

“Jazz Steel”: An Ethnography of Race, Sound, and Technology in Spaces of Live Performance

Thomas Trask Wetmore

Submitted in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy
under the Executive Committee
of the Graduate School of Arts and Sciences

COLUMBIA UNIVERSITY

2022

© 2022

Thomas Trask Wetmore

All Rights Reserved

Abstract

“Jazz Steel”: An Ethnography of Race, Sound, and Technology in Spaces of Live Performance

Thomas Trask Wetmore

This dissertation uses multi-sited ethnography to explore how the technological manipulation of sound in live jazz performance conditions the meanings, feelings, and politics of racial difference. Situated primarily in two multi-room jazz venues, Jazz at Lincoln Center (JALC) and the Montreux Jazz Festival, I analyze three years of participant observation with musicians, audio technicians, acousticians, and sound system designers. I analyze four main categories of technology: (1) physical acoustics; (2) sound isolation, (3) sound reinforcement (amplification); and (4) digital measurement, prediction, and manipulation technologies. My overarching goal is to provide new ways to understand live performance with more attention to the technologies, architectural designs, and human labor crucial to any sonic event. I show not only how the built physical spaces and technologies I observed are inscribed with human judgments about music and sound, but how the spaces themselves exhibit their own agentive force in conditioning social behavior. I thus rethink live performance as a dynamic network of materials, technologies, and human and nonhuman practices and meanings. My second intervention uses the figure of jazz—and, more specifically, the *sound of jazz*—to investigate how the intersection of technology and sound exposes new ways to think through questions of human difference. Focusing primarily on race, I show how ideals of scientific objectivity and “pure and clean” aesthetics challenge racial tropes of Black sound as “noisy” or disordered while

complicating jazz's political force as an agent of oppositional energy and Black cultural distinctiveness.

Chapter one, “‘Some Rooms Make You Shout’: Physical Acoustics and the Sound of Jazz,” shows how the designers of JALC’s Rose Theater, a prestigious 1,300-seat concert hall, acoustically encoded musical and social values into the physical materials of the room and the building that surrounds it. Namely, I show how particular aspects of the hall’s physical acoustics reveal overlapping investments in western aesthetic values and Afro-diasporic priorities, including call and response, participatory interaction, and heterogenous timbral palettes. Chapter two, “‘Some Rooms Make You Whisper’: The Art of Isolation and the Racial Politics of Quiet,” focuses on Rose Theater’s acoustic isolation, accomplished through a rare and expensive “box-in-box” construction that physically disconnects the hall from any vibratory connection with the outside world. This unique architecture fosters an uncannily quiet, sequestered aural environment that counters a range of histories of racist white listening that associate Blackness, Black bodies, and Black spaces with various forms of “noisy” sonic excess. The hall’s extraordinary quietness also reinforces a culture of attentive listening that enmeshes the sound of jazz with western ontologies of aesthetic musical autonomy. Relatedly, chapter three, “‘Make Yourself Invisible’: Transparency, Fidelity, and the Illusion of Natural Sound,” demonstrates how ideals of fidelity and transparency are embedded within electroacoustic sound systems, and how my interlocutors design and operate such systems to foster a “pure and clean” aural environment. I show how my interlocutors aspire to an illusion of a “natural,” technology-free sonic experience but deploy an array of technological systems to do it. My analysis challenges traditional notions of fidelity—and sonic mediation itself—by revealing musical experience as a constellation of vibrant interactions between acoustic vibrations, amplified sound energy, and physical human

bodies. Chapter four, “Tuning the Room: On the ‘Arts’ and ‘Sciences’ of Sound and Space,” analyzes how my interlocutors design and calibrate sound systems using state-of-the-art digital equipment to foster what they call a neutral, “colorless” sonic environment with “the same sound everywhere.” This process of “tuning the room” conjures novel ontologies of sound and space as objects of detached observation and technoscientific manipulation. In chapter five, “Black Boxes, Pink Noise, and White Listening: Rationalizing Race, Gender and Jazz,” I demonstrate how the objectification of sound and space is entangled with raced and gendered epistemologies of scientific knowledge production. I further analyze these approaches to sound and space for their underlying entanglements with what Lipsitz calls a “white spatial imaginary”: an ostensibly neutral environment conducive to discriminatory systems of capital accumulation. These and other entanglements complicate the oppositional, counter-hegemonic potential of jazz and other forms of Black performance.

Table of Contents

Table of Contents	i
List of Charts, Graphs, Illustrations	v
Acknowledgments.....	vii
Introduction: Jazz Steel.....	1
0.1. The Field and Field Sites	2
0.2. “The Sound of Jazz”: Entering the Field	3
0.3. Back in the US	20
0.4. “Jazz Steel” and “Pure and Clean” Sound	22
0.5. Meyer Sound and “High-Fidelity”	25
0.6. Taking “Things” Seriously	27
0.7. New Materialism and the “Nonhuman Turn”	31
0.8. Jazz, Technoscience, and Race	33
0.9. Jazz History: Blackness, Freedom, and “Irreducible Materiality”	35
0.10. On Colorblindness, Whiteness, and the Arts and Sciences	41
0.11. Chapter Summaries	43
Chapter 1: “Some Rooms Make You Shout”: Race, Acoustics, and the Sound of Jazz	52
1.1. “Jazz Steel”: Matter, Materialism, and Institutions	55
1.2. “The Golden Tail”: Acoustics for the Sound of Jazz.....	60
1.3. “Closing the Gap”: Intimacy, Interaction, and Immediacy	66
1.4. “Who We Are”: The Jazz at Lincoln Center Orchestra in Rose Theater	74
1.4.1. “We’ve Got This Down to a science”	80

1.5. “Too Loud for Lincoln Center”: Marcus Miller’s “Electric Miles”	81
1.5.1. “They’re Having a Freak-out Over How Loud It Is”	88
1.5.2. “Because of the Fears”	90
1.5.3. “Some Rooms Make You Shout, Other Rooms You Whisper”	92
Chapter 2: “Some Rooms Make You Whisper”: The Art of Isolation and the Racial	
Politics of Quiet	101
2.1. “Walls, Largely Unbreachable”: An Ethnographic Entry	102
2.2. “The Great American Noise”: Jazz, Race, and the Politics of Silence	108
2.2.1. “A Low Noise in a Low Dive”: Basements, Clubs, and the Racial Imagination.....	111
2.2.2. “The Outlaw Thing”	114
2.3. “Some Rooms Make You Whisper”: Jazz, the Concert Hall, and (White) Listening	117
2.3.1. Museum Listening and the “Music Itself”	118
2.3.2. “Like a Class”: Rose Theater	119
2.4. Jazz in the Concert Hall: A Sounded History	122
2.4.1. Early Jazz and Swing	123
2.4.2. Ellington, Art, Bebop, and Beyond.....	126
2.5. Conclusion	130
Chapter 3: “Make Yourselves Invisible”: Transparency, Fidelity, and the Illusion of	
Natural Sound	137
3.1. Introduction.....	137
3.2. “Make Yourselves Invisible”: Interrogating Fidelity, Transparency, and “Original”	
Sound	138
3.2.1. “To Capture the World”: Fidelity and the Dream of Natural Sound	142

3.3. “A Blank Canvas”: Transparency and Meyer Sound	146
3.3.1. “The Master”: Bob McCarthy	148
3.3.2. “Same Sound,” Linearity, and the Scientific Approach.....	153
3.3.3. The Disorientation of the “Blank Canvas”	158
3.4. Memory and the Imagined Ideal	164
3.4.1. Imagined/Remembered Acoustic Sound as “Original”	165
3.4.2. “A Little Extra High End”: On Frequency and Flatness.....	168
3.4.3. How Meyer Relates to JALC’s Overlapping Approach	170
3.4.4. “Strong Magic”	173
3.5. Conclusion: Rare Magic	177
Chapter 4: Tuning the Room: On the “Arts” and “Sciences” of Sound and Space	181
4.1. Introduction.....	181
4.2. From Black Magic to Black Boxes: On the Arts and Sciences of Sound.....	185
4.2.1. The Art/Science Line	186
4.2.2. An “X-Ray Machine” for Sound: The SIM Analyzer.....	192
4.3. “The Battle for Spatial Uniformity”: Tuning the Room	198
4.4. Microphones, Machines, and Moving: Tuning as Contested Assemblages	202
4.5. Example 1: The Fills: On Microphones, Machines, and Moving.....	208
4.6. Example 2: “I’m Going to get Phone Calls”: On the Visual, the Aural, and Politics of Aural Knowledge	219
4.6.1. The Narrative	221
4.7. Conclusion	227

Chapter 5: Black Boxes, Pink Noise, and White Listening: Rationalizing Race, Gender and Jazz	231
5.1. Introduction: Very Hard to Hear.....	231
5.2. Part 1: White Aurality, the Listening Ear, and Whiteness as “Universal Listening”	237
5.2.1. Auditory Whiteness as Universal Listening.....	238
5.2.2. “White Aurality” and the “Sound Itself”	241
5.2.3. The Modest Witness and a “Culture of No Sound”	243
5.2.4. Tuning, Transparency, and the Modest Witnesses of Sound.....	245
5.2.5. “The Machine Doesn’t Know”	252
5.3. Part 2: Black Sound, Abstract Space, and the White Spatial Imaginary: Under the Bridge and Above the City	255
5.3.1. Whiteness as Orientation	256
5.3.2. “Under the Bridge”	257
5.3.3. Abstract Space and the Illusion of Transparency.....	260
5.4. Jazz Venues, Transparency, Exchange Value, and Whiteness	261
5.4.1. “They Make Money on Us”: Value Engineering and the Exchange Value of Sound	265
5.5. “To Dance and Sing”: The JALC Contradiction	269
Conclusion	277
References.....	283

List of Charts, Graphs, Illustrations

Figure 0.1: Frederick P. Rose Hall, exterior	7
Figure 0.2: JALC’s central location, as seen from the Appel Room	7
Figure 0.3: Rose Theater during a rehearsal.	10
Figure 0.4: The Appel Room at night	12
Figure 0.5: The author at the piano, Appel Room	13
Figure 1.1: Potential early reflections	61
Figure 1.2: Rose Theater, seating and shape optimized for proximity	68
Figure 1.3: Rose Hall “balcony fronts”	71
Figure 1.4: Rose Theater secondary resonating chamber	72
Figure 1.5: Comparing labor and technology, JLCO v. Marcus Miller	75
Figure 1.6: Front of house mix position, Rose Theater	76
Figure 2.1: Time Warner Center, JALC facility, exterior.....	102
Figure 2.2: Rose Theater on a typical workday	102
Figure 2.3: Rose Theater's “Box-in-Box” construction and its material surroundings	106
Figure 4.1: Meyer Sound’s “art/science line”	187
Figure 4.2: The standard conceptualization of a sound system	189
Figure 4.3: The Meyer Sound concept of a sound system and the art/science line	190
Figure 4.4: SIM over the years	192
Figure 4.5: SIM visual readouts	194
Figure 4.6: SIM measurement of Meyer Sound system	196
Figure 4.7: Transfer function examples	196

Figure 4.8: Typical scenes from room tunings, emphasizing the visual.....	199
Figure 4.9: “Voicing” the system after optimization	201
Figure 4.10: Stravinski Auditorium, plan view.	204
Figure 4.11: Stravinski Auditorium from the front of house mix position.....	204
Figure 4.12: Mauricio Ramirez using SIM interface during tuning of Stravinski Auditorium ..	208
Figure 4.13: OUT fill and IN fill Speakers	210
Figure 4.14: Tuning area.....	212
Figure 4.15: Low-Mid Beam Control	220
Figure 4.16: Magú gathering visual data	223
Figure 4.17: Frequency response and phase traces	224
Figure 5.1: Comparing “live” measurements to saved “traces”	251

Acknowledgments

This dissertation would have been impossible without the effort and generosity of my advisor, Chris Washburne, who tirelessly helped me at every step in the process. I am inexpressibly thankful to the members of my dissertation committee, Ana María Ochoa Gautier, George E. Lewis, Ingrid Monson, and Steven Feld, all of whom provided insightful suggestions and encouragement that will keep me thinking for years to come. In addition to these scholars, the material in this dissertation developed through years of collaboration and friendship with Aaron Fox, Kevin Fellezs, and countless other faculty members and graduate students.

Aaron Fox deserves particular thanks for his gargantuan impact not only on my own graduate career but on the whole mission of studying music and sound at Columbia. His virtuosic institution building and unshakable political intensity have made the Columbia ethnomusicology program the most inspiring place I could imagine developing as a scholar and human being. I doubt I will ever find an environment that so effectively balances scholarly excellence with far more important values like social justice and respect for family. Everyone affiliated with the Columbia Music Department owes Aaron thanks for tirelessly working to decolonize music study—and the academy overall—decades before such a mission was a legible objective.

Additional faculty that have provided guidance and inspiration include Alessandra Ciucci, Seth Cluett, Ellie Hisama, Douglass Repetto, Brad Garton, Magdalena Stern-Baczewska, Susan Boynton, Walter Frisch, and Joseph Dubiel. Outside the academic realm, my warmest gratitude to Ole Mathisen for his warm comradeship on jazz gigs and undergraduate concerts.

I was fortunate to have the most inspiring doctoral cohort I could have imagined, and I thank deeply Andrés García Molina, Mario Cancel-Bigay, and Maria Fantinato for reading

drafts, making fieldwork suggestions, and providing all manner of personal and professional support. Other graduate students that helped get me through these years include Whitney Slaten, Didier Sylvain, Emily Hansell Clark, Kyle Decoste, Jesse Abel Chevan, Kevin Holt, Mark Hannaford, Martii Newland, Nandini Banerjee, Laina Dawes, Ian Sewell, and Jessie Cox. Thanks also to all the students and faculty I worked with during my time as Editor-in-Chief and Assistant Editor of *Current Musicology*, especially Didier Sylvain and Laina Dawes, as well as the many authors who taught me so much, including Will Cheng, Tamara Levitz, Licia Fiol-Matta, Alexandra T. Vazquez, Fred Moten, Gayatri Gopinath, Jack Halberstam, and Lucie Vágnerová.

In the Music Department Office, warmest thanks to Anne Gefell, Beth Pratt, Erica Lockhart, Johanna Lopez, and especially Gabriela Kumar, who helped me out of too many jams to recount here, always with an encouraging smile. Nick Patterson and Elizabeth Davis consistently helped me out of tight spots at the Music Library.

As is made clear throughout these pages, my work would be nothing without the unending stream of generosity provided by my interlocutors and collaborators in the field. At Jazz at Lincoln Center, innumerable doors were opened by the kindness and generosity of John Uhl, David Gibson, and Doug Hosney. Thanks also to Alan Sheehy, Wayne Roelle, David Robinson, Jeff Turner, Michael Givey, Indio Melendez, David Taylor, John Starmer, Billy Banks, Seton Hawkins, and Wynton Marsalis. Thanks also to the “Sound of Jazz” acousticians and sound system designers who shared their insights, especially Damian Doria, Sam Berkow, Chris Darland, Ed Arenius, and Tom Clark. From Meyer Sound and the Montreux Jazz Festival, thanks to John and Helen Meyer, Steve Ellison, Bob McCarthy, John Monitto, Jose Gaudin,

Mauricio Ramirez, Martin Reich, David Tabachnik, Merlijn Van Veen, Michael Brown, Roger Harpum, Brian Svoda, Jane Eagleson, and Dave Bigg.

Most important to this project, and to my life overall, has been the support and love of my family. Thanks to my parents Tom Wetmore IV and Luann Grenda Wetmore, who gave me the incredible gift of drive to succeed while supporting every decision I've made along the way, inspiring me to believe I could do anything I wanted without pressuring me to follow anyone else's footsteps. Thanks also to my in-laws, Jose Otavio Magno Pires and Ana Ligia Pires, who have supported me as a son with constant encouragement and love, as well as my sisters, Anna and Marie, and my siblings-in-law Marcos, Kristina, Roberta, Stephen, Jeff, and Ted.

Lastly, my deepest gratitude goes to my wife and my rock, Maíra, whose unfailing love and unconditional support makes everything possible, and to my children, Georgie and Julie, who shine so bright and love so deeply I can hardly breathe. You are my everything—my music, my passion. My world reveals itself through you, and every moment you make it more beautiful.

