Abstract

This article explores how sound studies, an interdisciplinary field that draws upon the social sciences and the humanities in researching a broad array of topics related to sound and music, holds promise for music education research. Defining the field using recent sources, it discusses the varied disciplines that contribute to sound studies. Key texts are reviewed, with a focus on methodological models and conclusions of importance to music educators. Three questions concerning the value and importance of establishing connections between sound studies and music education are addresses: First, in what ways can music educators benefit by engaging with sound studies? Second, in what ways can sound studies benefit by embracing music educators? Third, what might music educators contribute to sound studies? After detailing some of the emerging efforts to reconnect music education with sound studies, the article proposes ways that music education and sound studies together might enhance educational practice.
Sound Studies and Music Education

Eisner notes that, “The kinds of nets we know how to weave determine the kinds of nets we cast. These nets, in turn, determine the kinds of fish we catch.”¹ Sound studies is a recently emerged interdisciplinary field that draws upon the social sciences and humanities for a broad range of inquiry into music and sound. Weaving new approaches that cast interesting questions yielding fascinating catches, sound studies has much to offer those looking to expand or challenge their conceptions of music and sound, or educators who wish to hear the world anew while helping others to grow meaningfully with music. This article presents an overview of the field with particular attention to those actual and possible connections to the field of music education.

Sound studies gradually coalesced as a field over the past fifteen years.² Altman’s essay, “Sound Studies: A Field Whose Time has Come” is perhaps the earliest mention of the field by that name.³ That year also yielded Sterne’s dissertation, which was reworked into a key text for sound studies, The Audible Past: Cultural Origins of Sound Reproduction.⁴ By 2004, a special issue of the journal Social Studies of Science was devoted to the field, although the still-tentative nature is captured in a book review title, “Is There a Field Called Sound Culture Studies? And Does It Matter?”⁵

Sound studies is now firmly established as a full-fledged field. Leading institutions of higher education have created interest groups and study centers.⁶ The European Sound Studies Association⁷ serves as a clearinghouse for the increasing scholarly opportunities, including conferences. Sounding Out! is both a blog and a Twitter account that track activity in the field.⁸ And 2012 saw the publication of both a sound studies handbook and a reader.⁹

Defining Sound Studies

The field of sound studies is defined broadly. Pinch and Bijsterveld characterize it as, “an emerging interdisciplinary area that studies the material production and consumption of music, sound, noise, and silence and how these have changed throughout history and within different societies.”¹⁰ Sterne provides a similar definition:

Sound studies is a name for the interdisciplinary ferment in the human sciences that takes sound as its analytical point of departure or arrival. By analyzing both sonic practices and the discourses and institutions that describe them, it redescribes what sound does in the human world, and what humans do in the sonic world.¹¹

These definitions allow a breadth of scholarship that is evoked by a list of disciplines that have contributed in recent years: “acoustic ecology, sound and soundscape design, anthropology of the senses, history of everyday life, environmental history, cultural geography, urban studies, auditory culture, art studies, musicology, ethnomusicology, literary studies, and STS [science and technology studies].”¹² Notably absent from this list is music education—an opportunity to which this article will return.

Key Readings in Sound Studies

A working sense of sound studies as a field comes not from definitions, but through an overview of emblematic and central texts. To provide a richer sense of the field and aid music educators who are curious to begin reading within it, this article first presents seven books that are of central importance, and then briefly describes fifteen additional exemplary works of interest to music educators.
A handbook, a reader, and a journal’s special issue.

Three edited collections provide an introduction to the breadth of scholarship in sound studies. Those working in libraries with institutional access to journals might find helpful the special issue of Social Studies of Science. This issue presents papers from a 2003 conference at the University of Maastricht. Bijsterveld and Schulp provide, for instance, a compelling study of the reasons that classical musicians are highly resistant to technological advances in instrument construction, even innovations that increase efficiency or help the instruments more easily play in tune.

