses and differences between humans and cetaceans and the consequent enrollment of cetaceans in human projects of redemption did not end with the close of the twentieth century. Linguist and bio-acoustician Julien Meyer has published research that, citing Lilly's search for human semantics in dolphin clicks, seeks to uncover shared models between human whistled speech and dolphin whistles.[70] Meyer believes that this should have insights for language evolution, providing a "glimpse of how our ancestors communicated before they had fully evolved into humans."[71] The presence or absence of a presumed biological musicality has thus long been a way at once to define species essences and render those entities deemed natural or closer to nature into consumable resources ripe for material or epistemological extraction in the name of human redemption.

The Species of Musicality

What, then, would it mean if all beings were considered to possess musicality? This is a framework to which zoomusicological scholars such as Dario Martinelli often aspire.[72] And yet, we find that such attempts to forge radical (musical) sameness attenuate the

65. Lattenkamp and Vernes, "Vocal Learning."

66. Burnett, *Sounding of the Whale*, 219, 221.

67. Burnett, *Sounding of the Whale*, 180, 225, 247; Ritts and Shiga, "Military Cetology."

68. Burnett, *Sounding of the Whale*, 529–30.

69. Lilly was also involved with Cold War scientists of mind and behavior who also used LSD as an instrument for reducing the inhibitions of suspects. Burnett, *Sounding of the Whale*, 616–17.

70. Meyer, Magnasco, and Reiss, "Relevance of Human Whistled Languages."

71. Spinney, "Could Whistling Shed Light."

72. Martinelli, "How Musical Is a Whale?"; Martinelli, *Of Birds*.

politics of the project, unwittingly reproducing the same hierarchies that defining the existence or the lack of musicality once did. We now dig deeper into which species (or kinds) of musicality are being presumed when an entity or person is said to possess "musicality." How has the species of musicality an organism possesses been used to define that species' worth, and what understandings of what musicality is does this reveal?

Demonstrating a distinct view on what constitutes music and musicality, Hoeschele and colleagues suggest that "the capacity that makes it possible for us to perceive, appreciate, and produce music" can be found by searching for comparative "components of musicality in other species."[73] Synthesizing a wide variety of experiments, where pigeons were trained to go to the left while hearing Bach and to the right while hearing Stravinsky, where carp were identified as being able to distinguish between genres, or where sea bream showed physiological differences after prolonged exposure to music, they ask, "How can we interpret the fact that distinctly related animal species have human-like boundaries for the categorization of such complex auditory stimuli?"[74] If the musicality conventionally assumed to be the consummate marker of human exceptionalism is in fact present throughout the living world, then "examining closely related and distantly related species can be quite useful for probing the biological basis of musicality."[75] Drawing on other studies, they argue that "this could lead to an insight on the origins of our motivation for music."[76] The capacity to identify Bach and Stravinsky or to distinguish between classical genres is here used to define the species of "musicality."

One axis of musicality often examined in nonhuman species is the capacity for inventiveness, often seen as the opposite of biological functionality. It is thought this might differentiate true musicality from instinct. Hollis Taylor, for example, suggests that "inventiveness in [bird]song could surpass biological necessity."[77] To disprove the assumption that "birdsong is hard-wired, innate, ready-made, automatic," and hence not musical, she argues that the value of birdsong lies in how it is irreducible to instinct.[78] She contrasts this to other animal species: "Our closest primate relatives, for example, are not vocal learners. Even the elaborate song bouts of gibbons are innate."[79] David Rothenberg, also writing on the musicality of birdsong, agrees: "Although gibbons sing elaborate duets in their trees at dawn, they are born with this ability, they do not learn it. Birds and humans share the ability to learn to sing, something no ape can do."[80] Gibbons,

73. Hoeschele et al., "Searching for the Origins," 149.

74. Hoeschele et al., "Searching for the Origins," 149–50.

75. Hoeschele et al., "Searching for the Origins," 151.

76. Hoeschele et al., "Searching for the Origins," 162; Rothenberg et al., "Investigation of Musicality in Birdsong."

77. Taylor, *Is Birdsong Music?*, 26.

78. Taylor, *Is Birdsong Music?*, 212.

79. Taylor, *Is Birdsong Music?*, 212.

80. Rothenberg, *Why Birds Sing*, 146.

birds, and humans are all considered to possess musicality, but some forms of life are thought to possess a higher kind of musicality than others, one that remains defined by its comparability to human musical abilities. As was made clear in our earlier discussions of Darwin, Spencer, and Lloyd Morgan, similar questions around the kind of musicality an entity possessed have been central to understandings of value throughout history. Music that was purely instinctual and imitative, as it was claimed were the musics of racialized peoples and animals, was not considered a valid kind of musicality as it did not demonstrate a form of transcendent intellectual culture.[81] Though the details of the debate have changed, the kind of musicality an entity possesses (Functional or transcendent? Imitative or creative? Biological or cultural?) is still often used to make an argument about its relative value and indeed whether it counts as true musicality at all.