Always and forever, I dedicate this work, like everything I do,

to my angels, my inspirations, my true loves—

Maíra, Georgie, and Julie

—with the deepest gratitude to my parents.

Introduction: Jazz Steel

This is a study of *how jazz sounds*. More specifically, it interrogates how jazz sounds in particular physical spaces—which is to say, in particular *rooms*. While I build on ethnographic work at a variety of venues, I report mostly on performance spaces at Jazz at Lincoln Center in New York City and, to a lesser extent, the Montreux Jazz Festival in Montreux, Switzerland. I analyze these rooms for their particular architectural characteristics, deployments of electroacoustic technology, modes of operation, and types of performance that proceed within them. I argue for the capacity of these physical spaces and technological systems to condition sound, orient human (and nonhuman) behavior, and encode, conjure, and contest various modes of knowledge and feeling. Most basically, I ask: how does jazz sound in these rooms, how did it come to sound this way, and what does it *mean*?

I address these questions through ethnographic investigation of the technologies, methodologies, and epistemological commitments of the men (mostly) and women (rare exceptions) that design these rooms and engage with the technologies distributed through them. I describe and scrutinize how jazz rooms are conceptualized, designed, and built, and how layers of aesthetic, ideological, and epistemological commitments are recruited into making these spaces sound the way(s) they do.

I analyze four main categories of technology: (1) physical acoustics (chapter 1); (2) sound isolation (chapter 2), (3) electroacoustic sound reinforcement (chapters 3 and 4), and (4) digital tools for designing, measuring, analyzing, and “tuning” high-end sound systems (chapters 4 and 5). All of these, I argue, play an indispensable role in the cultural meaning, affective experience, and political force of jazz and other modes of sounding that take place in the rooms discussed in these pages.

This dissertation has three overlapping aims. My first and most overarching goal is to provide new ways to understand live performance with more attention to the technologies, architectural designs, and labor of the technicians and other non-musician participants that are crucial to any event. I show that these physical spaces inscribe human judgments about music and sound into “jazz steel” but also emerge as vibrant networks of materials, technologies, and human and nonhuman practices and meanings. This leads to my second, closely related goal, to rethink live performance through an ontologically diverse collection of living and nonliving actors, thus challenging ideas of live performances as occasions for human-only interaction. My third aim is to mobilize the figure of jazz—and, more specifically, the *sound of jazz*—to investigate how the intersection of technology and sonic performance exposes new ways to think through questions of race and difference. Most fundamentally, I argue that the pointedly technoscientific ways that these spaces are objectified and rationalized, and the “high art” acoustic ideals espoused, entangle the jazz played in these spaces with western aesthetic, epistemological, and scientific frameworks that complicate jazz’s political force as an agent of oppositional energy and Black cultural particularity.

0.1. The Field and Field Sites

I draw on multi-sited ethnographic research conducted in and around a diverse collection of jazz performance spaces. I conceptualize the “the field” around three central axes. The first and most important is Jazz at Lincoln Center (JALC), in New York City, an institutional powerhouse that occupies a high-end, purpose-built facility that opened in 2004. My ethnography centers on the facility’s three public-facing performance spaces and the networks of technology circulating through them. JALC is the focus of my larger arguments about sound’s influence on human social life and especially race. My second site is the Montreux Jazz Festival

(MJF) in Montreux, Switzerland, which appears only briefly. During each of my two summer fieldwork trips to the festival, the event had over 15 performance spaces, each with high-end sound systems.

Both JALC and the MJF share a general philosophy of using audio technology to control space using overtly “scientific” tools, techniques, and conceptual frameworks. Much of this shared conceptual framework is exemplified by their implementation of various audio systems designed, built, and installed by Meyer Sound Systems—my third fieldwork axis.¹ Meyer Sound is a manufacturer of high-end audio technologies for live sound. Rather than a traditional ethnographic “site” with geographical coordinates, Meyer Sound threads through this study as a dynamic network of people—mainly technicians—and their shared conceptual frameworks.

0.2. “The Sound of Jazz”: Entering the Field

The germ of this research project presented itself when I stumbled upon a fascinating claim that seemed to come from the public relations wing of Jazz at Lincoln Center (JALC): that their landmark facility was “the world’s first performing-arts facility built specifically for jazz,” and that the performance spaces within the facility were “engineered for the warmth and clarity of the *sound of jazz*” (“History” n.d.; emphasis added). The statement continues: “the whole place is dedicated to the feeling of swing, which is a feeling of extreme coordination....

Everything is integrated: the relationship between one space and another, the relationship

¹ Not unimportantly, Meyer Sound is also a *sponsor* at both sites; without their special arrangements, JALC would not have been able to afford all the technology in their rooms, and MJF, if they could afford it, would most likely decline to do so. I am basing these statements on personal communications with David Gibson and John Uhl, both head sound engineers at JALC, and Mauricio Ramirez, optimization technician for Meyer Sound, MJF. Meyer Sound CEO John Meyer and CFO Helen Meyer expressed to me that JALC was particularly important to their sponsorship business, for it provides a much-needed New York connection key for demonstrations for potential clients. I attended at least ten of these demonstrations.

between the audience and the musicians, is one fluid motion, because that's how our music is" ("History" n.d.).²³ I found these precise words, or close paraphrases of them, in many press articles,⁴ on the JALC website, and in a detailed press release (Marsalis and Fierce 2004).

Though I was unsure to what degree the poetry of these words reflected how the facility was designed, or how its spaces actually *sounded*, it was enticing to encounter in these words many of the concepts I was already puzzling over—namely, the relations between materiality, architecture, sound, and jazz. The words I encountered prompted several questions: what does it mean—or *could it mean*—for a building, a room, or an approach to sound to be made “specifically for jazz”? If a room really could be made “specifically for jazz,” what would this look and sound like, and how would this change how we think of questions of *what jazz is* and *what it means*?

Initially, I had no inkling that these questions would find their way into my doctoral project. Since the late 1980s, some form of Jazz at Lincoln Center has existed. Led by the indomitable energy of Wynton Marsalis, the heralded trumpeter and composer, JALC has

² Another source, a 2004 press release, stated it like this: “the entire facility is conceived for the function and feeling of jazz and designed for warmth and clarity of the music’s ‘golden sound’” (Marsalis and Fierce 2004).

³ Extremely similar language is found in many journalistic sources, likely because they had access to the same press release. Good examples include Ratliff (2004); Pareles (2004a). Direct quotations and close paraphrases are also found on press releases and websites the principal firms in the “Sound of Jazz” team. See (“Jazz at Lincoln Center” n.d.; Rafael Viñoly Architects 2016). Damian Doria (2005), one of the principal acousticians, wrote an extremely close paraphrase in a trade publication, but subtly shifting emphasis, describing the rooms as “creating an experience *informed by* the unique sound, function, and feeling of jazz” (47, emphasis mine). This nuanced wording “informed by” rather than the strong language used by JALC (“engineered for” or “built specifically for”) is perhaps indicative of a more realistic, on-the-ground perspective on how the idea of the “sound of jazz” was interpreted by technicians.

⁴ Just a few well-placed articles parroting these words include (Jacobson 2001; Ratliff 2004; Pareles 2004a). Similar words were found even earlier in an unpublished document by Wynton Marsalis (1998) called “The Ten Fundamentals of the House of Swing,” which JALC provided me from their archives. Numerous written sources (e.g. Jacobson 2001; Marsalis and Stewart 2012) as well as interviews with technicians claim that this document was taken very seriously by everyone involved as a kind of metaphorical blueprint of the facility (e.g., E. Arenius, pers. comm., March 20, 2019; C. Darland, pers. comm., March 20, 2019; D. Doria, pers. comm., April 8, 2019).

become the world’s most well-funded and influential jazz nonprofit. It has made a particular mission of promoting a distinctive vision of jazz as a dignified African American “art” that has since its inception offered US cultural leadership (even if it was only recognized as such retrospectively). As Eric Porter states, at its core JALC presents “a vision that affirms the humanity of black people...[and] places them at the center of American experience” (2002, 288). As important as JALC has been in some circles of the jazz world—only a subset of the vast diversity of improvised music cultures in the US and across the world⁵—the organization has also been the subject of considerable criticism (for some good reasons, as I discuss throughout). And it simply didn’t grab me as a research site.

But the tantalizing claim about a physical building constructed “specifically for the sound of jazz” fascinated me. And it fit perfectly with my research interests, intersecting jazz, sound, space, technology, and race. So, I gathered what I could find from journalistic sources and press releases, along with the websites of the principal firms that designed the facility. The team of acousticians, sound designers, and theater designers hired to fulfill JALC’s vision was widely publicized in popular and trade journalism as the “Sound of Jazz” team. Who *was* this elite squad of jazz-sound superheroes? And what did they actually *do*?

I dashed off an email to Seton Hawkins, a staff member in JALC’s education department. I had met Hawkins casually at a gala where I’d played the piano a couple of years earlier. I was ready to immediately forget I’d sent the email, but just minutes after pressing send, Hawkins responded, cc’ing Doug Hosney. Hosney is Vice President of JALC in charge of all aspects of

⁵ See George Lewis’s (2016) cogent critique of JALC’s as a relatively small, provincial force compared to the vast networks of jazz in the US and across the world—describing JALC and its allies as “simply...local nodes in the US network” (xi).

the JALC complex. A former stage technician and sound engineer, Hosney is the highest-ranking “technical” person in the organization. Hosney often travels with Wynton Marsalis and his bands. He has near-final say on new equipment purchases and, among many other projects, he introduced Marsalis to John and Helen Meyer and fostered the Meyer Sound/JALC relationship which has proved so fruitful (about which much more below).⁶ He was clearly the person to talk to.

I started an email to Hosney, but he beat me to the punch. In his email, he told me I “ask some great questions” but he’d rather answer in person—if I could get to JALC before three o’clock that afternoon. The stakes were immediately raised for a project that had been little more than a casual curiosity. I was still in my doctoral coursework years, far from designing a project or planning my fieldwork, but I hushed my nagging feelings of unpreparedness, put aside other deadlines, and jumped into the field.

Jazz at Lincoln Center’s physical home is called Frederick P. Rose Hall, and it occupies three floors and 100,000-square feet of Manhattan sky rise real estate (Figure 0.1 and Figure 0.2). Rose Hall, as it is generally referred to, comprises the whole complex, which is not to be confused with Rose *Theater*, one of the facility’s three performance spaces. Rose Hall is located at Columbus Circle on the southwest corner of Central Park, at the intersection of West 59th Street, Broadway, 8th Avenue, and Central Park West. For many years, this precise location served as the official geographic center of New York City, meaning that anyone passing one of those big green “New York City 10 Miles” signs on the freeway was 10 miles from this exact

⁶ See Wynton Marsalis (pers. comm., April 13, 2019); John Meyer (pers. comm., April 26, 2019); Helen Meyer (pers. comm., April 26, 2019); Doug Hosney (pers. comm., December 19, 2016).

spot. The idea that JALC would construct its physical home—the “House of Swing,” as Marsalis calls it—at “mile zero” in New York is fitting for an organization that has made its primary mission the assertion of jazz’s central place in heart of the US cultural imagination.



Figure 0.1: Frederick P. Rose Hall, exterior. Photo by Tom Wetmore.

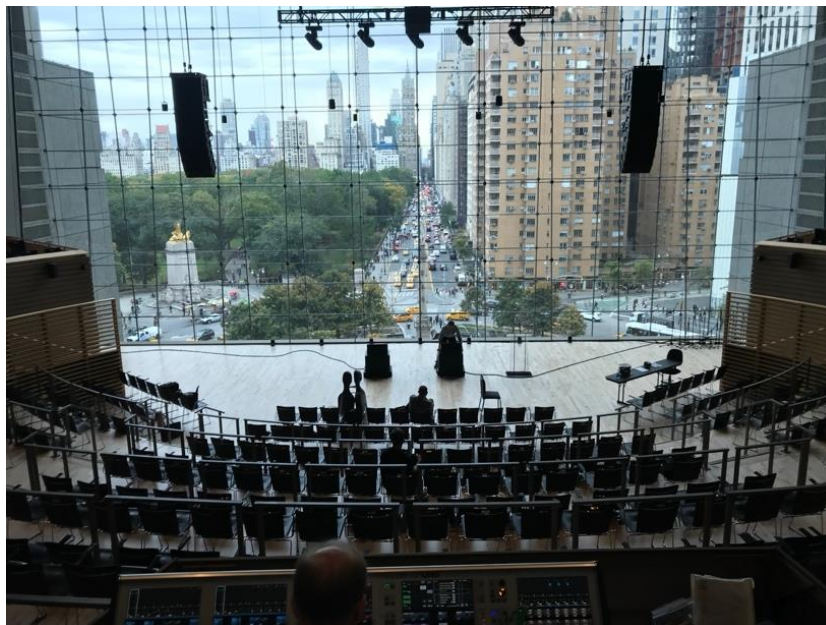


Figure 0.2: JALC's central location, overlooking Central Park, the Manhattan skyline, and Christopher Columbus monument, as seen from the Appel Room. Photo by Tom Wetmore.

In conceptualizing their permanent home, Marsalis and other JALC leaders have been keenly aware that the complex would be not only a symbol, but a durable material force. This aim was articulated most evocatively in a 2001 interview with Marsalis, which took place on the complex's construction site. At one point, strolling around the construction site with the interviewer, both donning hard hats, Marsalis paused to ruminate:

“Jazz steel,” Wynton notes, clutching a naked girder as the late-fall wind whips through the open superstructure. It is a phrase he likes, “because we’re not after something that is going to disappear. We’re building an institution.” That’s what people don’t understand, Wynton says—the need for permanency. (Jacobson 2001)

For Marsalis, the whole facility, down to its barest structural core, is all about embedding the supposed impermanence of improvisation and “swing” into the raw and durable built environment. “It’s powerful symbology,” Marsalis told me. “It means *this is important*. It’s not an afterthought” (pers. comm., April 13, 2019). No longer transient, an “afterthought” to American culture—a longstanding grievance for Marsalis and his intellectual cohort—jazz becomes literally durable, and very tangibly a “thing.”

“Jazz steel” provides a crucial metaphor that threads through this dissertation. In one sense, jazz steel implies a solidity of purpose, a resolve to stick to an utterly serious mission of establishing for jazz a material and symbolic position in the high ranks of US and world culture. At the same time, Marsalis’s specific pairing of his concept of “an institution” to the stubborn rigidity of metal girders might be interpreted as an encapsulation of a logic of conservatism long associated with JALC. As Herman Gray (2005) puts it, while JALC positively asserts Black cultural priorities, claiming legitimation and recognition in racially exclusive institutional spaces, the organization’s logic of canon-formation is “fundamentally conservative”—it disconnects jazz from traditions of innovation and change while restricting the canon to a narrow subset of styles and “great men” drawn primarily from the past. I find it productive to think of JALC’s “jazz

steel” as both a reflection and reinforcement of a general canonical logic that stabilizes one particular vision of jazz with a firm physical structure as a base.

I also think of jazz steel as a broader guide into the problematic of *materialism*. In this dissertation, materialism attends to the many forms of physical matter that contribute to the live performance of jazz—reverberating gases dancing with walls and floors, vibrating diaphragms of microphones and loudspeakers, electrons rushing through copper cables and silicon, and so much more. On the one hand, my work reveals how these and other material phenomena can be shaped to *reflect* human judgments and intentions. For example, the patterned reverberations of a room’s physical acoustics or the design of its sound systems can inscribe specific ideas about what jazz is and what it should sound like (see chapter 1). It is along these lines that JALC’s claims to have designed Rose Hall “specifically for the sound of jazz” ring true. (At least a particular *idea* of jazz and its sound.) On the other hand, I also explore how the materials that make up a room have the capacity to resist human intentions and, at times, catalyze new and unexpected modes of performance that contribute positively to live performances. I thus investigate jazz steel as both a mode of inscribing certain ideas about jazz into arrangements of physical matter and as a framework of analysis for understanding built environments as impactful—even agentive—participants in performance.

These ideas were only half-formed when I arrived at the gleaming towers of the Time Warner Center. I walked through high-end boutiques on the ground level and rode the elegant brushed-steel elevator to the fifth floor, getting off on JALC’s atrium level.