The Oxford Handbook of Sound Studies functions like a longer and updated version of the special issue, based on papers from a conference on sound studies held at Maastricht in 2009. This volume covers new developments and recent projects by many of the writers central to the field, with chapters on such diverse areas as underwater music, ornithology field recordings, ear plugs, digital games, turntablism, iPod culture, and sonification.

The Sound Studies Reader, by contrast, presents foundational readings in sound studies, including many works that predate but inform the work in the field. Several readings excerpt books or longer articles, and Sterne provides ample continuity via an introduction, along with a brief overview for each of its six major sections.

The origins of sound recording and the long history of the MP3 format.

Jonathan Sterne is likely the most prominent author in sound studies. In addition to producing the aforementioned reader, he has authored numerous articles, as well as two deeply original books: The Audible Past: Cultural Origins of Sound Reproduction, and MP3: The Meaning of a Format. Together, these two books provide a broad overview of two epochal changes: the introduction of sound recording technologies on the cusp of the 20th century, and the introduction of digital audio on the cusp of the 21st century.

Sterne’s approach draws heavily on historiography and cultural studies. Rather than discussing the invention of technologies in isolation, stories such as the inventions of Bell or Edison that he critiques based on the “male birth model” of technological development, The Audible Past locates the emergence of sound reproduction within a network of efforts: This history includes the evolving understanding of the ear as established through medical research, efforts to create technologies that would ameliorate or cure hearing loss and deafness, scientific advances in the understanding of sound, and technological advances in a variety of fields. Sterne also locates sound reproduction within parallel efforts for preservation across society: the canning of foods, of visual images through photography, and the preservation of bodies through chemical embalming techniques developed during the US Civil War. Seen this way, the ability to record and transmit sound emerges through a complex network of people, practices, institutions, and technologies that shaped wants, needs, values, and practices.

In MP3: The Meaning of a Format, Sterne proceeds in a similar manner, exploring the diverse origins of the MP3, “the most common form in which recorded sound is available today.” Sterne’s account notes that MP3s were successful in part because they were able to compress audio, allowing files to be shared over then-slow dialup modems in the 1990s. The compression schemes used within the MP3 format are traced over one hundred years of research in psychoacoustics that aspired to model human hearing, to establish normative models of hearing, often fueled by research by Bell Labs. As before, a web of advances are traced, from theoretical advances in the 1920s to quantify communication as information to allow for assessment of compression, to the later emergence of the psychoacoustic constructs of masking.
and the theory of *critical bands*, to the needs of an industry that imagined digital communication while failing to realize that peer-to-peer sharing would emerge. Sterne interviews many involved in the process that set MP3 as a standard. He also details those who were involved in the testing of the various compression schemes from which MP3 emerged, including the race, gender, and class biases of those who listened and the musical material that was used to determine the final MP3 standard.  

Taken together, *The Audible Past* and *MP3* offer a broad history of sound reproduction and digital sound. This history moves from the 19th century, when efforts to understand the outer physical mechanisms of hearing culminated in an understanding of the tympanic mechanism of the ear drum, becoming the model for speakers and microphones that reproduced sound. The gramophone, radio, telephone, and a host of other inventions followed and blossomed in the 20th century. In his second book, Sterne details how attention shifted inwards over the 20th century, from the physical aspects of the ear to the psychoacoustic aspects of the mind. He documents the efforts to understand “hearing as such” to create a universal model of how minds hear, what is noticed, and, especially, what aspects of sounds are not missed when absent. These models allowed for advances in compression that made digital audio a reality, opening the world to sound as computable, storable, and sharable in ways we increasingly take for granted yet whose deeper repercussions often remain unheard.

The previous description of Sterne’s work is meant to evoke the overarching themes of his books. Sterne refers to an *Ensoniment*, an acoustic parallel to the Enlightenment from which modernity emerges, noting that, “A series of conjunctures among ideas, institutions, and practices rendered the world audible in new ways and valorized new constructs of hearing and listening.” This modern approach to sound is captured through constructs like *audile technique*, Sterne’s term for professional notions of hearing that built on ways to render sound as objective knowledge—doctors using stethoscopes or telegraph operators listening to their lines.