In all these cases understanding music in terms of its functionality is central. Mithen argues that we can only understand music's "point" if we look at "how it has been encoded into the human genome during the evolutionary history of our species."[82] And Thomas Geissmann's evolutionary study of the relationship between gibbon songs and human music makes the link between functionality (defined in terms of biological species reproduction) and "musicality" explicit. He argues that musical behavior's use, here gibbon duetting, is found in how it "strengthens the pair bond."[83] Because of this he finds that "in all singing primates, males and females both sing, and in most singing primates, duet singing occurs."[84] Not only this but "it is interesting to note that all primate species that are known to sing are also thought to have a monogamous social structure. . . . This suggests that the evolution of singing behaviour in general are somehow related to the evolution of monogamy."[85] Thus "it makes sense to assume" that "loud calls of early hominids may have been the substrate from which human singing, and ultimately music, evolved."[86] Further, "it is tempting to assume" that this singing of "early hominids shared a lot of properties with the loud calls of modern Old World monkeys and especially apes."[87] Singing here has a "fitness advantage," creating well-coordinated groups (of monogamous pairs).[88] It is not difficult to hear the heteronormative, moralizing undertones: groups of like beings, defined by their coordinated (similarly

81. George Lewis, for example, notes how this aesthetic value (the fetishization of untethered freedom) provided justifications for the disparagement of jazz musicians working in an African American idiom by white avant-garde composers like John Cage. Lewis, "Improvised Music after 1950." See also Clark, "So Nicely in Harmony."

82. Mithen, *Singing Neanderthals*, 1.

83. Geissmann, "Gibbon Songs," 105.

84. Geissmann, "Gibbon Songs," 105.

85. Geissmann, "Gibbon Songs," 112.

86. Geissmann, "Gibbon Songs," 118.

87. Geissmann, "Gibbon Songs," 118.

88. Geissmann, "Gibbon Songs," 119.

biological) musics, gain greater "fitness" through using song in fostering strong, monogamous pairs.[89]

In a clear echo of Darwin, music is only of interest due to its role as a mechanism of sexual selection between heterosexual reproducing monogamous pairs. Steven Pinker, although he suggests the very opposite in his argument for understanding music as evolutionarily functionless, essentially mobilizes the same logic in his notorious characterization of music as "auditory cheesecake."[90] Whether music is considered useful, instinctual, transcendent, or none of these, each of these authors is enfolding the acoustic into the already conjoined logics of economics and evolution[91] to define what musicality is and who is worthy of it. Whether valuing it for its transcendence or rendering it useless because of its transcendence, the question of biological productivity remains inextricably fused, if hidden, within such definitions of a more-than-human musicality. Over twenty years ago ethnomusicologist Elizabeth Tolbert deconstructed this myth: "The 'music' invoked in most contemporary evolutionary theories is precisely . . . a music either coincident with or defined in reference to Western classical music dating from roughly 1750–1900, as practiced and understood in largely Euro-American contexts at the turn of the twenty-first century."[92] In other words, the universalism espoused by many zoomusicologists relies upon a distinct *species* of music assumed to be the baseline of "musicality."

Consequently, implicit in any (assumed) universal musicality is the condition of exclusion.[93] The general zoomusicological justification for attending to nonhuman musical subjects *as musical subjects* is still fundamentally relative, despite claims to the contrary; birdsong or whale song is a worthy object of investigation precisely because others' songs, such as gibbons', are not. And taking songbirds, with their scientifically demonstrated capacities for inventiveness, creativity, uniqueness, and improvisation, to be exemplary models of posthuman musical subjects reproduces a distinctly Eurocentric epistemology of music, an exceptionalism that privileges complexity and capacity to transcend the mundane world of biological needs. In turn, this is a capacity that is attributed solely to certain groups of people.

"We are overdue for a rethink of our similarities and differences with animals," writes Taylor: we must "be open to the possibility of creativity and agency in animals."[94] While this is true, as we have shown, listening for that form of "creativity and agency" can sound suspiciously like the criteria historically used to differentiate humanity from

89. For a deconstruction of this notion, see Willey, *Undoing Monogamy*.

90. Pinker, *How the Mind Works*.

91. Graeber, "What's the Point"; Murphy, *Economization of Life*.

92. Tolbert, "Enigma of Music," 452. We must emphasize that this essay was published prior to the proliferation of zoomusicological scholarship that began with the publication of Martinelli's PhD thesis, "How Musical Is a Whale?"