I started a formal interview with Doug Hosney in his office, but less than halfway through the first question—what makes a building “specifically for jazz”?—it became clear that a sit-down conversation was not the most productive way to proceed. We got out of our seats and

walked around the complex. In addition to rehearsal rooms, recording studios, offices, and workshops, the JALC complex has three main performance spaces. We first visited the biggest and most prestigious room, Rose Theater (Figure 0.3). Rose is considered the organization’s “concert hall,” a somber space evoking a visual and acoustic sense of western art music gravity. It is sometimes called JALC’s “analog room” because it evokes in some users a sense of naturalness or authenticity, derived largely from the space’s acoustic “liveness” and “warmth” (terms I analyze at length throughout this study).⁷ Especially for performances of JALC’s house big band, the Jazz at Lincoln Center Orchestra (JLCO), Rose is designed to provide the perceptual experience of an amplification-free, “acoustic sound,” one of the most prevailing sonic ideals at JALC.

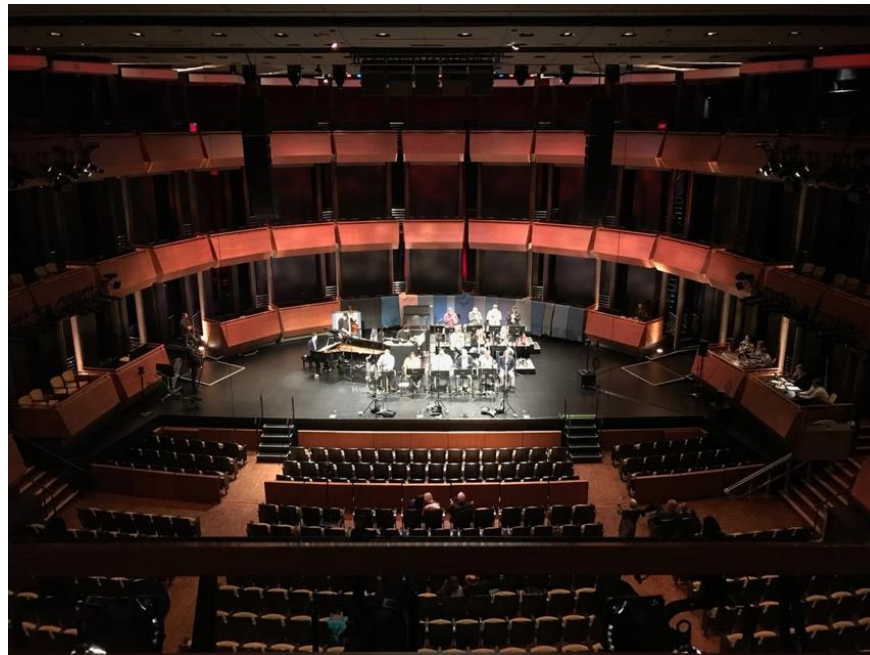


Figure 0.3: Rose Theater during a rehearsal. Photo by Tom Wetmore.

⁷ The clearest articulations of the “analog room” moniker, as well as the contrasting “digital room” name for the Appel Room, discussed below, came from Doug Hosney (pers. comm., December 19, 2016) and JALC Executive Director Greg Scholl (pers. comm., June 6, 2019).

Hosney and I then proceeded to the mid-size Appel Room, where we ran into John Uhl, one of JALC’s two head sound engineers. (The other is David Gibson, who runs the audio crew in Rose Theater, discussed below.) Uhl was busying himself with racks of audio gear, but he jumped up when Hosney and I walked in. In direct contrast to Rose Theater, the Appel Room is referred to as JALC’s “digital room.” This designation refers to the room’s more conspicuous—though not necessarily more extensive—use of electroacoustic technology, which implies to some observers a less pronounced emphasis on “natural,” mediation-free acoustics.⁸ Though I destabilize this distinction throughout this study, on a surface level the Appel Room does seem to have a generally “technological” feel to it: there are more blinking lights, microphones hanging from the ceiling, loudspeakers dangling in front of the eyes, and so forth. The Appel Room also has a more “contemporary” visual aesthetic, deriving largely from its stunning near-panoramic view of Manhattan’s east side skyline, courtesy of a massive 40-foot-high window behind the stage (Figure 0.4).⁹

⁸ I say “apparently” because, as discussed in chapter 3 and elsewhere, the acoustic ideal practiced all around JALC’s rooms is nearly always mediated through electroacoustic technology, even if that technology is designed and recede from conscious awareness.

⁹ The Appel Room also tends to book more non-jazz musical groups and outside productions than Rose Theater, generally exhibiting its “multi-use” design features more prominently.



Figure 0.4: The Appel Room at night, with front of house console at bottom of frame. Photo by Tom Wetmore.

Another distinguishing feature of the Appel Room is its state-of-the-art “variable acoustics” system called Constellation, the newest and most exclusive product of Meyer Sound Systems. Constellation has been described by *New Yorker* critic Alex Ross (2015) as “the acoustic equivalent of Photoshop” (180). Constellation consists of a network of microphones, an even larger network of small speakers distributed throughout the room (the Appel Room has 122), and a powerful digital processing platform running a patented reverberation algorithm. The microphones sense all manner of different vibrations throughout the room, sending them as audio signals to the digital “brain,” which processes and manipulates them. Using a convolution of proprietary algorithms, unique signals are sent to each of the “constellation” of speakers throughout the room. The sound from these speakers, in conjunction with the “natural” acoustics of the architectural space, can make it seem as if the room and its material surfaces are constructed entirely differently than they are. With one tap of the iPad that controls it, Constellation can make the walls seem closer or farther away. The room could sound like a

cathedral or a cramped, acoustically “dead” basement. When the system is turned entirely off, in Uhl’s words, “it’s like when you turn off the holodeck in the starship Enterprise” (J. Uhl, pers. comm., January 27, 2017).¹⁰ He’s right. One doesn’t notice when Constellation is on, but when it’s turned off, it feels like all the air, all the vibrational life, is entirely sucked out of the room. In short, Constellation changes the reverberation in unprecedented, and in some cases physically impossible, ways.



Figure 0.5: The author at the piano, with Constellation’s iPad controller at hand. Photo by John Uhl.

I had read about Constellation in my preparatory research, and before this moment I’d never hoped for more than a little bit of an insider perspective on how it works. But just minutes after walking into the Appel Room, Uhl was wheeling the room’s Steinway D grand piano onto

¹⁰ Uhl is referring to the science fiction television show, *Star Trek: The Next Generation*, which ran from 1987 to 1994. In the show, entire worlds—buildings, cities, planets, sentient lifeforms, etc.—could be electronically simulated, entirely realistically, within a compartment of the ship called the Holodeck. When switched off, the whole artificial world disappeared, revealing a stark blackness with yellow gridlines reminiscent of a Cartesian coordinate system—signifying a kind of mathematically ordered spatial emptiness.)

the stage, handing me the iPad controller, and prompting me to play with both. It was a surreal moment (Figure 0.5). I sunk my hands into the keys against the Appel Room’s majestic behind-the-stage skyline views. As my fingers alternated between tapping the iPad and the Steinway, I felt the room changing around me—it got bigger, smaller; the walls inched farther away, then closer; then they changed shape. These perceptual contortions deeply affected how I played. On shorter reverberation settings (which fade away more quickly, generally conveying a feeling of less spatial volume), it felt natural to improvise more rapid melodies, more intricate rhythmic patterns, and more active changes in harmony. Distinct musical events sounded appropriately distinct. Clear and crisp. Yet, compared to longer settings, the notes sounded ever-so-slightly less “lively”—a term often used to describe the “space” or “glow” that tends to adhere to musical sounds in larger, more reverberant spaces. To borrow the words of pianist Fred Hersch, I just didn’t “feel the love” (pers. comm., September 28, 2017).

Longer/larger settings provided plenty of glow and space, and the acoustic environment felt utterly natural to me: I never would have guessed that much of the “love” I felt was digitally constructed by Constellation’s proprietary digital algorithms. But with the added “air” that comes with this reverberation comes certain musical impediments. Akin to playing in a cathedral or other highly reverberant spaces, musical details like rhythmic transients and dynamic melodies get lost or washed out, yet the same reverberance could let some sounds linger in the most pleasing ways.

I recount this episode for three main reasons. The first is to exemplify how acoustic space—even if it is “artificial” or “digital”—influences not only how music sounds (to audience and musician alike), but how it is *played*. This isn’t a new insight. Certainly not to experienced musicians. As a professional musician myself, I have long encountered the pleasures and pains of

playing in rooms with varying acoustics. A principal goal in this dissertation is to draw more attention to the ways acoustic environments and human-made technologies truly participate in the performance of music and sound.

A second reason I recount this episode is that it demonstrates artfully a simple but fundamental premise of my whole investigation. Put plainly, JALC is an exceptionally *technological* place. Between and within JALC's walls lives a stunning abundance of high-end audio gear, all of it expertly designed, installed, calibrated, and operated. JALC has a dizzying complement of the latest Meyer Sound technologies, which by extension means that JALC has some of the most sophisticated, expensive, and coveted audio equipment in New York. Compared to its peer institutions (Carnegie Hall, the other constituents of Lincoln Center, etc.), the disparity is stark.¹¹ Besides Constellation, which is the most glamorous piece of tech, each of JALC's rooms is outfitted with a top-quality sound reinforcement system (i.e., sound system, loudspeaker system, speaker system, amplification) designed and calibrated by top experts (and I mean *top*; see chapters 3 and 4, and below). The building also has two top-flight recording and mixing/mastering studios, broadcasting studios, extensive broadcasting infrastructure, and an enviable collection of microphones, some of them exceedingly rare. I could go on and on.

¹¹ I'm talking specifically here about electroacoustic technology: things like microphones, loudspeaker systems, and so on. Other organizations certainly put extensive resources into their *physical acoustics* (as did JALC). An example of the disparity in electroacoustic technology: the head audio technician at one of main venues at Lincoln Center's main campus described with envy the "special relationship" between JALC and Meyer Sound, and wondered aloud how the relationship was developed. He told me this during a conversation about his dissatisfactions with the small JBL system the venue occasionally used. In some senses, this disparity is not so surprising considering that the classical music, opera, and ballet cultures represented in Lincoln Center's premier spaces has been historically condemnatory about electroacoustic technology, a point that will become important in my later discussions of JALC's sonic alignments with western aesthetic ideals (on the aversion to amplification at Lincoln Center in general, see E. A. Thompson 2002; Tommasini 1999, 2013; D. Smith 1999).

Lastly, this episode exemplifies just how privileged I have been to be the recipient of immeasurable generosity. Being handed the controls to perhaps the most advanced live audio gear on the East Coast of the US and prompted to sit down at the piano and fiddle to my heart's content is a telling distillation of the countless benefits that were extended to me throughout my fieldwork. While I was certainly lucky, the privileges I experienced were certainly not the result of good fortune alone. And they weren't solely rooted in the fact that the communities I found were composed of exceptional, and exceptionally generous, people—though they *were certainly that*. Indeed, much of my ease in entering the many ethnographic spaces described in these pages was aided by overlapping layers of my own social identity. Not least, I imagine, is my (sincere) presentation as a “nerdy white guy.” Or something like that. This isn't to say that my interlocutors would have acted less generously if I'd presented as anything other than white or male, but I also have no doubt that if I did not speak a certain way, laugh at certain jokes, understand certain vocabulary, express genuine wonder at certain things (and disgust at others), and, yes, have certain qualities of pigmentation, my reception into the spaces described in this study would have been very different. And this is on top of the countless layers of privilege that put me in the position to do a PhD in the first place—or to travel (internationally and otherwise) with no fear that my race would impede me or subject me to violence, discomfort, unnecessary attention, and so forth. I never had to worry about being unfairly stereotyped or hassled. The list could go on and on.

My initial, unexpected sojourn to JALC was a preamble to innumerable trips, leading to an ever-expanding array of fieldwork connections. On the spot, I was invited to come back to attend the next show at Appel. Though I was accommodated with wonderful house seats—usually reserved for VIP guests and journalists—when I arrived for the concert Uhl invited me to

sit next to him at the front of house console. It was a seat that I ended up sitting in for many shows, learning not only what goes on before, after, and during a public performance—observing everything that happened on Uhl’s massive mixing console (and in radio communication with his crew)—but affording me hours and hours of deep listening. For a long while, Uhl was my primary contact at JALC, and we developed a friendly relationship rooted in a shared wonder at technology and a deep love of jazz.¹² He invited me to technological demonstrations,¹³ concerts, and other public and non-public events. Rarely was any door left closed to me.

Starting with connections made through JALC, I ended up meeting all the most influential technical staff in the Meyer Sound hierarchy. This included Bob McCarthy, a guru-like figure in the world of sound system design.¹⁴ As discussed in chapters 3 and 4, McCarthy designed and “tuned” JALC’s sound systems, and he developed or co-developed most of the techniques that the live sound industry now uses to quantify and digitally manipulate sound reinforcement over physical space. He also co-designed, along with John Meyer, another interlocutor, most of the technologies used for these purposes. McCarthy graciously allowed numerous interviews and invited me to multiple system installations and tunings.¹⁵

¹² In my experience, loving jazz is *not* a given at JALC or any other place jazz is performed. Of the audio staff I encountered at all the venues I researched, Uhl seems to be the biggest jazz fan. Some don’t like it at all.

¹³ Such demonstrations are common at JALC. Part of the relationship between JALC and Meyer is that in exchange for the latest technologies (and in some cases certain discounts), JALC would serve as a showcase for Meyer products.

¹⁴ Among other things, McCarthy literally wrote the book on the subject (McCarthy 2016), which is commonly described as “the green bible” (e.g. M. Ramirez, pers. comm., January 19, 2019). I discuss McCarthy’s background and reputation at length in chapter 4.

¹⁵ Not to mention the obligatory schmooze sessions with potential Meyer clients—Broadway engineers, audio rental houses, etc. This kind of thing happened a lot with most of my key interlocutors from Meyer.

I also collaborated significantly with Steve Ellison, Meyer Sound's Director of Spatial Sound. Based in California, Ellison co-designed Constellation when he was the CEO of LCS, a pioneering provider of spatial sound systems until Meyer Sound purchased the company and added LCS's products to its own lineup.¹⁶ Among other things, Ellison and I co-presented a paper at the Annual Meeting of the Acoustical Society of America. Ellison also participated in a collaborative project I organized to study JALC's Constellation system using jazz recordings captured in the famous anechoic chamber at Nokia Bell Laboratories.¹⁷

At the first Constellation demo I attended, I met John Monitto, Meyer Sound's Director of Business Development.¹⁸ Monitto was my crucial link to the Montreux Jazz Festival, which I attended in the summers of 2016 and 2017. Meyer Sound has been sponsoring the festival for over 30 years, and it is the jewel on Meyer's summer festival calendar (John Meyer was for decades a close friend with the festival's founder, Claude Nobs). At the festival, Meyer Sound furnishes their newest products, they advertise profusely,¹⁹ and they run an elaborate hospitality operation for VIP guests. Fortunately for me, because of this VIP operation, there was nearly always a supply of spare all-access festival passes that Monitto was happy to direct my way.²⁰

¹⁶ A graduate of Wesleyan University, Ellison has a long-held fascination with ethnomusicology, so he was excited to work with me.

¹⁷ This project, a collaboration I initiated with members from Columbia's Computer Music Center (Seth Cluett), New York University (Paul Geluso), Nokia Bell Laboratories (Walter Etter), JALC (John Uhl), and Meyer Sound (Steve Ellison), was unfortunately interrupted after completing our recordings at Bell Labs due to the arrival of the Covid-19 pandemic.

¹⁸ Like most of Meyer's higher-level executives, Monitto worked through the ranks as a sound engineer, technical support specialist, and so forth. So he's an expert on the tech.

¹⁹ The Meyer logo is plastered all over the grounds, right up there with household names like Heineken and UBS bank.

²⁰ On the odd occasion that all of Meyer's passes were taken, representatives from DiGiCo, the festival's console sponsor, stepped in to give me one.

I ended up with nearly unfettered access to the Montreux Jazz Festival's behind-the-scenes operations. Courtesy of Meyer passes, I bounced between constant gigs, usually from around noon to well past 2 a.m., sprinkled in with sound checks, the occasional tech emergency (such as a finicky console or, more often, a finicky guest engineer), and social events.²¹ As I discuss in chapter 4, I observed every step of designing, constructing, and “tuning” an acoustic space using loudspeaker systems. MJF was an especially fruitful location for this fieldwork, for it includes over 15 performance spaces, all of which have a newly designed sound system each year. Indeed, many of the venues themselves are physically rebuilt each year out of modular construction materials.