Sterne’s use of concepts such as *audile technique*, sound fidelity, “hearing as such,” and *perceptual technics* provide music educators and researchers with new conceptual tools to examine educational practices anew. For instance, what role is played by the specific approaches to hearing and listening promoted by music educators in such courses as music appreciation? Attention to the broader network of industry, educators, parents, policymakers, and musicians might allow the field to understand appreciation anew. Or, to provide another possible question that could be explored using Sterne’s approach: How have our conceptions of sound and musical knowledge been constrained by a dependence on sheet music as the medium of musical understanding? What are the implications of the dependence on scores for an objective knowledge of sound, a dependence captured memorably with Nettl’s chapter title, “I can’t say a thing until I’ve seen the score”?  

Considerations of music education using a network approach provide yet another avenue toward theoretically-grounded attempts to develop alternate epistemologies and pedagogic action around more generous conceptions of music. While much work with the history of music education might be undertaken, these efforts might also lead to a better understanding of musicians who exist today outside of conservatories and schools of music in the United States, such as Steven Ellison, about whom Frere-Jones wrote, “His setup is typical of the twenty-first-century musician: a collection of laptops, keyboards, and processing units, none of them large and most of them portable.” Sterne’s work reminds us that understanding the present can be made in part through understanding the past in new ways, hearing the history of music using more than Grout’s textbook.
Ubiquitous listening.

Kassabian’s *Ubiquitous Listening* presents a way of thinking about music found as people work out, shop, read, or clean their homes—what we often call “background” music. Noting that, “we hear more of it per capita than any other music” she asserts that contemporary society has cultivated a new mode of listening practices, which she names *ubiquitous listening*. Troubling the kinds of knowledge typically created around music, she asserts, “Music scholarship across the disciplines is utterly unprepared to think about such practices.” She then proceeds, even more boldly: What I am advocating is a whole new field of music studies, in which we stop thinking about compositional processes, or genre, or industrial factors as the central matters. Those approaches have yielded some very important insights, and no doubt they will continue to do so. But as a trans-disciplinary scholarly community—across music history, music analysis, popular music studies, ethnomusicology, communications, media studies, sociology, anthropology, cultural studies—we have had far too little to say about most of the relationships between most musical events and most people in the industrialized world.

What does Kassabian have to say about ubiquitous listening? Through case studies from video art, Armenian jazz, and Starbucks’ collaboration with the Putamayo world music label, Kassabian argues that ubiquitous listening is one way that we achieve *distributed subjectivity*, a term that captures how music unites those, often strangers, who find themselves together. As with ubiquitous listening, distributed subjectivity has the potential to upend common approaches to understanding music in the broader field of social action, and to challenge our thinking:

I understand distributed subjectivity in this sense as undermining a series of entrenched ideas: our received notions of both the individual and the social, and particularly any notion of the conflict between the two; the centrality of vision in almost all stories of all kinds of subjectivities, and particularly the repression of all the other senses in such discussions; and the notion of each body as a discrete and pre-social entity.

Music educators might benefit tremendously by heeding Kassabian’s ideas with regards to our teaching. Most of the students we teach do listen to much music in the ubiquitous mode, and Kassabian is correct that our field is rarely attentive to this mode of listening—at least not in a positive manner. Most musicians, including educators, regard music in a mall or restaurant with derision or contempt—an enemy of the kinds of attentive listening at the heart of the project of the conservatory. But Kassabian’s point that ubiquitous music constitutes the most common form of musical experience, and her insistence that this listening also produces a canon can inspire us to listen anew and to consider ubiquitous listening and related genres such as Muzak.