93. Yamin, "Listening to Gibbons in the Anthropocene."

94. Taylor, *Is Birdsong Music?*, 270.

the rest of the biological world and justify its supremacy. Not only does such a formulation valorize a particular form of musicality as superlative, but in taking for granted humanity as homogenous, musicking subject it perpetuates the notion of what Bruno Latour calls "the *Anthropos* of the Anthropocene, . . . nothing but the fiction of a universalized agent capable of acting like a single humanity."[95] Rather than uniting species in an ecological harmony, the presence of differentially evaluated or unquestioningly evaluated forms of musicality serves to divide the more-than-human world into hierarchies of value and functionality—into once again familiarly distinct species of musicality.

Our Provocation

> Nature does not tell us what *ought* to be from what is. It can feed our imaginations but not compel our actions.
> —Vinciane Despret, *What Would Animals Say If We Asked the Right Questions?*

By now we have examined a range of approaches through which the basic concepts of "musicality" and "species" have been mobilized alongside one another, both in scientific and ethnomusicological publications as well as in popular narratives. We have heard how these have been conducted in the context of anxieties over knowing one's place in a changing world—and have offered the conclusion that the results and arguments tell us more about the cultural and historical positionality of the author than the veracity of their conclusions. We therefore read commitments such as Changizi's to sound as a marker of evolutionary change, with and against scholarship concerned with sound as marker of planetary change, to make clear how the former is and has always been inflected with the values of the latter. While fears of environmental collapse are of course real (and justified), we find that the anxious semiotics of the Anthropocene as indicative of a fear not simply regarding the reality of environmental change but more specifically over the unsettling/disruption of naturalized social and biological hierarchies through which particular groups of people have derived power and privilege.

For past and present theorists, we have shown how the concept of origins gains salience at two different epistemological and methodological scales. First, the progressive development away from pure origins afforded the possibility of social or biological evolution. Second, their focus on imitation demonstrates the centrality of identifying what animals and people sounded like to classify them in terms of whether they possessed musicality and hence to inform these arguments. Musical and species hierarchies were linked through how they were used to create narratives of pure origins and stable baselines. Perceived closeness to natural or animal origins has long been used to denigrate racialized peoples.[96] In the Anthropocene it has also become a way to romanticize certain human groups and particular species: those for whom an audible likeness

95. Latour, *Facing Gaia*, 246.
96. Wynter, "Unsettling the Coloniality," 310.

between music and nature can be found. However, while proposing to heal divides between the human and nonhuman worlds, this effort deploys precisely those value structures used to justify violent and traumatic projects of human and Western supremacy in a misguided (if sometimes well-intentioned) attempt to remedy them.[97] They leave normalized categories of the rational human in place while ensuring that any who fall outside of its perceived and biologically determined normality in place are discursively imprisoned.[98]

Thus even as the work of identifying the origins of musical in the natural is mobilized in a search for repair and human redemption in the light of crises (World War II, the Cold War, early environmental concerns, the crisis of the Anthropocene), deafeningly silent are the troubled politics and histories of the epistemologies that underly such projects.[99] In John Lilly's proclamation that "probably that which would excite the most respect for the human species in a sperm whale would be a full symphony orchestra playing a symphony,"[100] we hear little more than Donna Haraway's characterization of a famous advertisement featuring Jane Goodall's hand grasped by a chimpanzee's: "gestures . . . that absolve the reader . . . of unspoken transgressions, that relieve anxieties of separation and solitary isolation on a threatened planet and for a culture threatened by the consequences of its own history."[101] And when Martinelli calls for "the time when studies of the musical culture of . . . wolves are as common . . . as are studies of Beethoven's 5th Symphony,"[102] questions may be asked, therefore, about what the effects of such a search for radical sameness might be and the histories it may mask.