From the first trucks loading in equipment a week before the festival, to the final load-out three weeks later, I observed every step. Among the many technicians and staff that were invariably enthusiastic to answer any question were festival Sound Coordinator Martin Reich, Head Sound Engineer, Optimization Engineer, and front-of-house engineer Jose Gaudin, and all the individual front-of-house and monitor engineers at the individual venues. Gaudin was an especially important interlocutor. He designed all the festival's sound systems (and provided me the computer design files), tuned most of them, and was the front-of-house engineer for the festival's only “jazz” venue—the Montreux Jazz Club.²²

²¹ Social events included meet-ups multiple times a day at one of the festival's restaurants where Meyer kept a table constantly reserved), led to too many introductions and conversations to properly document.

²² As I discuss in chapter 4, despite its name, the Montreux Jazz Festival has for many years presented far more “popular” music than what most would consider “jazz.”

0.3. Back in the US

In the second major phase of my US fieldwork—after my extended work with John Uhl on various projects centered around the Appel Room—I shifted focus to Rose Theater. There, I spent my most intense period of daily fieldwork, working closely alongside JALC’s second Head Sound Engineer, David Gibson. It was in this 8-month stretch that I became such a constant presence at the building that most staff members stopped wondering who I was and just accepted me as part of the scene.²³ While for the first week or so I needed to get a guest pass from the stage door security guards to get into the building (which meant making sure someone put me on a guest list), it didn’t take long for such formalities to fade away. I came and went as I pleased, and for these crucial months I strictly followed the schedule of Gibson’s crew. This often meant many consecutive days arriving at 8 a.m. and leaving at 11 p.m.—or later.

From this perspective, I gained access to virtually all backstage happenings, both during gigs and in the equally eventful periods of preparation and maintenance when formal performances were not taking place. This meant innumerable sound checks, rehearsals, recording sessions, load-ins, load-outs, set constructions, speaker repairs and replacements, sound system installations and re-instillations, film premieres, prep school graduations, stockholder meetings, galas, business conferences, the Sports Emmy Awards, other television broadcasts, and much more. (As I discuss in chapter 5 and elsewhere, music—let alone jazz music—represents a minority of JALC’s total bookings.) While union rules strictly forbade me from working, I observed every aspect of a top-notch audio crew and a wide range of related activities—asking incessant questions, enjoying coffee and meal breaks, relaxing and joking around when the

²³ I was occasionally thanked by certain staff members and visitors as if I were a member of the stage crew. This usually happened too quickly for me to explain that I didn’t actually work there.

workload was low (which, curiously enough, often occurred during show times, which can be pretty low intensity for stagehands).

As a consistent presence, I was able to approach interlocutors casually, developing rapport through everyday hanging out, then proceeding to more formal/technical questioning and interviewing.²⁴ All of the stagehands—especially Gibson’s audio crew but also the carpenters and electricians²⁵—knew who I was and often pulled me aside when they were going to do something they thought I might be interested in. After a while, some stagehands started expressing compliments that I kept showing up day after day. On especially difficult weeks with exceptionally long hours, some expressed confusion about why I would stick through it all. (A common joke, of which I heard many variations, was when a stagehand would walk up to me early in the morning and say, “Wow, you’re back again! When is this guy going to get his union card?”²⁶) Besides Gibson and his crew, with whom I developed a close friendly relationship, I spent considerable time with artistic directors, visiting staff, the two engineers operating JALC’s recording studios, and numerous regular musicians from the Jazz at Lincoln Center Orchestra.

²⁴ This even led to a humorous anecdote with one particular stagehand, Mark Critelli. Critelli was the youngest stagehand I worked with regularly, and thus the closest to me in age, and we shared a bond of attending William Paterson University, at the same time, as it turns out. (We both vaguely remembered each other, and the dates matched up.) I did a 2-year master’s in Jazz Performance there, overlapping with Critelli’s 4-year bachelor’s in the school’s well-regarded Sound Recording Technology program.²⁴ I described my research to him numerous times, and he was one of the few interlocutors who cared much about knowing what an “ethnographic” or “cultural” study of sound engineers might be. One time, at a moment entirely unrelated to such conversations, he abruptly stopped what he was doing, turned to me, and said: “Oh! I get it! You’re like Jane Goodall and we’re the chimps!”

²⁵ As is the long-held custom, stage technicians at JALC are separated into three categories: audio, electrics/lighting, and carpentry.

²⁶ Getting a union card meant gaining full admission to the Local 1 chapter of IATSE, the powerful international union of stage technicians and theater workers. JALC is a “union house,” and virtually every stagehand working there was either a union member, and apprentice, or working toward union membership in other ways. Some of the most common everyday topics of conversation in backstage life revolve around whether a person has a union card, how long they are from getting one, how long they’ve had one, and so forth.

Among these people was Wynton Marsalis, who I chatted with casually a handful of times backstage and in the hallways before sitting down for a formal interview in his private suite. Also important were Billy Banks, Wynton Marsalis’s touring manager (for well over 30 years), and David Robinson, Marsalis’s personal “sound man.” Outside of my onsite research, I interviewed all the surviving major players in the “Sound of Jazz” Team,²⁷ including acousticians Sam Berkow, Damian Doria, and Ed Arenius, sound system designers Tom Clark and Bob McCarthy, and founding-Executive Director of JALC, Rob Gordon, among others. Some of them shared documents and photos from the design and construction process, as did the office of Rafael Viñoly, the building’s architect.

Combining all these perspectives with my own study of written sources, has allowed me to put together a story of the “sound of jazz” that reveals surprising richness. It is a complicated story, one with few firm answers—except perhaps one, which I asked myself almost immediately upon reading JALC’s evocative press materials: did they *really* mean it when they said the building was built for the “sound of jazz”? Yes. They really meant it. And they took it *very* seriously, dedicating unprecedented resources and talent. Yet the most crucial questions remain: what exactly *is* the sound of jazz, and how did the team go about encoding it into the “jazz steel” of the JALC complex?

0.4. “Jazz Steel” and “Pure and Clean” Sound

The most useful descriptor I encountered for JALC’s dominant sonic ideal is “pure and clean” sound. I heard this phrase numerous times, from multiple interlocutors, including on my

²⁷ Russell Johnson, the most senior of the acousticians on the team, died in 2007. A memorial service was held in JALC’s Appel Room.

first day at JALC (D. Hosney, pers. comm., December 12, 2016). The trope of pure and clean sound refracts not only a core cluster of sonic ideals but also a range of ideas intersecting culture, society, and technology.

Pure and clean sound means many things at JALC. A pure and clean sonic space is transparent and nuanced. One can hear every instrument, and, as John Uhl told me, “a piano sounds like a piano.” In short, it has “high fidelity”: what reaches the listener’s ears is meant to faithfully reproduce an idealized expectation of the musicians’ “real” sound, as if there were no intermediary technology. A listener should be able to distinguish—if they possess sufficient listening skills—all the different instruments, their tonal nuances, and various intricacies of melody, harmony, rhythm, dynamics, and so on.

There also should be no audible distractions: perceptible amplification (chapters 1 and 3), “noise” from the outside world (chapter 2), or extraneous audience sound (chapter 2). Sound systems are chosen, among other things, for their transparency and detail: they are meant to deliver highly detailed, accurate representations of idealized acoustic sounds, delivering the full acoustic nuance of the “original” from the stage—a technical challenge requiring expensive, high-end technology. Yet the technology itself must recede from the listeners’ awareness. An overarching dictate, as Hosney told me, is for engineers, and thus technologies, to “make yourselves invisible” (see chapter 3).

All of these acoustic ideals are espoused for at least two main purposes: (1) to allow for unobstructed interaction amongst listeners and musicians (who are also listeners) and (2) to foster “pure listening” (Hosney, pers. comm., December 12, 2016). Nuances must be perceived clearly. Minute gradations of tone and volume must be carried to the ears without degradation or masking. Subtle aural (and visual) cues between musicians must be coherently perceived and

quickly reacted to. To many of my interlocutors, feeling the presence of electroacoustic technology means disturbing, as Doug Hosney told me, “the emotion in air”—the “uninterrupted flow” that jazz ideally provides between and among musicians and listeners (pers. comm., December 12, 2016).

My research confirms that Wynton Marsalis was sincere when he declared his desire for the “House of Swing” to “swing.”²⁸ Hosney meant it when he said that the sound is supposed to foster “communication” and “emotion in air.” The acousticians and sound designers interviewed for this project all verified that jazz-specific ideals of audience-and-musician interaction, intimacy, and call-and-response were all impactful to their designs. As I discuss in chapter 1 and elsewhere, these and other sonic properties exhibit meaningful connections to jazz and other Afrodiasporic musical forms. They represent genuine attempts to inscribe jazz specificity—or at least one institution’s rendering of jazz’s core attributes—into the materiality of these spaces.

But I also expose important ways that JALC’s approaches to sound are not so specific to jazz. Most notably, I argue that the “pure and clean” ideal is deployed in part to buttress JALC’s assertion of jazz as a serious, nuanced, complex “high art” which is properly contemplated in a serious posture of close attention, thus aligning with certain Eurocentric notions of aesthetic appreciation. This is surely intentional.

One of the most prominent ways that the pure and clean aesthetic manifests is in an overall preference for an “acoustic sound” (Hosney, pers. comm., December 12, 2016), one that requires not only that electroacoustic mediation recedes from perception but that the room’s physical acoustics be finely tailored to the expectations of western concert hall standards. In

²⁸ Marsalis is in the record saying this in many places. See especially Marsalis and Fierce (2004); Marsalis (1998).

other words, the reverberation of JALC's rooms—the patterns of reflected sounds, reflections-of-reflections, and so on—is meant to provide what Marsalis has called “the golden sound of jazz.”²⁹ As I show in chapter 1, while this sonic ideal involves certain acoustic parameters tweaked to align with particular judgments about unamplified jazz, the acoustics of Rose Theater are also strikingly evocative of ideals of western concert listening and associated tropes of acoustic/spiritual transcendence and exceptionalism overrepresented in the Eurological musical imagination. Indeed, Marsalis has long asserted jazz as a high art, often in specifically western terms (see especially Marsalis 1988, 1986). He has even openly implied that his ideal “golden sound of jazz” was a kind of jazz-specific riff on a preexisting “golden sound” of classical concert halls.³⁰ In chapter 2, I illustrate further resonances with concert hall listening by examining JALC's dramatic acoustic isolation from the external world and its cultivation of a culture of quiet, contemplative listening consistent with western art music appreciation.

0.5. Meyer Sound and “High-Fidelity”

One of the fascinating ironies about JALC's approach to technology is that they prize an “acoustic sound” while using dramatically high-tech approaches to provide an illusion of it. This is a key topic of chapter 3, which introduces Meyer Sound Laboratories and their vociferous espousal of a “scientific approach” to high-end sound reinforcement. Meyer Sound's sound systems are widely known for being “high-fidelity,” “accurate,” “transparent,” “high-tech,” and

²⁹ See Wynton Marsalis (pers. comm., April 13, 2019); Lengel (2015); Reich (2004).

³⁰ Here's what Marsalis told a reporter from the *Chicago Tribune*: “We want to get in our new Rose Hall...the type of golden sound that orchestras have in the best concert hall.” He then went on to say that such halls don't fit jazz because they have “this really long tail of the echo” (Artner 2002; see also Gallo 2004). Marsalis also told me that the development of Rose Theater's acoustics was the product of discussing with Sound of Jazz acousticians Russell Johnson and Sam Berkow (the latter accompanied the JLCO on tour) all the different acoustical aspects of various concert halls and theaters they played in.

simply “really good sound” (J. Uhl, pers. comm., November 28, 2017). All of these terms, and a range of related ones, can be exceedingly slippery, both in everyday practice and in technical terms. I will interrogate them throughout the chapters that follow. What is entirely clear is that Meyer systems are forbiddingly expensive (generally considered the most expensive of their elite peer group),³¹ complex to install (usually requiring highly trained Meyer technicians), and amongst the few in the industry deemed appropriate for reproducing the nuances of acoustic instruments (most notably for classical music).³²

Above all, Meyer is best known for their explicitly “scientific approach” to designing and implementing audio systems. More than any of its peers, Meyer Sound emphatically expounds on ideals of objectivity, scientific methodology, and the epistemological authority of ultra-precise technoscientific instruments. As I discuss at length in chapter 4 and elsewhere, the company’s dedication to science is expressed in everything from branding materials and everyday talk to the design of the technological artifacts themselves. Meyer has been first to introduce a range of important innovations to the audio world. Most notably, Meyer Sound developed the instruments and methodologies for using digital measurement and processing

³¹ On Meyer as the most expensive, see David Tabachnik, front-of-house engineer, Montreux Jazz Festival (pers. comm., July 7, 2018); Brendan Tendrich, head sound engineer at Alice Tully Hall (pers. comm., March 14, 2019); Seth Cluett, sound artist (pers. comm., March 14, 2019), among many others. Of its peers, the only company that consistently arose as a meaningful competitor among US technicians was d&b acoustics (see T. Clark, pers. comm., March 26, 2019; S. Cluett, pers. comm., March 14, 2019; N. Lazzaro, pers. comm., March 14, 2019; M. Conrader, pers. comm., May 3, 2019). In Switzerland, there is a more pronounced presence of French outfit L-acoustics. (This company is also widely adopted in the US and elsewhere, but for whatever reason I rarely if ever heard it mentioned by the US-based technicians I worked with.)

³² It is generally acknowledged that “acoustic” instruments require more detailed reinforcement than “electric” instruments. The basic reason is that the culturally mediated perception of acoustic instruments is more contingent upon accurate and detailed frequency and dynamic information. That is, to make a “piano sound like a piano,” as John Uhl told me, requires more detailed, less distorted reproductions than an electric instrument like an electric guitar, whose sound already contains much of the same distortions that sound reinforcement systems commonly introduce. There is wide agreement that such distinctions are less noticeable in electric instruments.

systems to objectively “tune” acoustic spaces for evenness of coverage and transparent, accurate sound reproduction.³³ As discussed in chapter 4, such processes posit a distinctive ontology of sound and space as objective, rationalizable objects of scientific observation and manipulation.

From what I have just described two critical themes have emerged: (1) sonic ideals of “acoustic” purity and cleanness, redolent of western concert-hall environments and (2) technoscientific modes of understanding and manipulating sound and space. As I discuss below, and as I turn over and over throughout this study, there is a striking dissonance between sonic ideals of purity, cleanness, objectivity, rationality, and universalism and some of the most durable conceptions of about the sound of jazz. But before I discuss these pivotal sonic and conceptual dissonances, I will now introduce a more overarching axis of this study.

0.6. Taking “Things” Seriously

To put it simply, one of the most encompassing aims of this dissertation is to demonstrate how all this technological conditioning works—how the “sound of jazz” comes to sound the way it does in the spaces I observed. I analyze what technologies are used, in what arrangements, and with what philosophical and practical investments. In this way, I provide new ways to understand live performance with more attention to the actions of non-musicians (technicians, designers, listeners, etc.) and the participation of various sound technologies and other physical materials. I thus contribute to research that has challenged the idea of live performance as an unmediated, privileged site of musical authenticity, revealing how even the “original” performance is complexly overdetermined by human and non-human/technological intervention (see, e.g.,

³³ These terms will be interrogated throughout this dissertation, and especially in chapters 3, 4, and 5. For now, a serviceable gloss might be the commonsense notion of “high-fidelity,” though that term will also be interrogated.

Slaten 2018; Novak 2013; Auslander 1999; cf. on “liveness” in the studio, see Meintjes 2003; Porcello 2005; Sterne 2003).

Such an inquiry shares much of its orientation with Steven Feld’s concept of *acoustemology*. Acoustemology probes modes of acoustic knowing that flow through the embodied experience of place, and it draws our attention to how acoustic worlds, and one’s experience of them, are constituted relationally through the sonic interconnection of humans, nonhuman organisms, and nonliving things. As Feld states:

No study of music today can ignore the history of mixings of organic and mechanical materials, specifically technological enhancements of primal bodily capacities. Human life takes place not only in the regular company of non-human species; it takes place in the company of non-human objects, many assemblages of animate and inanimate, organic and mechanical. In part we are all as defined by our interactions with technologies as we are defined by our interactions with other persons or species, and this has tremendous implications for knowing in and through sound. (Feld 2017, 94).