What might we hear if, instead of regarding this listening with derision, we regard ubiquitous listening with an open curiosity for its potential to be a resource, something to which we might contribute and from which our students might grow?

How Parisian opera audiences grew quiet.

Johnson’s *Listening in Paris*, a work frequently cited by those in sound studies, is an exemplar of an account of change that draws on a diverse network of influences. Johnson explores how French opera audiences, between 1750 to 1850, shifted their raucous behavior toward quiet focused listening. He discusses the enmeshment of compositional practice, audience expectations, political shifts, and even the arrangement of the performance hall:
The particular developments at the opera and in concerts of the 1770s and 1780s — the fires that forced new floor plans, the growing aesthetic interest that rearranged seating patterns, plots designed to move rather than enchant, a musical revolution that brought more engaged listening, and the greater subjectivity that necessarily followed — gave the musical public its particular personality.33

Today’s musical situation can be considered using a similar approach. Musicians and audiences currently exist within diverse contexts, but a common set of conditions can begin to sketched out and explored: with music often experienced through online circulation, for audiences whose primary experience of sound is in the ubiquitous listening mode, alongside rapidly evolving global music trends, and with all participants connected through networks of shifting technological hardware and software. Our understanding of these changes and the larger context within which music is made and experienced — including not only the positive but also problematic and troublesome aspects — relate directly to our ability to understand and make sense of the kinds of music education young people will most benefit from and appreciate.

Listening to the sounds of concert halls.

That even symphony orchestras are deeply connected to technological change is in evidence throughout Emily Thompson's The Soundscape of Modernity.34 Thompson describes how changes in building materials, emerging scientific theories of acoustics, differing architectural standards, and evolving musical desires and aspirations radically reshaped concert halls and the listening public in the early 20th century. Her work covers the radical developments over a short period of time, from Boston’s Symphony Hall to the construction of Radio City Music Hall.

Thompson’s work allows us to attend to acoustic aspects of spaces in new ways, and to appreciate how aesthetics, engineering, materials sciences, and musical practices co-evolve. As she provocatively writes:

Unremarkable objects like sound ethers and acoustical tiles have as much to say about the ways that people understood their world as do the paintings of Pablo Picasso, the writings of John dos Passos, the music of Igor Stravinsky, and the architecture of Walter Gropius. All are cultural constructions that epitomized an era defined by the shocks and displacements of a society reformulating its very experience of time and space.35

Thompson’s work is easily put into immediate use in music classrooms. Most students perform in a variety of spaces, which teachers can re-describe for their students using ideas from Thompson’s book. By way of example, in classes I teach we discuss two halls on the [redacted for anonymity during the review process] campus that illustrate Thompson’s points. [redacted for anonymity during the review process], built in the 1920s, is the kind of rectangular and reflective hall of wood and plaster that produces a wash of resonance and reverb — an ideal bath of sound for orchestras of that period — ones that made frequent small mistakes and whose intonation was imperfect. By contrast, the [redacted for anonymity during the review process], opened in 1969, reflects the radical changes in musical aspirations and accomplishment, with complex sound diffusion that produces clarity in the initial sound and highly diffuse reverb that warms the sound without obscuring detail. This modern hall is adapted to musicians who have been better trained, also providing greater detail for audiences.

Not coincidentally, the modern hall produces a sound that is closer to orchestral recordings made from mid-century onwards, recordings of detail and clarity made possible using multiple microphones. The halls we build favor particular types of musicians, and we build them out of evolving expectations and aspirations drawn from what we hear, including recordings.
These halls, in turn, reward musicians who know how to perform so as to best connect with the acoustic properties of the hall. Of course, these kinds of first-hand experiences can lead to other discussions of new and notable halls, as well as pique the curiosity of students to think about other spaces, acoustic and digital and hybrid, in terms of the soundscapes they offer and the types of music they support.