These are histories in which animal classifications have been used to classify humans on an evolutionary scale of development and to justify horrific violence in the name of societal improvement and redemption. Questions of species origins, particularly when it comes to musicality, are never neutral. And as has been widely demonstrated by scholars from a variety of disciplines, this question of pure origins is deeply political: it is used to challenge the very existence and rights of groups of people; to exclude people from land; to mark certain groups out as inferior; to locate Black and Indigenous people and people of color on a lower rung of aesthetic, intellectual, and/or biological development; or to mark or exclude group memberships.[103] Debates about which species—and by implication which people—are musical were and are quite clearly morally and politically embedded, as they are always debates about "the principles that should guide objective inquiry into the human-animal border."[104] As Nina Sun Eidsheim

97. Lavi, Rudge, and Warren, "Rewild Your Inner Hunter-Gatherer."

98. Wynter, "Unsettling the Coloniality," 310.

99. Wynter, "Unsettling the Coloniality."

100. Quoted in Burnett, *Sounding of the Whale*, 624.

101. Haraway, *Primate Visions*, 156.

102. Martinelli, *Of Birds*, 218.

103. Tallbear, *Native American DNA*; Ingold, "Beyond Biology and Culture"; Bonneuil, "Pure Lines as Industrial Simulacra."

104. Radick, *Simian Tongue*, 4–5.

puts it in her critique of "acousmatic" attempts to gain information by evaluating sounds according to their presumed origins, "What I have realized . . . is that posing the acousmatic question—*Who is this?*—will never tell you who the singer is. Attending to the acousmatic question tells you only who is listening."[105]

Lurking within narratives of environmental redemption through musical listening are examples of what Banu Subramaniam calls "eugenic scripts": the presence of Darwin's ghost in seemingly unexpected places.[106] Attending to the distinctly auditory expressions of these scripts—what we hear as "eugenic echoes"—makes clear how what results from these "sounds like" approaches is not necessarily truer and/or more accurate knowledge of evolution's phylogenetic or genealogical relationships. Rather, explorations of "sounds like," like Changizi's, have provided the basis for multiple forms of physical and epistemological violence, made audible in attempts to aurally compare the sounds of various beings. The claim of "sounds like" more accurately reflects of culturally situated understandings that are better understood as symptoms of Anthropocene devastation than as antidotes to it. Even when they are well intentioned, the auditory processes underpinning estimations of "sounds like" can be expressions of the extractive, consumptive settler-colonial listening practice Dylan Robinson calls "hungry listening." Such listening "satiates through familiarity (to feel pleasure from the satisfaction of identification and recognition) but also through certainty (to feel pleasure from finding the 'fit' of content within a predetermined framework)."[107] How might we avoid attempts to satiate this epistemological hunger?

Listening to Becomings

By thinking species through musicality and musicality through species, we have sought to denaturalize both by emphasizing the peculiar way in which these concepts are used to reinforce each other's facticity. As we have seen, the enactment of species relationships is predicated upon the objective existence of a capacity called musicality, and a more-than-human comparative musicology is predicated upon the prior existence of species categories. These two concepts have been mobilized in tandem to differentially position various groups in hierarchies of value and legitimacy based on their perceived level of musicality. These comparisons revolve around a single axis: likeness and difference. Thinking musicality through species and species through musicality leaves us only the space to ask questions based around who or what is different to who or what, and around who or what is like who or what. But this is dangerously narrow. When musicality is invoked as a way to define the value of a species, and in turn when that species and its value are defined by its musicality, the troubling histories of discrimination that have been justified through biological essentialism continue to resound.

105. Eidsheim, *Sensing Sound*, 24.
106. Subramaniam, *Ghost Stories for Darwin*.
107. Robinson, *Hungry Listening*, 50–51.

Although Steven Feld's notion of acoustemology has enjoyed widespread acceptance, we find a particularly underrecognized element of his formulation germane to our argument.[108] Recently Feld has suggested a definition of acoustemology not derived from the etymological combination of "acoustics + epistemology" but rather as "listening to histories of listening." Acoustemology's promise, in this manner, is its recognition of the (nonneutral) consequences of such inescapable listening histories, "relational and contingent, situational and reflexive."[109] Our issue with "sounds like" and its attendant epistemology of origins-listening is that it is profoundly an-acoustemological: it mistakes nature for culture, politics for inheritance, bugs for features, the "*explanandum* [for] *explans*,"[110] "affinity [for] identity,"[111] and more. When listening for redemption by locating cross-species sonic similarities, or when *musiking* for redemption by, for example, duetting with whales,[112] attenuated are the violent histories of material and epistemological oppression and consumption that made possible these more contemporary forms of listening and sounding.