In line with these sentiments, I aim to emphasize the trans-material relationality through which live performance manifests. For example, in the listening situations I study, *the rooms* that provide my main analytical objects are composed not only of walls and stages and seats and floors, but the gasses and solids that allow vibrations to travel across space, as well as the technological infrastructure that mediates transduced encodings of such sounds.

But my study differs from Feld’s in at least one crucial respect. For Feld, acoustemology “do[es] not specifically engage acoustics on the formal scientific plane that investigates the physical components of sound’s materiality” (Feld 2017, 84–85). Feld privileges the living subject as listener, a figure that, while relationally situated to the subjects and materials around it, still stands at the “experiential nexus of sonic sensation” (85). Though I entirely agree with Feld on the importance of the “audible plane” of phenomenal experience, I differ in making science, acoustics, and the “physical components of sound’s materiality” central to my project.

In studying the intersections of science, technology, and sound, I draw on a range of theoretical perspectives, from which I will now single out two general tendencies. The first considers technological artifacts and systems as “socially constructed” entities shaped by human desires and values. Here, technological artifacts, systems, and the built environment “take on themselves the contradictory wishes and needs of humans and non-humans” (Latour 1992, 247). Among other inquiries, such insights are found in Science and Technology Studies (STS) and especially the sub-field known as SCOT (the Social Construction of Technology) and its descendants.³⁴ I also draw on sound studies, including Jonathan Sterne’s important cultural histories of sound reproduction (2003) and digital audio compression (2012); Emily Thompson’s studies of architectural acoustics as a function of capitalist modernity (2002) and fidelity in early sound recording technology (1995); and a range of others. Such studies reveal how technological artifacts and practices can present themselves as neutral, objective “things” while on closer inspection they reveal significant particularities about their social and cultural origins. At the same time, they codify and stabilize human social behavior, while allowing “interpretive flexibility” (2002) that evades technological determinism.

As I show throughout this dissertation, the technologies in the rooms I researched, and the materiality of the rooms themselves, are powerfully encoded with human desires, ideologies,

³⁴ SCOT, itself one of the earliest “movements” in STS, was itself an offshoot of an inquiry known as the Sociology of Scientific Knowledge (SSK). All these inquiries, and more, were inspired in large part by Thomas Kuhn’s classic, *The Structure of Scientific Revolutions* (1996). Exceptional studies informing my approach to technological systems and their capacity to reflect (and direct) human action, outside actor-network approaches, include works by Harry Collins (1992); Karen Bijsterveld (2008); Wiebe Bijker, Thomas Hughes, and Trevor Pinch (2012); Steve Woolgar (1990); and Lucy Suchman (2007). Out of SCOT specifically have come the most impactful intersections with *sound studies*, especially Pinch and Bijsterveld’s (2012) technology-oriented *Oxford Handbook of Sound Studies*, which follows up on an important sound-oriented special issue of science studies’ premier journal, *Social Studies of Science* (Pinch and Bijsterveld 2004). Pinch and Trocco’s (2004) ethnographically informed history of the Moog synthesizer is an important book-length work of musical sound studies from a scholar (Pinch) firmly established in the disciplinary tradition of science studies (see also Bijsterveld 2008)

and expectations, and they are involved, overtly and covertly, in conditioning human action. In chapter one, for example, I show how the solid materiality of JALC's largest and most prestigious performance room—Rose Theater—reflects a specific aesthetic ideology. Most important, the carefully designed architecture of the room encodes various genre-based characteristics of JALC's particularistic ideal “sound of jazz” into the physical patterning of acoustical waves and their reflections throughout the space. As STS scholar Tom Gieryn (2002) writes in his article, “What Buildings Do”: “The interests of powerful voices in the design process are etched into the artifact itself” (42). In this part of the inquiry, I seek out ways that the “jazz steel” I investigate becomes aligned with judgments and conceptions about jazz, music in general, and broader sonic and social practices.

But I don't merely discuss how technology reflects or enacts human thoughts or desires. I also propose a more active and even agentic role for the technologies and physical bodies I describe. I seek out moments when collections of matter act as unpredictable agents. I observe nonhuman objects and things that often cooperate with human desires—but sometimes don't. While this nonhuman influence often manifests in moments of *resistance*—machines breaking down, prompting adjustments, etc.—they also, at times, exert unpredictable and even “creative” influence on sonic performances. Such moments are intertwined with a variety of human actions—primarily in the labor of stage technicians and other technical professionals.³⁵

³⁵ Classic ethnographic analyses of musical performance have often focused on the “punctuated” aspects of performance that mark moments of performance and ritual as distinct from “everyday” life. Such studies have proposed models of “framing” (Goffman 1974), “cueing” (Gourlay 1972), “keying” (Bauman 1975), or the performance “occasion” (McLeod 1966; 1975). For other key ethnographic studies of musical performance, see McAllester (1954); Herndon (1971); McLeod and Herndon (1980); Béhague (1984); Seeger (1980, 2004); Qureshi (1995); Feld (2012); Fox (2004); Sugarman (1997); and various papers collected in McLeod and Brunyate (1975). For jazz performance as a ritual distinct from, and in some ways transcending, everyday experience, see Jackson (2003, 2012).

0.7. New Materialism and the “Nonhuman Turn”

In grappling with these questions, I propose new ways of thinking about live performance, material and discursive spaces and places, and the “complex choreography of matter” that entangles human actions and intentions with non-living objects and “things” (Coole and Frost 2010, 9). I take seriously the notion that rooms, as solid structures and networks of technology, may “respond” to certain sounds, and, through interaction with human musicians, listeners, technicians, and other participants, these material collectives mutually construct these spaces and the sonic performances that proceed within and through them. By attending closely to networks of human and nonhuman material processes we may find new ways of rethinking human and non-human relations with and within an expanded material world.³⁶

Though I draw from a wide range of inquiries in the recent “nonhuman turn” (Grusin 2015), I take particular inspiration from three intersecting streams: Actor-Network Theory (ANT), “new materialism,” and certain threads of (antiracist) feminist science studies.³⁷ Broadly speaking, ANT, originally situated in science and technology studies, proposes revamping social scientific inquiry to include sprawling bundles of associations (or “networks”) between all sorts of human, nonhuman, and non-living objects and things. Here, “the social” takes on a revamped,

³⁶ Another stream of thinking that clearly fits the idea of a “nonhuman turn” as I’m discussing it is what has been called “speculative realism.” While I am an avid student of this work, I do not find it useful here. As I discuss more in chapter 5, I find numerous streams of speculative realism to be exemplary of a certain brand of “ontological” inquiries that go too far in forsaking the salience of questions of culture and meaning in favor of supposedly more universal “properly ontological questions” (Bryant, Srnicek, and Harman 2011b, 4; see critiques by Bennett 2012; Z. I. Jackson 2015; cf. from the perspective of sound and listening M. Thompson 2017).

³⁷ Though I do not cite them often in this dissertation, my positions on “things” and the nonhuman is influenced by recent “turns” to matter, ontology, and the nonhuman in anthropology (Henare, Holbraad, and Wastell 2007; Viveiros De Castro 2015; Strathern 1991; Wagner 2016)

undulating, and emergent form.³⁸ Such theories are especially useful for thinking about intersections of technology, epistemology, and nonhuman actors as quasi-agentive assemblages whose vast complexities provide the conditions of possibility for emergent forms of sociality and world-building.

A recent intellectual inquiry has been oriented around the moniker “new materialism”—an inquiry that often builds on elements of ANT but, in the cartography I frame here, is more marked by a specifically materialist lineage from pre-Socratic philosophy to Spinoza to Deleuze and Guattari and beyond (e.g. Bennett 2010; Coole and Frost 2010; Barad 2007; DeLanda 2002; 2006; Braidotti 2013). Jane Bennett (2010), for instance, in her proposal of “vital materialism,” offers a model of “distributed agency” that challenges us to tune ourselves to the possibility of surprises emerging from assemblages, or “confederations,” of matter that exhibit emergent capacities for creativity. New materialism overlaps considerably with ANT, but I find that it provides a deeper attendance to the “thingliness” of matter—the solidity of solids, the gassiness of gasses. Such inquiries are less oriented around networks of objects as defined by technoscientific epistemologies (though such topics are certainly addressed) and more about the conative drive and “vitality” of physical matter itself. Here, the “thingly” qualities of matter materialize in “vivid entities not entirely reducible to the contexts in which (human) subjects set them, never entirely exhausted by their semiotics” (Bennett 2010, 5). New materialism also

³⁸ Relevant classic works in this stream include Latour (1987, 1988, 1993, 1996, 1999); Callon (1986); Law (1986, 2004). On revamping “the social” as emergent and ontologically diverse, see Latour (2005). See also Harman (2016); Stengers (2005); Mol (2003). On debates between ANT and SCOT, and the general contrast between models of nonhuman “agency” versus social construction, see the now-famous “epistemological chicken debate” between ANT scholars Bruno Latour and Michel Callon (1992) and SCOT scholars Harry Collins and Steven Yearly (1992). It must be mentioned that former firm distinctions and intellectual disagreements (which, as far as I can tell, have always been collegial and, usually friendly) seem to have died down, and today an eclectic theoretical landscape allows current scholars to borrow freely, as I do, from various models (see, e.g., Pinch 2015; Pinch and Tosoni 2017).

contributes stimulating discussions about *the body*, and how human differences like gender and sexuality may be constructed through overlapping material and discursive processes (see, e.g., Braidotti 2013; Barad 2007; Grosz 2011; cf. Ahmed 2008).

Intersecting this recent wave of new materialist thinking is an “older,” though still-vibrant intellectual lineage often referred to as feminist science studies. I am especially influenced by the foundational work of Donna Haraway and her intellectual cohort.³⁹ I take special guidance from Haraway’s proposition of the “material-semiotic” as a nexus between the embodied and the discursive. This critical concept, which has taken many forms since Haraway started using it in the 1980s, has provided many scholars with new ways to think the inextricability of bodies (human and otherwise), technologies, and all manner of material objects and systems, especially as deployed in the production and contestation of knowledge (1988), identities (1991), and worlds themselves (2003, 2016; see also Haraway’s more recent concept of “naturecultures”; cf. Barad 2007; Law 2004; Mol 2003). Unlike many science studies scholars, Haraway has maintained an unwavering political posture that strives to uncover and challenge the white male-centric figurations that have indelibly shaped the foundations of western technoscience and its close links to late capitalism, militarism, racism, gender oppression, and much more (Haraway 1988, 2018).

0.8. Jazz, Technoscience, and Race

Donna Haraway is one of the exemplary exceptions to a troubling tendency amongst the various recent critical “turns” to the nonhuman. Namely, in the process of gesturing toward

³⁹ Particularly relevant to this study are Traweek (1992); Potter (2001); Harding (1995, 1992a, 2016b); Keller (1992); Barad (2007).

figures of the non-, anti-, or posthuman, such inquiries have at times “looked beyond” human differences. By shifting toward the nonhuman, often privileging a “properly ontological” reality presumed to lie beyond representation or culture (Bryant, Srnicek, and Harman 2011a, 4; see critique by M. Thompson 2017), some inquiries leave the category of the human, with all its potential differences, underexamined. The fatal flaw in such inquiries, according to Alexander Weheliye (2014), is in “supposing that all human subjects occupy the space of humanity equally” (11), and thus forestalling political action that might address very real lived inequalities structured around human difference. I thus align with thinkers like Weheliye, Zakiyyah Jackson (2015), and Diana Leong (2016), who recognize the challenge of accounting for the nonhuman without detracting from the very real problems of human difference and their consequences.⁴⁰ As Ibram X. Kendi (2019) writes, “Race is a mirage but one that humanity has organized itself around in very real ways” (54). It is essential to not allow a focus on technology and the nonhuman to distract us from interrogating this impactful mirage.

Thus, another of my interventions delves into questions of race and its overlapping linkages with other modalities of difference. How does jazz, sound, and technology intersect with race? In addressing this question, I am guided by a central dissonance I observed repeatedly in my fieldwork: the intersection of jazz, and its long associations with Black cultural particularity, with some of the most cherished pillars of western pretenses of universality: science and high art. Put differently, I explore the productive tension between discourses of jazz as “ethnically particular” (Monson 2007) and regimes of sound mediation that align jazz with (1)

⁴⁰ See also Fouché (2006) for a critique of science studies, and specifically ANT, for its deafness to race, which helps to reinforce an preexisting “adversarial relationships African Americans have had with technology” (640) as constructed in the western world. Such constructions selectively elide, and thus marginalize, what Fouché calls “black vernacular technological creativity.” These constructions contribute to what Weheliye calls an “assumption that black cultures are somehow pre- or antitechnological” (3).

discourses of universal high art aesthetics, (2) associated notions of “colorblind” musical universalism, and (3) epistemologies of scientific objectivity and rationality.

The first two of these axes—jazz as art and jazz as “colorblind”—have been discussed virtually from the beginning of jazz history.⁴¹ I find new ways to think about these two narratives (art and colorblindness) while linking them to the third axis, science and technology. I propose sound as the mediating link between the three. To address this dissonance requires more background on the history of jazz, and especially how aspects of its *sound* have carried significant social importance.

0.9. Jazz History: Blackness, Freedom, and “Irreducible Materiality”

One of jazz’s most important attributes has been a power to resist hegemonic projects of social inequality. In this dissertation, I align myself with those, such as Guthrie Ramsey, who defend a certain “ethnocentric energy” intersecting the various forms of cultural production widely referred to as “African American” or “Black” music.⁴² Like Ramsey and many others, I reject notions of racial essence or biological determinism.⁴³ I further reject reductive “black/white” paradigms of race that so often undergird conversations about race in the United States (see, e.g., Perea 1997). Race is considered in this study as a complex, hybrid, overdetermined network of relations mediated through power, ideology, affect, and more—and never extricable from gender, sexuality, class, and other overlapping modalities of difference. Yet, despite my underlying impulse toward *complicating* and *destabilizing* overly essentialist

⁴¹ Of the countless early examples of the desire for jazz to “transcend” its social links with Black cultures, see Rogers (1925).

⁴² See also Jones (1963, 1967a); Levine (1977); Floyd (1995); Wilson (1983, 1992).

⁴³ Powerful voices include Gilroy (1993); Lewis (1996), Radano (2003).

understandings of difference, I nonetheless share Robin Kelley's (2000) hesitations about certain manifestations of "extreme antiessentialism" (xx). In other words, Blackness, though it is never stable, never firmly delineated or bounded, still carries palpable meaning and force. Put quite simply, my study proceeds on the presumption that "Blackness," like "Black music," while complex and variable, is a real thing, and it must be reckoned with as such. (I emphasize again that "real" does *not* mean that race has any connection to biology.)

At a fundamental level, I agree with Gerald Early and Ingrid Monson (2019), who "suggest that jazz improvisation remains a compelling metaphor for interrelationship, group creativity, and freedom that is both aesthetic and social" (9). Jazz has oppositional force, an emancipatory resistance, rooted in improvised sound and collective social action. Though not restricted to any racial or ethnic group, US Blackness is central to jazz's liberatory power. And this power, according to Early and Monson, materializes through sound—which they trace to an "acoustic power, representing the screams of Aunt Hester, as Fred Moten has put it, with the unconventional timbres and tones of haunting jazz" (9). What are these "unconventional timbres and tones," and what is their "acoustic power" to embody forces for resistance and freedom? And what does this acoustic power *sound like*? By referencing Fred Moten's (2003) now-classic exploration of "the screams" of the resisting slave as an originary gesture of black radical performance, Early and Monson are referencing one of the most energetic—and virtuosic—arguments for the *materiality* of black sonic performance as a resistant, disruptive force.