**Brief Notes on Additional Works of Interest**

While it is beyond the scope of this article to do more than hint at the full breadth of scholarship in sound studies, there are additional works of particular potential interest and value to music educators. These include a host of publications that address sound recording, and several monographs that deal in depth with a single topic, along with some older texts that are central to those working in sound studies.

Sound recording has attracted extensive attention in recent years, with several outstanding works. Perhaps the most accessible is Katz’s *Capturing Sound: How Technology Changed Music*. This broad overview includes chapters on recordings and jazz, the emergence of violin vibrato as an artifact of the recording process, hip hop music’s use of samples, as well as a chapter exploring early changes that grow from the internet. Stanyck and Piekut write movingly about *deadness*, a quality they locate in all music today that flows from recordings, allowing a perpetual reengagement of the living and the dead. Their primary example is the hit duet between Natalie Cole and her deceased father, about which the authors write, “We might even say that this is the only guarantee that sound recording offers: being recorded means being enrolled in futures (and pasts) that one cannot wholly predict nor control.” In contrast, Auslander discusses *liveness*, examining how complicated the notion of live performance has grown given the enmeshment of performers, amplification, synthesis and sampling, and computerized accompaniment systems. He also touches on the cultural and social aspects, noting for instance that MTVs “Unplugged” series emerged precisely in the wake of the Milli Vanilli lip-synching scandal.

The scholarly monograph is a common form in sound studies, with a number of outstanding examples. Rath’s *How Early America Sounded* provides an historical examination of natural and human-made sounds and their place in the lives of natives, settlers, and slaves in 15th and 16th century America. *Village Bells* explores the relationship that communities in the French countryside had with bells used for communal organization, the announcement of births, and for control of messages by the town and church. *Pink Noises* focuses on interviews with women active in electronic music, a needed corrective for discussions of music and technology that are often gendered in masculine ways. *Analog Days* provides a comprehensive history of the Moog synthesizer, an instrument that, “for a short while in the sixties was not just another musical instrument; it was part of the sixties apparatus for transgression, transcendence, and transformation.” Additionally, the topic of listening has attracted the attention of three philosophers through monographs: the older phenomenology *Listening and Voice*, *Listening*, and *Listen: A History of our Ears*.

A host of earlier authors central for those working in sound studies might be of interest to those in music education. Adorno’s *Current of Music* makes available work he undertook to better understand radio while working in Princeton from 1938–41. Notably, the collection includes his essays on music appreciation efforts, particularly his extensive critique of the NBC Music Appreciation Hour, as well as an additional essay that lays out his interests and desires for music appreciation. Benjamin’s work on media is collected in a new translation, including his
classic essay on the work of art in the age of mechanical reproduction (here translated as technological reproducibility). Many in sound studies reference the ideas of Attali’s explication of the political economy of music remains compelling and inspiring and is frequently cited by those in sound studies. While connections from sound studies to music education are scant, many authors do cite Small and Schafer.

Three Questions Regarding Sound Studies and Music Education

Having presented texts meant to give a sense of sound studies, three questions come to mind: First, can music educators benefit by engaging with sound studies? Second, can sound studies benefit by embracing music educators? Third, what might music educators contribute to sound studies?

This author regards the first question to be largely a settled matter: Music educators can benefit through engagement with sound studies, expanding their sense of the possibilities for what and how they teach by engaging with texts such as those reviewed in this article. Much of the benefit might come from a deepened sense of ways to understand sound and music that go beyond approaches commonly found in music schools, notably that confine their sense of music to music history, music theory, and the psychology of music. Sound studies might help the field to supplement and challenge the common approaches through ideas from the disciplines that constitute sound studies, with ideas based on a broader sense of music and sound.