An acoustemological approach not only tunes into these often-silent genealogies but also offers a model of genealogy that rejects the causality of heredity itself assumed by research into the evolutionary basis of musicality, in which intergenerational similarities/retentions are very real and fixed. Instead it attends to the distinctly sonic politics of becoming through which, as Sarah Franklin writes, the "genealogical describes the power to define and shape origins, or to organize generativity and vitality."[113] To return to the quotation from Eidsheim that serves as the epigraph of our first main section,[114] we find that the values reinforced by a practice of what we have referred to as *origins-based listening* are at best historically and politically ill informed and at worst reflective of biological essentialism and implicit, epistemological structures that have been used to create species and human hierarchies. Thus when certain people or certain other-than-human beings were and are marked out as musical persons while others are reduced to nonmusical animal status, this provokes the need for an alternative. A way of accounting for the concepts of musicality and species that does not rely upon an epistemology of origins-listening is urgently needed.

Following Feld and Franklin, we propose to redirect attention away from a species or musical practice's source and toward what it is in the process of becoming. The malleability of species as a concept has long been addressed in STS scholarship, from Lowe's study of the politics of primate taxonomy in Indonesia to Emily Yates-Doerr's argument that "the power of multispecies scholarship" lies "in its challenge to conventional

108. Feld, "On Post-ethnomusicology Alternatives."
109. Feld, "On Post-ethnomusicology Alternatives," 86.
110. Latour, *Reassembling the Social*, 100.
111. Haraway, "Manifesto for Cyborgs," 73.
112. Rothenberg, "Whale Music."
113. Franklin, *Dolly Mixtures*, 134.
114. The epigraph is taken from Eidsheim, *Sensing Sound*, 6.

taxonomic formulations of classification and belonging."[115] In her discussion of dog pedigrees Haraway also emphasizes the gerundive, active character of the term "species": "Not a fixed thing, but a living, imaginative hope and memory."[116] Yet the concept of musicality retains much of its natural power.[117] How are musicalities brought into being? we might newly ask.[118] Indeed, as Kirksey argues, species "are enacted . . . they are *performed* in specific ways."[119] Rather than accepting the existence of the sort of simultaneously musical and biological blueprint that Estonian biologist Jakob von Uexküll famously termed the "score of nature,"[120] we propose to consider musicality and species both in process, not defined by an origin to which they must constantly return to gain validity but instead the situated context of their performance. This is not to say either concept should be abandoned: both are categories that matter.[121] Not least, and thinking beyond issues of representation, because they are both structural categories that inflict real effects on bodies.[122] But we must recognize that especially in the sense of bounded, taxonomic structures they are both Western concepts, dripping with entitlement.[123]

Hearing species and music/musicalities not as predetermined categories but as processes makes audible their situated becomings and gestures toward a way of addressing such change that can account for the fact that even the demonstrable presence of "sounds like" might itself be the outcome of a process of mediation or intervention rather than an uninterrupted reproduction of the same. If musicalities, like species, are brought into being and sustained by specific naturalcultural processes, in what contexts do things become musical? How is this musicality created? How is it perceived? Asking such questions anew could direct our awareness to the legacies of this term and to how musics themselves are shaped by how they are made to conform or not to preconceived notions of musicality. At stake is hearing the sonic differences between various species and entities not as indicators of differences of degree rather than kind, *pace* Darwin, but rather understanding that such attempts to "render evolution audible"[124] only indicate a very different auditory genealogy: that of the listener. Such a listening would be a

115. Lowe, *Wild Profusion*; Yates-Doerr, "Does Meat Come from Animals?," 309.

116. Haraway, *When Species Meet*, 148; Despret, *What Would Animals Say*.

117. Indeed, despite the rampant scholarly hand-wringing regarding music's definition in the light of a planet's worth of ethnographic data, the concern lies with the difficulty of defining music rather than recognizing the situated politics of generating a definition. In other words, this (ethno)musicological debate is an intellectual generation behind STS scholars who have long recognized the "tropic quality of all knowledge claims." Haraway, *Modest_Witness@Second_Millennium*, 142.

118. For example, Chie Sakakibara shows how for Iñupiaq the whale is neither the origin of human music nor to be used for human salvation but is itself the agent of music. Sakakibara, "'No Whale, No Music.'"

119. Kirksey, "Species," 759.

120. Uexküll, *Foray into the Worlds*, 186.

121. "Abandoning the notion of species," as Kirksey concludes, "would mean losing a useful tool for grappling with other animate beings." Kirksey, "Species," 777.

122. Mbembe, *On the Postcolony*, 7–8; Yamin, "Listening to Gibbons in the Anthropocene."

123. Lowe, *Wild Profusion*.

124. Ames, "Sound of Evolution," 299.

practice not of origins-listening but instead of hearing how taken-for-granted concepts can never contain the world's diverse lived experiences and negotiations of musicality.

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