Throughout his dense and intellectually diverse text, *In the Break* (2003), Moten argues for an "irreducible materiality" at the center of Black sonic performance—which, to Moten, is *always* resistant, and *always* radical. Moten finds the founding "natal occasion" of this mode of performance in Frederick Douglass's famous description of his "birth" as a slave subject: the day

a very young Douglass, previously unaware of the true horrors of his bonded condition, witnessed his Aunt Hester's shrieking under savage torture. This shocking scene, and especially Aunt Hester's penetrating scream, becomes for Moten the foundational scene of Black performance. For Moten, Black performance is driven by the "freedom drive" embodied in this slave scream—the "originary performance" of Black resistance which is reproduced in every ensuing act of Black performance. An ever-present "material trace" of this resistant shriek "cuts" the most fundamental epistemological and ontological pillars of modernity: rationality, capitalist systems of value and possession, and conceptions of the autonomous human subject. Though Moten's position is by no means a simple racial essentialism, his project posits a shifting yet enduring formation of radical performance as phonic resistance—one that bonds Blackness, and Black resistance, across time and space.

For the current study, Moten provides a powerful avenue for pursuing the idea of sonic materiality and its resistant unintelligibility to western (white) frameworks. Moten affirmatively locates Black musical difference—and its resistant political force—in a physical sonic substance irreducible to musical or semiotic codes. Similar sentiments can be found in Amiri Baraka's positing of "the willfully harsh, anti-assimilationist sound of bebop," a sound Baraka contrasted, both sonically and socially, to "the cool timbre [that] was much more suitable for most white musicians, who favored a 'purity of sound,' an artifact, rather than the rawer materials of dramatic expression" (Jones 1963, 210). It is these "rawer materials"—or even the symbolic resonance of the very *idea* of a "rawer" sonic materiality—that provides much of the impetus for my focus on sound as a physical phenomenon.

Paradoxically, for hundreds of years similar kinds of sounds, and ideologies of sound, have buttressed racist characterizations of Black people and other marked others. Indeed,

associations linking excessive, uncontrollable sounds with Black and other marked bodies have been a common trope throughout hundreds of years of colonial and postcolonial history. As Ashton Crawley (2017) states, in the western world, “blackness is noise” (140). In this study, noise can be considered a flexible trope for a range of sonic characteristics that are deemed in hegemonic regimes of listening and meaning-making to be unintelligible, loud, unwanted, feared, or otherwise discordant. As countless commentators have noted, the sounds of Africans and Afrodescendants, like other racially marked others, have been historically heard by Euro-Americans in precisely these ways, becoming bound up with racial myths of Black bodies and people as excessive and irrational.⁴⁴

Documentation is found at least as far back as the 1600s, dispersed most notably in African travel narratives. According to ethnomusicologist Portia Maultsby (2015), “European travelers, missionaries, and other outsiders uniformly describe [African] vocal and instrumental timbres as ‘wild,’ ‘crude,’ ‘peculiar,’ ‘strange,’ ‘weird,’ and, more broadly, simply as ‘noise’” (8). Similar expressions were used to describe enslaved Africans in the New World. In terms that closely echo those Moten uses to describe the “freedom drive” of Black sonic performance, Maultsby quotes white listeners that were troubled by the “shrieks,” “screams,” and “groans”⁴⁵ they heard in Black musical performance (9). When Moten evokes these same words, he specifically mobilizes, for liberatory effect, their dissonance with western regimes of language,

⁴⁴ Like Moten, Crawley embraces various aspects of non-legibility within hegemonic western listening practices as an affirmative politics of sounding, celebrating, among other things, the “joyful noise” of various performance practices in Blackpentecostal worship services.

⁴⁵ These terms are pulled from historical first-hand accounts from white observers, which Maultsby pulls mostly from Dena Epstein’s (1977) influential study, *Sinful Tunes and Spirituals*—an invaluable source I have also read deeply in framing my study. Other secondary and primary sources I have consulted on the question of historical white listening to blacks sounds include the famous nineteenth-century compilations by John Pinkerton (volumes 15 and 16 discuss Africa; Pinkerton 1814a, 1814b) and Abrahams and Szwed (1983). Very useful analyses of noise and other forms of perceived difference are found in Radano (2003, 75-93; “noise” is discussed specially in 92-93).

rationality, capitalist accumulation, and the autonomous subject: in the very discordance of these sounds lies their power to “cut” post-Enlightenment modernity and assert Black resistance. But these same modes of performance have long underscored racial ideologies that restrict those bodies that produce such sounds from full modern humanity.⁴⁶

How do the sonic ideals I observed in my ethnographic research compare to the “material” or “noisy” aspects of sonic performance I’ve been discussing? Put simply, they are markedly different. The serene, acoustically isolated and scientifically objectified spaces of JALC can be interpreted as virtual temples to the power of high art to transcend the social and the power of science to manipulate sonic spaces to rationalized standards. While all my research confirms the sincerity with which JALC dedicates its activities to a vision of Black cultural excellence, my observations also reveal an unmistakable dedication to the project of western modernity. If Moten’s irreducible materiality is meant to disrupt the rationalizing codes of modernity, those same codes are found in abundance in much of the technological and aesthetic ideals I observe. This dissonance drives this dissertation.

Yet I must emphasize that I use the word dissonance carefully, because I do not wish to imply a blunt logic of opposition or exclusion. So, when I claim that rationalized, pure and clean sound attenuates the liberatory force of certain aspects of jazz performance, I do not mean that such sonic regimes entirely *preclude* the kinds of oppositional Black material performance I have been discussing (nor does it preclude racist stereotyping). That is, Black music’s “rawer materials” (Jones 1963) are not excluded from the spaces of performance I discuss—at least not

⁴⁶ I have presented here only a few of the many powerful arguments that have advanced sonic characteristics—and specifically those irreducible to western musical logic—as markers of human difference. The sounds of black bodies—and the interpretive listening of such sounds, whether “musical” or otherwise—have long been signal markers of difference. Particularly relevant works include Smith (2001, 2006); Radano (2003, 2016); Radano and Bohlman (2000); Crawley (2017); Jones (1967a); Cheng (2018); Rose (1994); Stoeberl (2016a); Europe (2015).

entirely. Indeed, at JALC in particular, one *does* encounter a range of musical techniques that fit with this model of sonic expressiveness. Marsalis and other performers at JALC regularly deploy grunts, screeches, hollers, growls, and any number of other “extramusical” techniques long associated with Black musical expression. It is impossible not to acknowledge the clear shared genealogy these and other techniques share with Moten’s Black radical aesthetic—even if the “radical” moniker is not something either Moten or Marsalis might ascribe to the music most often performed at JALC. Moreover, JALC promotes master tropes like blues and swing specifically for their Black cultural specificity, and while these tropes are largely deployed as models of elegance and distinctiveness—as well as assertions of unacknowledged Black cultural values in the *mainstream* of US culture—they are nonetheless irreducible to the codes of scientific rationality and western aesthetics I discuss throughout this dissertation. Furthermore, though I support the argument that an inherent resistant power—even a radical energy—exists within the “haunting sounds” of certain “material” soundings, I do not wish to imply that such sounds are required aspects of authentic Black performance, or that they are the only way to be radical or antiracist.

All this is to say that while I do argue that the sonic regimes discussed in this dissertation *attenuate* and *complicate* jazz’s oppositional energy, I do not make any sweeping judgments about the overall effectiveness of projects like JALC’s. It is remarkable that JALC has maintained the level of Black leadership it has, both in its artistic content and in its choice of leaders, in a US high-art landscape that is still overwhelmingly white. At the same time, I do argue that we cannot properly understand or assess musical or political projects like JALC’s without accounting for the entanglements with the pillars of western modernity that I discuss.

And to reckon with such entanglements requires engaging with the *way jazz sounds*—beyond its “musical” or “discursive” content.

0.10. On Colorblindness, Whiteness, and the Arts and Sciences

A particularly important concept that ties together western aesthetics, technoscientific rationality, and the sound of jazz is colorblindness—as is the closely related concept of whiteness. While colorblindness has apparent value as a principle of nonracial thinking, it too often functions to stifle social justice through deflection (see, e.g., Crenshaw et al. 2019; Bonilla-Silva 2014; Omi and Winant 2015). As Naomi Murakawa (2014) writes, “If the problem of the twentieth century was, in W. E. B. Du Bois’s famous words, ‘the problem of the color line,’ then the problem of the twenty-first century is the problem of colorblindness, the refusal to acknowledge the causes and consequences of enduring racial stratification” (7). Colorblindness mobilizes a logic of neutrality and transparency to construct societal structures and epistemological frameworks in ways that seem impartial but in fact reinforce existing systems of oppression. Both colorblindness and the whiteness it protects are technologies of deferral, and both rely for their existence on myths of transparency and neutrality. They distract and divert the moral imperative to redress past and present racism, and they thus support the continued material and symbolic supremacy of whiteness and the people that benefit from it. As Kimberlé Crenshaw states, colorblindness “immunize[s] the racial status quo against any substantive redistribution” (1998, 282). Or, as George Lipsitz (2019) writes, “colorblindness constitutes a core component of a long-standing historical whiteness protection program” (24).

I wish to explore the intersections between the presumed neutrality of colorblindness and analogous pretenses of transparency and autonomy observed in the technological mediation of the sound of jazz.

Colorblindness threads through various streams of jazz history, most notably through the discourse of jazz as a high art. Jazz-as-art narratives construct jazz as an autonomous art modeled on western ideals, one which has progressed beyond its supposedly humble beginnings to gain institutional support, an established historiography, a body of western-style theoretical analysis, and, perhaps most important, an established canon of “great” artists and works. Along with this high art status has been a presumed shift from jazz as an “ethnically particular” form privileging African American people and cultures toward a colorblind notion of jazz as universal and accessible to all.⁴⁷

Assertions of jazz as colorblind art carry important positive consequences. Among other things, they repudiate age-old racist myths of Black musical authenticity as “natural,” “instinctive,” and overtly sexual. Jazz art narratives have also challenged the still-prevalent racist associations of Blackness with the body and whiteness with the mind. And, especially in a US context, this storyline has placed a Black-derived music in the center of the national cultural narrative, proffering, among other things, the idea of jazz as “America’s Classical Music” and a widespread acceptance of jazz as a cherished US cultural export (Moreno 2016). Since its formation, Jazz at Lincoln Center has been perhaps the most famous—and most criticized—representatives of this trend.⁴⁸ Taken by themselves, these are important and laudable accomplishments, even if problematic in many ways.

⁴⁷ As Radano (2016) states, by making jazz a “high art,” and basing such a move on European classical models, jazz’s links to racial identities changed dramatically. He states, such moves “typically relied on an integrationist rhetoric that sought to position jazz within the realm of the European classical tradition, and, in so doing, they tended to assimilate blackness into whiteness” (435).

⁴⁸ See, e.g., DeVaux (1991).

Indeed, I share the concerns of many observers that ideologies of colorblindness in jazz can attenuate the “ethnocentric energy” (Ramsey 2003) that has long provided jazz with much of its invaluable transgressive and emancipatory power (Monson 2007; Jones 1963, 1967c; Ramsey 2004; Floyd 1995; cf. Radano 2003).⁴⁹ And I share concerns over parallel losses of Black privilege and aesthetic distinctiveness (Monson 2007; T. Jackson 2012; Panish 1997; Jones 1967b). Reducing such privileges entails wide-ranging material losses—opportunities for employment, recording revenue, etc.—for Black people in the aggregate while, in the aesthetic realm, attenuating jazz’s legibility as a mode of expressing Black sonic particularity. I aim to add new dimensions to these conversations by exploring the role of technology and sound in jazz’s relations to colorblindness and the whiteness it protects.

0.11. Chapter Summaries

While questions of jazz’s relations to race, difference, and sound technology are the primary political (and intellectual) motivations for this study, my arguments on these problems take a while to develop. All of my chapters address such questions to some degree, but much of the earlier pages lean more heavily into the other two of the three main purposes of this dissertation: (1) to understand live jazz performance with more attendance to technology, its operation, and the creative and material labor of technicians and others who interact with it and (2) to take seriously the participation of nonhuman objects and artifacts in the ontology of sonic performance. In the big-picture structure of this dissertation, it is necessary to explore in the earlier chapters how the rooms actually sound, how the technology works, and what my

⁴⁹ Also, among other things, high art has been deployed as an assertion of full citizenship as modern subjects. See, e.g., Monson (2007).

interlocutors think about its use so that I can develop the more politically oriented claims as the arguments progress.

Chapter 1, “‘Some Rooms Make You Shout’: Physical Acoustics and the Sound of Jazz,” establishes some of the main themes of the dissertation. It argues for rooms, and their physical acoustic characteristics, as registers and contestants of musical judgments. The central category of technology in this chapter is architectural acoustics: the patterns of physical vibrations in a room. The primary ethnographic site for this chapter is JALC’s Rose Theater, where I find the most focused crystallization of what JALC believes to be “the sound of jazz”—and how it is encoded into “jazz steel.”

This chapter shows how space itself, as constructed with real, physical matter, can be recruited into an ideological project of *defining jazz*—a project that JALC has embraced as a central part of its mission. To understand how this actually works in a physical, material sense, I show how an array of acoustical characteristics—including reverberation time, frequency response, and early reflections—encode musical and social values into the room’s architectural structures. Together, these and other physical properties do much to construct rooms as impactful participants in live performance.

According to a key interlocutor, Rose Theater “responds well” to some sounds and not very well to others (D. Gibson, pers. comm., March 29, 2019), a dynamic that reveals the room itself as both agentive actor (or collection of actors) and a humanly shaped artifact through which ideas about musical genre are inscribed.

The main ethnographic examples are two contrasting performances. The first is the Jazz at Lincoln Center Orchestra, a repertory big band for which the room was built, thus providing a template for what “the sound of jazz” means for JALC. This group performs with almost no

amplification and the audio crew has to do comparatively little to make the show work. In contrast, I offer the chapter's other main ethnographic example: a concert by bassist Marcus Miller with an all-electric band, titled "Electric Miles." I document various ways the room doesn't respond well to the band's comparatively loud, low-frequency-heavy sounds (compared to the JALC ideal), necessitating more labor from stagehands, more architectural/technological adjustments, and additional adaptations from the musicians.

In recounting how the room actively responds to musical sounds—prompting further actions from networks of humans and nonhumans—I aim to provide what Bruno Latour (2005) calls a "good account," one which "traces a network" of those exceptional moments when confederations of human and nonhuman actors reveal their influence. Throughout this dissertation, I craft ethnographic observations of assemblages of objects to help "*make them talk*, that is, to offer descriptions of themselves, to produce *scripts* of what they are making others—humans or non-humans—do" (2005, 79). In this chapter, the room and its technologies "talk" quite a bit, prompting a conversation about JALC's complicated overlapping of western classical musical aesthetics with their particularistic interpretation of Black expressive culture. And, not unimportantly, a pointed resistance, traced directly to Wynton Marsalis's tastes, to electric instruments, electroacoustic technology in general, and various "fusion" constellations in jazz.

In chapter 2, Rose Theater also "talks," but in this case, it speaks at a much lower volume. Titled "'Some Rooms Make You Whisper': The Art of Isolation and the Racial Politics of Quiet," chapter 2 focuses on the elaborate ways that Rose Theater is acoustically isolated from its surroundings and how an environment of quiet appreciation is fostered in line with JALC's aesthetic/ideological goals of asserting jazz as a "high art" in the western mold. Paradoxically, while JALC's geographical location is at the heart of a major metropolitan center, a fact that the

organization deploys to powerful symbolic effect, the phenomenological experience of jazz in Rose Theater is dramatically sequestered from New York’s sensorial environment. Put simply, Rose Theater is *really* quiet—to a degree rare even in the most revered classical halls.

Rose’s extraordinary sonic isolation is accomplished through a rare and expensive “box-in-box” construction that physically disconnects the hall from any vibratory connection with the rest of the material world.⁵⁰ This fosters an uncannily quiet, isolated environment specifically designed to separate the musical experience from the “noisy” social world outside the theater’s walls. This sonic environment is specifically designed to assert jazz as an autonomous art suited for attentive listening and somber contemplation. This is more than symbolic: I document numerous ways this acoustic isolation actively conditions human behavior, encouraging “pure listening” (D. Hosney, December 19, 2016) and discouraging audible “distractions.”

I also explore the political nature of this quietness, arguing that by creating an exceptional sonic space distinct from the disordered exterior sound worlds, this aural environment is meant to counter racist tropes that have long linked Blackness, Black bodies, and Black spaces with various forms of “noisy” sonic excess. Among other things, Rose Theater’s sonic environment is recruited into Marsalis’s desire to extricate jazz and jazz musicians from common stereotypes of “smoky jazz clubs” and “the rebel thing” as signal attributes of jazz authenticity (pers. comm., April 13, 2019).