Can sound studies benefit by embracing music educators? Cavicchi, notes that music education, by ignoring so much of the larger musical world of young people, might rightly be considered by many to be irrelevant. Certainly, few researchers in sound studies currently cite music education research. But to ignore the contributions of music educators is to miss out on the understanding of those who contribute to the musical growth of every person in society via music education programs in compulsory schools. While no educator has a monopoly on the musical imagination of his or her students, good teachers do regularly inspire students to consider the world in new ways. Good ideas need champions to reach the world, and ideas from sound studies are more likely to reach young minds if music educators are connected to them. Finally, educators are well positioned to forge new ways of teaching sound drawn from, just as the composer Schafer drew inspiration from a series of educational outreach programs that helped lead to his notion of the soundscape. Those in sound studies would certainly benefit by forging connections with music educators.

Finally, what might music educators contribute to sound studies? Certainly the citations of Small by those in sound studies demonstrates a willingness to connect with works in music education. While the depth of ideas and richness found in sound studies can be quite humbling, I believe that educators do have significant contributions to make. While most in sound studies hold that technology is socially constructed, it is hard to locate texts that stress learning as part of the process of social construction. Learning is rarely present in rich ways in sound studies, to the detriment of that field. Educators’ inquiries can illuminate how others come to know, and sound studies can benefit through contributions by those who take that learning seriously enough to plan educational research built on some of the fundamental ideas presented by authors in sound studies. Educators working with these concepts are likely to have something to say that those in sound studies might never come to on their own. Perhaps through alternate histories of music education in the 20th century, histories that are more attentive to the place of media and technology but understood through the lens of larger educational movements, music education researchers are in a position to make significant contributions to sound studies.
Contemporary efforts to engage with sound studies by music educators are already apparent. Abramo has contributed a chapter that examines sound studies as it applies to qualitative and arts-based research, as well as an article that focuses on sound studies in relation to listening and epistemology for music education. Armstrong’s book *Technology and the Gendering of Music Education* works within a social construction of technology framework resonant with sound studies, as does a recent chapter on technological determinism in music education. Thibeault explores the relationship between music education and the shifting locus of musical experience, using a sound studies and a Deweyan approach to technology as a theoretical framework. These efforts hold promise for possible contributions that could come by engaging with sound studies.

(Re)commencing Sound Studies And Music Education

To return to the Eisner metaphor that opens this article, the nets woven by those in the field of sound studies produce accounts of the world that those in music education could stand to catch. Sound studies, in providing rich accounts of change, can serve to expand the imaginations and aspirations of those weaving new ideas in music education.

To hazard a generalization about a field as diverse as sound studies as it differs from the even more diverse field of music education: Sound studies often succeeds in gathering together aspects of music that educators typically keep separate. Katz, for instance, discusses jazz improvisation, violin vibrato, sampling, and listening in cyberspace by focusing on the overarching technologies and practices of sound recording. Given how often music education segments inquiry by band, orchestra, and choir, the ability to produce work that allows regard for relationships between disparate areas is exciting. Music educators can look to sound studies for models to weave new kinds of nets to catch the world anew.

The nets woven by researchers in sound studies connect with broader scholarly currents that deserve more attention by those working in music education. These currents, including popular music studies, the new musicology, feminism, queer studies, help to locate music and music education within broader social, cultural, and political contexts. Leading music education philosophers and sociologists often engage with these currents, but these currents remain underrepresented in schools and even many university programs. Sound studies can serve as yet another resource in resolving some of the dilemmas in music education, including how to both honor traditions and the continuity of musical history while critiquing the race, class, and gender biases that too often still exist and plague our field.