I agree that these and other stereotypes of Black authenticity are restricting and racially destructive. But I find that JALC doesn’t simply emancipate jazz from particularity; it aligns the

⁵⁰ As I explain in more detail in chapter 2, the whole theater is built within a massive concrete-and-metal box stabilized in the air by cables and gently resting on hulky neoprene pads. At least four inches of air separate this box on all sides from any rigid connection to the building or the rest of the world.

music with *another kind* of particularity. Indeed, I show how the sonically isolated environment fostered at Rose Theater fixes the music and those who listen to into a particular framework of musical value—emphasizing complexity and nuance—that is aligned closely to a western concert hall tradition that is anything but universal.

Chapter 3, “‘Make Yourselves Invisible’: Transparency, Fidelity, and the Illusion of Natural Sound,” begins a transition away from physical acoustics toward electroacoustic technology. This chapter demonstrates how sound reinforcement at JALC is guided by principles of fidelity and transparency, two terms I interrogate considerably. In much the same way the cultivated quietness discussed in chapter 2 aligns with JALC’s desire for distraction-free, “pure listening” (D. Hosney, pers. comm., December 19, 2016), JALC deploys sound reinforcement to foster a “pure and clean” aural environment based on the illusion of a “natural,” technology-free sonic experience. A central irony is how this illusion of acoustic purity is approached with an array of technological systems and practices. Indeed, the carefully curated impression of an acoustic experience at Rose Theater emerges from a vibrant overlapping of mechanical vibrations, amplified waves, physical human bodies, and incalculable other material objects.

This chapter also brings the narrative toward Meyer Sound Systems. I introduce two primary interlocutors, Bob McCarthy, the towering figure in sound system design, and John Meyer, founder and CEO of Meyer Sound Systems. Together, these men serve as excellent guides to understanding the avowedly “scientific approach” that is unique to Meyer Sound’s “culture” of sound (J. Meyer, pers. comm., April 26, 2019), which is reflected strongly at JALC. I emphasize how Meyer Sound—and these two men in particular—has ardently propagated the ideal of sound reinforcement as a neutral, “blank canvas.” Rejecting the concept of “good sound,” Meyer Sound has famously embraced the goal of “same sound.” Put simply, sound

systems should not enhance, impair, or otherwise alter any sound signal in its path, but should instead clinically, objectively carry that signal unchanged from point A and point B.

Meyer's preferred term for describing this philosophy is "linearity." Linearity, or "accuracy" (a serviceable synonym), is essentially a more mathematically rigorous concept for thinking about what in less technical discourses is referred to as fidelity. Fidelity also highlights correspondence between two things, but it evokes broader notions of "original" and "copy" that are harder to pin down technically. A relation of fidelity entails the production of copies faithfully reproducing an original that precedes the relation itself. Fidelity thus connotes an authentic connection to unmediated experience

At JALC, this unmediated experience is found in a sonic ideal of an acoustic, technology-free experience, but one in which the music's details can be heard by listeners in a way that would never be physically possible *without* amplification. This chapter not only uncovers the conceit of constructing an illusion of fidelity to an acoustic "original," but introduces entirely new ways of theorizing the concept of fidelity itself.

My fourth chapter, "Tuning the Room: On the 'Arts' and 'Sciences' of Sound and Space," is the most technologically complex in this dissertation. I dig deeply into what makes the approach at Meyer "scientific." Considered on its own, the chapter's main purpose is to analyze Meyer Sound's unique approach to "tuning the room," their distinctive practice of optimizing and calibrating rooms and sound systems for neutrality, evenness, and controllability. Using high-tech instruments and scientific methodologies, tuning the room posits ontologies of sound and space as autonomous objects of disinterested observation and mastery. As part of the broader argumentation of this dissertation, this chapter provides the groundwork for many of the claims of chapter 5, which focuses on how the objectification of space described in chapter 4, articulate

the sound of jazz into epistemological legacies aligned with whiteness and gender oppression. Chapter 5 will also argue how these spaces are also designed for efficient alignment with capital accumulation, which involves ideals of clarity, neutrality, and rationality discordant with certain ideals of Black cultural expression.

These key chapter 5 arguments require that I first detail how these spaces are actually constructed. Chapter 4 illustrates in detail Meyer Sound’s commitment to a philosophy of sound deeply invested in the capacity of science and technology to objectively measure and control sound and space as autonomous objects. This philosophy is encoded most dramatically in two analytical objects: (1) Meyer’s famous audio analyzer, called SIM, and (2) their methods of using SIM to measure and calibrate sound and space. They call this latter process “tuning the room,” an “objective pursuit” (McCarthy 2010) aimed at constructing a rationalized sonic space as a neutral, “blank canvas” with “the same sound everywhere” (B. McCarthy, December 13, 2018). Like so many things about the Meyer philosophy, tuning the room is structured around a central metaphor, the “art/science line,” a term that comes up a lot in everyday conversations and technical documents.⁵¹ This figurative line marks the boundary between Meyer’s work and philosophy, which they consider *scientific*, and the methods of other people and groups they consider the realm of the subjective and creative. I show how this boundary is dramatized both in Meyer’s overall philosophy of sound and in the technological artifacts themselves.

Yet, despite the incredible investments in notions of distanced objectivity, my ethnographic observations also show a much messier reality “in the field”—as my interlocutors describe the material practice of room tuning. Through close analysis of a few dense

⁵¹ See, e.g., McCarthy (2016).

ethnographic moments during room tunings at the Montreux Jazz Festival, I show that the actual implementation of Meyer’s “scientific” techniques and technologies can be a contested affair in which human operators must negotiate with a constellation of nonhuman agencies. Indeed, though sound system tuning is supposed to be “an objective pursuit” (McCarthy 2010), on the ground, the process is highly relational and interactive, a complex negotiation between humans, machines, and all manner of nonliving objects. Sometimes these nonhuman things do what they’re expected to do, and sometimes don’t. At various times during the tunings I observe, sound and technology resist human attempts at control, expressing their own participation in the process of calibration. At times, sounds and technologies *direct the action*, drawing human bodies to certain places in the room, prompting them to listen in unexpected ways, and even posing questions to human operators. In a way, this “complex choreography of matter” (Coole and Frost 2010, 9) participates actively in contested conversations that result in palpable, unexpected changes to how these rooms end up sounding.⁵²

As mentioned, chapter 5 builds on chapter 4, investigating how overtly technoscientific approaches to sound reinforcement are connected to some unexpected epistemological lineages. The first half of the chapter builds on sound studies and feminist antiracist science studies to show how pretenses of accessing sound and space as “properly ontological” (Henare, Holbraad, and Wastell 2007, 4), culture-free realities transcending representation align the sound of jazz with epistemological regimes of whiteness and Man. Here, as elsewhere in the dissertation, whiteness is not an indicator of biology or firm cultural stability—and it is always

⁵² I don’t mean to imply that because I reveal a “messy” ethnographic reality on the ground that the things I observed were any less “scientific” than what goes on in any other laboratory or other scientific setting. As numerous works of science studies—some of them quite canonical—have argued, scientific knowledge has always been a more contingent, materially mediated affair than it often seems on paper (see especially Latour and Woolgar 2013; Shapin and Schaffer 2011; Haraway 1988, 2018, 2006; Traweek 1992; Mol 2002; Law 2004; Fleck 1981).

overdetermined by gender and other modes of difference—but a complex articulation of forces with epistemological, political, and, as I demonstrate throughout this study, *sonic* dimensions.

In the second half of chapter 5, I analyze how the rationalization of sonic space reveals underlying entanglements with what Lipsitz calls a “white spatial imaginary,” an ostensibly neutral environment that subtly benefits priorities aligned with whiteness. Such spaces also preempt the oppositional, counter-hegemonic potential of jazz and other forms of Black sounding. I draw on Matt Sakakeeny’s (2010) ethnography of the “joyful noise” of New Orleans street parades, an exhibit that starkly contrasts cultures of sounding and listening at JALC.

Chapter 1: “Some Rooms Make You Shout”: Race, Acoustics, and the Sound of Jazz

“This room doesn’t respond well to loud electronic sound,” David Gibson tells me. Gibson is the head sound engineer at Rose Theater, the celebrated 1,300-seat concert hall at Jazz at Lincoln Center’s (JALC) multi-venue facility in New York City. I am in the middle of eight months of fieldwork embedded with Gibson’s crew—part of a three-year ethnographic project investigating acoustics and audio technology at JALC and other jazz venues. It’s about 11 a.m., and Gibson’s crew of audio stagehands, fresh off morning coffee break, hustles to load in and set up all manner of road cases, amps, instruments, cables, and other equipment for tonight’s concert by electric bassist Marcus Miller. Gibson surveys the bustling room as his five-person crew scrambles to get everything in place for the afternoon’s sound check and the evening’s show. Miller’s ensemble performs almost exclusively on electric instruments, all heavily amplified. Rarely is such a magnitude of electronic hardware found into this room—anywhere else in any of JALC’s performance spaces—and as I watch the piles of gear build up on the stage, a weighty air of uncertainty pervades the room. Gibson, like all the other technicians consulted in my research, knows that Miller’s style of music—and the way it’s amplified—is a poor acoustic match to this space. The room “doesn’t respond well.”

This chapter explores what it means for a room to “respond” to sounds, and what human values and judgments are involved in designing a room that responds well to some sounds but not to others. I show how rooms, through their manifold acoustical attributes, mediate a range of social and musical meanings and relations, some of them purposefully enacted by human designers, and some of them emerging from a range of emergent human/nonhuman interactions.

A crucial analytical axis is the concept of genre—and specifically the many contestations, historical and contemporary, over jazz and its definition. While the construction of jazz is usually discussed in terms of written discourse (historiography, music criticism, etc.) or canons of musicians, performances, and recordings, I propose closer attention to the built environment as a modality through which jazz’s musical and nonmusical attributes are negotiated.

Rose Theater and JALC are especially well-suited objects of analysis for this inquiry, most notably because JALC has profusely proclaimed that the hall was purpose-built “specifically for the sound of jazz.”¹ Indeed, unlike the countless other spaces where jazz has been played—indoor clubs, symphony halls, outdoor festivals, and so forth—all of JALC’s performance spaces were purpose-built with jazz music in mind. But designing a room for the sound of jazz necessarily entails making corresponding assertions about what jazz is in the first place. Indeed, as I argue in this chapter, by designing spaces for the sound of jazz, the designers of the JALC performance spaces enact claims about what jazz is—which kinds of musical styles and sonic characteristics qualify as jazz, and which do not. These characteristics are encoded into the very physical matter of the rooms and other spaces that constitute JALC as an assemblage of material artifacts.

JALC has been energetic in promoting its own values and judgments about jazz, wielding a powerful voice in debates about what jazz is, what its cultural meaning should be, and what role it should play in the cultural and political life of the United States (and, to a lesser extent, abroad; see, e.g., Moreno 2016; Laver 2014). JALC has been unapologetic about posing definitive pronouncements about what musical styles and extra-musical behavior should count as

¹ This quote is reproduced in many journalistic accounts (e.g., Ratliff 2004; Marsalis and Fierce 2004; Doria 2005).

jazz and what, in contrast, is either too commercial, too electric, or too eccentric to deserve that moniker (see, e.g., Milkowski 2000; see also Marsalis 1988). JALC's prominent role in contestations over the meaning of jazz heightens the significance of questions about physical rooms as mediators of meaning and experience. The Marcus Miller example, which I analyze in depth below, prompts especially revealing interpretive problems. For, if Rose Theater was designed for "the sound of jazz," what does it mean that the room does not "respond well" to sounds of the Marcus Miller ensemble? How does the sound of the room shape or contest claims of Miller's music to be jazz? And what does this mean for "electric sounds" or any other sonic materials to which the room doesn't "respond well"? More broadly, how do the room and its acoustical responses shape the way the institution conceptualizes and promotes jazz? And, what can we learn about what any room can say—or do—about the question of what jazz is? Or, for that matter, any other musical genre?

Exploring these questions will point toward new ways to think about how the architectural acoustics of music venues enact, in material form, values and judgments about musical style and genre, while at the same time challenging and expanding on ideas of live performance as a humans-only affair. By mediating musical and extra-musical sound, the room itself, through its distinctive ways of shaping mechanical vibrations, registers an array of social values and shapes social action. Most specifically, I reveal how the materiality of acoustic sound, and how it is conceptualized and conditioned, is deeply entangled with symbolic meanings and affective feelings of racial difference. I thus reveal new ways to think through problems that have long been crucial to understanding jazz and other sonically "marked" musical forms. Building on scholarship from jazz studies, science and technology studies, human geography, and new materialism, this chapter opens up new ways to think about how acoustic architecture, and the

sonic behavior it conditions, mediates the symbolic, political, and affective valences of racial difference as filtered through negotiations of musical genre.

1.1. “Jazz Steel”: Matter, Materialism, and Institutions

Since late 2004, Jazz at Lincoln Center has occupied a purpose-built \$125 million facility perched five floors above New York’s Columbus Circle, nestled between the two skyscraping towers of the Time Warner Center. In 2001, shortly after breaking ground on the new complex, Wynton Marsalis gave an extended interview to *New York Magazine*. At one point, strolling around the construction site with the interviewer, both donning hard hats, Marsalis paused to ruminate:

“Jazz steel,” Wynton notes, clutching a naked girder as the late-fall wind whips through the open superstructure. It is a phrase he likes, “because we’re not after something that is going to disappear. We’re building an institution.” That’s what people don’t understand, Wynton says—the need for permanency. (Jacobson 2001)

What could more aptly encapsulate the entanglement of music, politics, and physical matter than the notion of “jazz steel”? For Marsalis, the whole facility, down to its barest structural core, is meant to embed the supposed impermanence of improvisation and “swing” into the raw and durable built environment. “It’s powerful symbology,” Marsalis told me. “It means *this is important*. It’s not an afterthought” (pers. comm., April 13, 2019). No longer transient or peripheral to American culture—a longstanding grievance for Marsalis and his intellectual cohort—jazz becomes literally durable, and very tangibly a “thing.”

With a now-iconic panoramic vistas gazing over the East Side skyline and Central Park, JALC’s prime real estate and affluent facilities—surrounded by luxury apartments, boutique restaurants, a five-star hotel, and a high-end shopping mall—elegantly encapsulate the institution’s overlapping enmeshments with contemporary capitalism. To those who view jazz as a transgressive expressive culture more suited to basement clubs or bohemian loft spaces, such

an alignment with blatant commercialism may be distasteful. As Lorraine Gordon, long-time owner/manager of the Village Vanguard, stated, “I love Wynton, he’s the best. But jazz in a shopping mall? What’s that about?” (in Jacobson 2001).

JALC and its leaders, acutely aware of jazz’s precarious position in the commercial landscape, are famously deft at navigating the worlds of business and nonprofit sponsorship. As the “corporate headquarters” of jazz (Greenland 2016, 70), JALC has fostered an unrivaled network of private and public sponsorship, amassing a \$60 million endowment and over \$200 million in net assets (Vincent 2020). Among its many activities, JALC hosts well-attended concert series in its three performance venues. In addition to Rose Theater, JALC’s 1,233-seat flagship, the facility also includes the 483-seat Appel Room and the 140-seat Dizzy’s Jazz Club. JALC also sponsors the most well-funded and widely deployed educational efforts in jazz, offering all manner of classes, workshops, and after-school programs, both in New York City (on the JALC premises and throughout the city) and across the country.