Sound studies also often includes technology without focusing on the gadgets. Too often in music education the technological is regarded as outside of the traditional, a resource to use when one wants to embrace the kinds of compositional activities that are hard to squeeze into band, orchestra, and choir classes. The readings from sound studies suggest that we might simply argue instead that everything musicians do is already and inescapably deeply enmeshed with technological change at the societal and cultural level. In this way, we might begin to provide a better accounting of the technological underpinnings of programs that at present are considered to be separate from or opposed to the technological. We might also find more points of connection between those aspects of music considered distinct or oppositional to the kinds of programs commonly found in schools and conservatories. We might broaden our offerings in response to these different understandings, or we may find new rationales to continue offering the types of programs many aspects currently widespread.
Sound studies researchers help in these efforts because they often hold the technological as a broader aspect of society in which all are enmeshed to some degree. This follows Heidegger’s notion that the essence of technology is not merely the technological, but the pattern of living and the way that being (Daesin) manifests itself in the modern world. This stance connects with the notion of the senses as culturally produced, following Marx’s statement that, “The forming of the five senses is a labor of the entire history of the world down to the present.” Adorno, like Marx, saw radical changes in social conditions and productive forces brought about in concert with modernization, writing, “Regardless of how educators might assess such issues as drive structure, sublimation or culture, their work is only of use if their reflections take the real changes that have gone on, both in people and in the power of culture, into account without any illusions.”

Sound studies continues the kinds of inquiry that follow from these broad statements concerning the enmeshment of the senses, the sociocultural situation, and technology, often via Latour’s actor-network-theory.

In offering new nets, new ideas with which to catch the world in new ways, sound studies may yet prove helpful in resolving some of the primary challenges in our field, particularly the call to broaden existing conceptions of music education. Whether vernacular music, community music, informal pedagogy, participatory media culture, democratic music education, or music education as a civil right; a variety of current efforts constitute what is likely the most prominent yearning in our profession today—for more music to reach more students in more ways. These efforts certainly face many obstacles and challenges that make success far from guaranteed—witness the lack of improvisation in school programs today despite the prominent placement in the National Standards two decades ago. As music educators strive to place music back into the larger field of social activity, sound studies provides useful models and conceptual tools that could make these efforts more successful.

This article shares rich ideas from thinkers whose work has coalesced into the field of sound studies, ideas that deserve the attention of those working in music education. The article also presents the argument that working in sound studies would also benefit from contributions by those in music education. In presenting some of the field’s exemplary efforts, it is hoped that educators might find their curiosity piqued enough to connect with the field—both learning from and contributing to sound studies.

2 While the term *sound studies* is currently the most popular for this field, other terms such as *sound culture studies* have been used, and those in musicology often still use Feld’s term *acoustemology* to speak about related approaches to the interdisciplinary study of sound. And, the review’s question is answered in a qualified affirmative with regard to the work of Sterne and Thompson reviewed there. See Steven Feld, “Waterfalls of Song: An Acoustemology of Place Resounding in Bosavi, Papua New Guinea,” in *Senses of Place*, ed. Steven Feld and Keith H. Basso (Santa Fe, NM: School of American Research Press; Distributed by the University of Washington Press, 1996), 91–136.


6 These include informal interest groups for graduate students and faculty, such as the University of Minnesota (https://wiki.umn.edu/MusicAndSoundStudies/), and more formal institutes such as the Sound Studies Lab at the Humboldt-Universität zu Berlin (http://www.soundstudieslab.org) or a recently established lab at Harvard (http://www.fas.harvard.edu/~musicdpt/resources.html).

7 See http://www.soundstudies.eu

8 See http://soundstudiesblog.com and https://twitter.com/soundingoutblog


15 Pinch and Bijsterveld, *The Oxford Handbook of Sound Studies*.

16 Sterne, *The Sound Studies Reader*.


Sterne, *MP3*, 1.

Sterne (2012b) notes several studies that suggest cultural, racial, and gender bias was introduced by the hearing tests that resulted in the MP3 format via tests of ears that were overwhelmingly those of white male middle-class engineers in Europe listening to then-popular music for that group.

*ibid.*, *MP3*, 58.


Ibid., 1.

Ibid., 2.

Ibid., 19.

Ibid., 93–94.


Ibid., 94.


Ibid., 11.


49 In my teaching over the past five years I have increasingly included readings from sound studies across my undergraduate and graduate courses, and consistently find that students respond to the wide-ranging approaches to sound and music in sound studies.


51 Schafer, *The Soundscape*.