JALC has wielded an outsize voice in the most heated controversies in the US jazz world, often sustaining considerable criticism. Adopting a pointedly canonical, conservative posture in its musical programming (Gray 2005), JALC has reinforced a “heroic narrative” (Lipsitz 2004, 23) of jazz history, extolling a select cadre of historical legends that reinforce Marsalis’s aesthetic and historiographical articulation of “real jazz.”² JALC has been known for being less than fully hospitable to the more experimental currents in jazz and other forms of Afrological improvisation, as well as a spectrum of electrified “fusion” jazz styles (discussed further below). Like others, JALC celebrates jazz as a triumphalist metaphor for US democracy—one in which

² Though the spirit of the “real jazz” is sometimes implied, Marsalis has used and defended the term “real jazz” on many occasions (e.g., Panken 1997; Scherman 1995; Marsalis and Stewart 1994; cf. Crouch 1990).

an oppressed people overcame a racial identity imposed upon them to ultimately lead the country into new and more swinging modernity.³ Emphasizing tropes of elegance and cooperation-through-conflict, musical concepts like “swing” and the “blues” are framed not only as required musical attributes of a jazz aesthetic, but also as master tropes for an ideal (African) American life of dignity and style.⁴

By asserting Black leadership at the heart of US cultural life, JALC has been a prominent voice in conversations over how Black cultural production is viewed and hierarchized within the US racial order. Championing a vision of jazz as high art, JALC has consistently challenged some of the stubborn racist myths about the sounds of Black Americans. Though certainly not the first powerful voice to assert the uplifting potential of jazz-as-art, JALC has claimed a distinctive position of cultural leadership, not least through its association with Lincoln Center and that organization’s preeminence in Eurocentric art worlds. And by pointedly placing Black musicians at the forefront of the project, JALC has been a positive force in challenging certain aspects of the US racial imaginary. Even some of JALC’s and Marsalis’s most resounding critics have acknowledged that the organization’s successes have been “remarkable by any standard” (Heble and Wallace 2013, 13), by interjecting the culture of a historically and presently oppressed community into the heart of US modernity (see also Baraka 2009; Broecking 1995 quoted in G. E. Lewis 2004).

³ See, e.g., “Let Freedom Swing” (n.d.). For discussions of efforts by JALC and others to mobilize the democracy/jazz connection, see Maxwell (2004); Monson (2007); Jankowsky (2016); Murray (1976); Ellison (1972); Sanchirico (2015); Givan (2021); McMullen (2008); Gracyk (2002).

⁴ Especially important texts representing this general mission include Murray (1976, 1970); Marsalis (1986, 1988); Marsalis and Stewart (1994). Illustrative interviews include Scherman (1995); Norment (1994).

But while JALC has challenged many racist myths about Black inferiority, claiming considerable cultural and symbolic capital for Blacks in the US cultural hierarchy, critics have noted a range of concerns. One prominent critique scrutinizes how JALC’s “neoclassical” project denies legitimacy—and thus essential symbolic and material benefits—to perspectives, social groups, and aesthetics that don’t align with Marsalis’s vision of the “jazz tradition” (G. E. Lewis 2004; Porter 2002; Radano 1993; McMullen 2008).⁵ Among other things, this vision of the jazz tradition has attenuated many of jazz’s progressive and politically oppositional aspects (Jones 1963; Monson 2007; Fischlin, Heble, and Lipsitz 2013) proffering a distinctive brand of US exceptionalism that downplays the music’s rich involvement in the transnational exchange of culture and ideas (Atkins 2003; Bohlman and Plastino 2016; T. Jackson 2016; Washburne 2020). JALC has been further critiqued as entangled with the logics of US imperialism (Moreno 2016) and the colonialist power structures of global capitalism (Chapman 2018; Laver 2014). A still under-addressed issue has been JALC’s construction of jazz and its history through the lens of a “primarily male collective identity,” where women are often treated as outsiders or special cases (Rustin and Tucker 2008, 5; McMullen 2008; Teal 2014; Jacques 2001; cf. Monson 1995; S. Tucker 2008, 2000). While I do not rehash these critical conversations here, I illustrate novel ways to investigate how such problems are negotiated not only in words and music but in the physical materiality of sonic performance—and the “jazz steel” of the built environment.

⁵ Not only do more “experimental” forms of improvisational musicking find themselves deprived of the valuable institutional and cultural capital of inclusion in the genre label “jazz”—a label JALC has spent considerable resources defining in its own image. And by asserting so much discursive power in defining “what jazz is—and isn’t,” as Marsalis (1988) once wrote, the organization has continued to influence the all-important questions of who gets the gigs, performance opportunities, and other business opportunities

Throughout the design and construction process, Marsalis was adamant that JALC's new home should be just as impressive as the facilities built for other constituents of the Lincoln Center organization. As Mark Jacobson (2001) writes, recounting an interview with Marsalis, "There was no reason, Wynton said, no reason at all, that jazz, America's 'greatest art form, a democratic triumph of order and beauty over chaos,' shouldn't be accorded the same status as 'European' Lincoln Center constituents' like the Metropolitan Opera, the New York City Ballet, and the New York Philharmonic." Marsalis has taken exception to how jazz has been forced to adapt to spaces meant for entirely different purposes while classical musicians and groups have long enjoyed halls designed to suit their particular aesthetic characteristics (see E. A. Thompson 2002; Beranek 2004; Schwenke and Ellison 2010; Eidsheim 2015). To erect a purpose-built facility for jazz, then, was fundamental to Marsalis's longstanding mission to assert for jazz the "same respect" (G. E. Lewis 2004, 86) as classical music.

By constructing the new complex, JALC claimed significant cultural and political capital both for itself as an institution and for the vision of jazz it champions. At its new residence, jazz was made to lie materially and symbolically at the center of the American metropole, thus holding a pivotal space in the cultural imaginary of "the West." With a purpose-built physical home, JALC rendered jazz as a stable object of capital and political investment, endowed with a solid, material permanence.

These were far more than symbolic achievements. According to sociologist Thomas Gieryn (2002): "Buildings stabilize social life. They give structure to social institutions, durability to social networks, persistence to behavior patterns" (35; cf. Dovey and Dovey 2010). By patterning spatial experience, buildings make certain practices more possible than others, certain meanings more influential—and in this way "the interests of powerful voices in the

design process are etched into the artifact itself” (42). At JALC, I am interested not only in how powerful voices inscribe their judgments about jazz into “jazz steel,” but how these inscriptions are revealed *in sound*. The first step in this inquiry is to ask, what does “jazz steel” sound like, and what are the consequences for human and nonhuman social behavior? To proceed, it is necessary to first examine—or, better, *imagine*—what actually happens, on a material level, when a room responds to sound.

1.2. “The Golden Tail”: Acoustics for the Sound of Jazz

When an instrument stops playing, a voice stops singing, or an audience member stops clapping, the sound doesn’t simply disappear. Vibrations first emanate from the sound source in all directions, in all three dimensions. Imagine arrows pointing from a musician pointing up, down, left, right, and everything in between, each one representing a linear emission of compressions and rarefactions that we call acoustical “sound” in air. One arrow travels in a straight line to the listener’s ears. We call this the *direct sound*, and it always arrives earliest and loudest. The waves represented by all the other arrows will either dissipate in the air or encounter one of the countless solid bodies in the room—walls, chairs, musical instruments, human bodies, and so forth. Some of these waves will be entirely absorbed, while others will be reflected on a new path. Most will be only partially absorbed, allowing an attenuated remnant of the original sound to continue on—now with a modified sonic profile. Many of these surviving waves will meet another solid object, which will, like before, either absorb them or reflect them on a new course.

A particular array of reflections will encounter exactly one reflective surface between the source and the listener. These are called *early reflections*, *first reflections*, or *early energy*. For each emission of sound, and each listener, there is an array of early reflection paths: one path

might bounce off a particular place on a wall before going to the listener, another might bounce off the ceiling, and so on (Figure 1.1). Since each of these paths take a different route to the listener, each will arrive at the ears at a different time, and at a slightly different strength. The brain processes these minute differences, including variations between the left and right ears, into spatial perceptions, allowing listeners to aurally locate a sound source in space or get an unconscious feeling for the size, shape, and general acoustical affect of the room and its occupants.

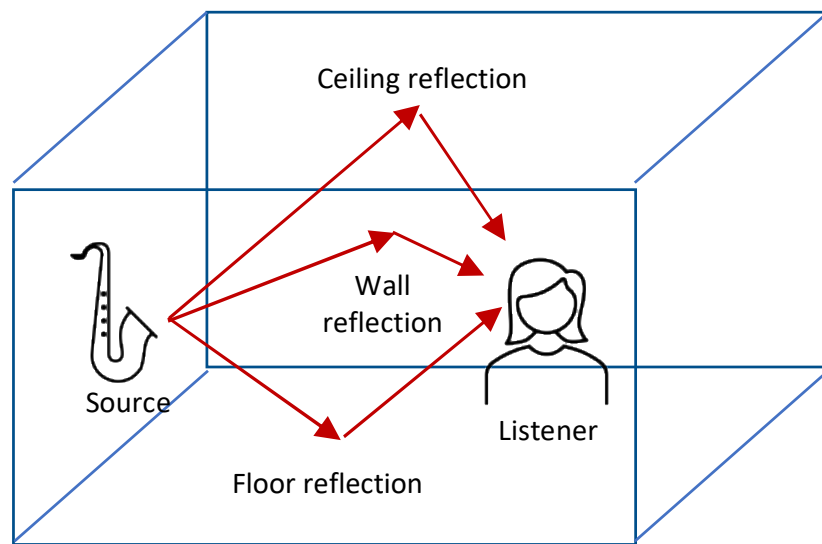


Figure 1.1: Potential early reflections

Many more waves only arrive at the ears after a much more circuitous journey, having reflected off surface after surface, accumulating into a “tail” of lingering sound we call *reverberation* (also commonly referred to as “late reflections” or “late energy”). When someone speaks of the “sound” of a room, reverberation is usually the most important acoustical factor—which makes sense, considering you can actually *hear* reverberation. In contrast, early reflections arrive at the listener’s ears so soon after the direct sound that they are essentially indistinguishable from the sound source itself, even if they provide crucial unconscious aural feelings. Reverberation sustains an original sound for a consciously perceptible length of time—

a period quantified as *reverberation time* (RT) and usually described in seconds and fractions of seconds—in contrast to early reflections, which by definition arrive in the first 80 milliseconds after the direct sound (Beranek 2004).⁶

Reverberation gives listeners a sense of whether space feels “dry” or “dead” (little reverberation) versus “wet” or “alive” (a lot of reverberation). Reverberation may convey a sense of “participation from the room” or “energy” (J. Uhl, pers. comm., January 20, 2017). It can provide a feeling of “intimacy” (D. Hosney, pers. comm., December 19, 2016; Beranek 2004) by establishing an affect of vibratory proximity between listeners and the material environment (early reflections do this too). More generally, reverberation provides the core “sonic signature” (E. A. Thompson 2002) or “aural architecture” (Blessner and Salter 2007a) of a particular space. Indeed, reverberation is often referred to simply as the “sense of space” itself (e.g., Beranek 2004; Blessner and Salter 2007a).

What sonic signature did JALC’s decision makers desire for their performance spaces? The most dominant ideal was what Marsalis calls “the golden sound of jazz,” a master trope for both the music’s essential sonic aesthetics and the ideal acoustic environment for its performance (Marsalis and Fierce 2004).⁷ Along with cognate terms like “golden tail” and “golden bloom,” the poetic if cryptic notion of a “golden sound” was a primary mission objective for all the technicians tasked with designing Rose Theater’s acoustics. Which is to say that everyone knew

⁶ Some acousticians use 50 milliseconds as their definition; see D. Doria (pers. comm., April 8, 2019).

⁷ These terms appear commonly in my interview transcripts and press accounts. See, e.g., Marsalis and Fierce (2004); Artner (2002); Doria (2005); Gallo (2004); Reich (2004); Hinckley (2004); W. Marsalis (pers. comm., April 13, 2019); D. Doria (pers. comm., April 4, 2019); C. Darland (pers. comm., March 20, 2019); E. Arenius (pers. comm., March 20, 2019); S. Berkow (pers. comm., February 26, 2019); R. Gibson (pers. comm., May 6, 2019); D. Robinson (pers. comm., April 16, 2018); D. Gibson (pers. comm., April 4, 2018).

the term, if not its actual meaning. Rarely did any of my interlocutors dare articulate precisely what Marsalis meant by the term—even those whose jobs had hinged on doing exactly that. More often, they’d defer to something like, “You’d better ask Wynton about that” (C. Darlan, pers. comm., March 20, 2019). It has never been a transparent matter to interpret Marsalis’s opinions about sound—often expressed through evocative metaphorical language—into the specialist vocabulary of the professional acoustician, and it has been equally difficult to translate such ideas about sound into the physical architecture of a room. Though my research confirms that all technicians took seriously the idea of an acoustic environment made “specifically for jazz,” it was not a simple matter to communicate with Marsalis and other non-technicians. Russell Johnson, the project’s top acoustician, initially responded to Marsalis’s descriptions with confusion, stating, “What the fuck is the golden tail?” (D. Robinson, pers. comm., April 16, 2018). Indeed, as Marsalis told me, “I wasn’t used to communicating in that language” (pers. comm., April 13, 2019).

Here is how Marsalis first described his ideal acoustics to me:

I call it the...golden sound, where the echo has a glow, but that it’s not so soggy in the bottom and the mids that you can’t hear the bass and the drums. Because in our form of music the highs and the lows are sounding on every beat. So, you want to be able to hear the bass and you also want clarity on the highs. And the biggest thing was to make sure the tail is not too long—but that there *is* a tail. If you don’t have a tail...it’s really dry.... The common misconception about the music is it should sound like it’s in a club [too dry for Marsalis]. Then you end up with a big concert hall, with volume that’s been sucked of all the life. So, we wanted the volume, but we wanted it to have life. (W. Marsalis, pers. comm., April 13, 2019)

In desiring a modest reverberation time (“not too long”), Marsalis aligns with widespread common sense about acoustics for jazz. The basic idea comes from the presumption that jazz is more dependent than other musical styles on “transients,” those sound events that are “intended to be perceived as distinct” (Schwenke and Ellison 2010, 1). And because excessive reverberation may cause successive transients to blur together, thus getting “muddy,” jazz should

sound better with less reverberation.⁸ So, if Marsalis is right that jazz has “highs and the lows sounding every beat,” excessive reverberation from the room’s surfaces could saturate the direct sound from the instruments themselves and thus decrease intelligibility.⁹

Put differently, if the reverberation time is longer than the time between salient musical events (eighth-note cymbal hits, for instance), the lingering reverberation following one event will still be resonating when the next one comes, thus blurring them together. For certain music, like chamber, orchestral, or choir music, this blurring of one musical event into the next might provide an aesthetically pleasing “blend” between notes, or between musicians in a section—or even between all the members of an orchestra. Or, it may provide a desired “fullness of tone” (Beranek 2004) that conveys an expansive feeling of spatial volume and symbolic grandiosity. It may also add a sense of spatial or spiritual transcendence—an airy quality to the space of musical performance that endows a feeling of autonomy from the everyday world (Blessner and Salter 2012; Rath 2012).¹⁰

⁸ *New York Times* critic Ben Ratliff (2004) described JALC’s earlier homes, the classical halls at Lincoln Center’s main campus, “respectable cultural landmarks that are nevertheless *physically hostile to the sound of jazz percussion.*”

⁹ Speech is an even more archetypal case: because of issues of semantic intelligibility, it is considered best with the least reverberation possible.

¹⁰ Though there have been extensive analyses of the appropriateness of various RTs for certain musical performance styles, mostly quantitative (see Beranek 2004; Jaffe 2010; Cressman 2016, 2015) but some qualitative (E. A. Thompson 2002; Eidsheim 2015), there has been no serious consideration of reverberation times suitable for jazz. This lack of attendance to jazz illustrates the music’s estrangement from the art worlds frequented by professional acousticians and endowed with tailor-made halls. See Schwenke and Ellison (2010) for a discussion of the dearth of information but no attempt to address it; see Wetmore and Ellison (2017) for an initial foray. The most well-known of the classical inquiries is Leo Beranek’s *Concert Halls and Opera Houses* (2004), which attempts to quantify, using surveys conducted with concert masters, *tonmeisters*, and other respected authorities associated with a range of the world’s most famous performance spaces, the ideal acoustical parameters for various types of Western classical music. The end result, he summarizes, is an ideal of 2 seconds for orchestral music and 1.2 seconds for chamber music (see also Eidsheim 2015; Cressman 2016, 2015; Jaffe 2010).

The idea that most prestigious music rooms are tailored to this reverberant aesthetic—deemed appropriate for Eurocentric art music—is reflected in Marsalis’s own words: “Most concert halls were designed for symphonic music, not jazz. Most of the time, we play in halls that have too much echo for our music. The tail of the echo is so long that it makes the music muddy. We have the drums playing all the time, which is not the case in symphonic music” (in Pareles 2004b).

A modest reduction in reverberation time, then, was the first and most overarching way that the acoustics of Rose Theater were tailored to Marsalis’s conception of jazz. Yet while Marsalis refers to this low-RT acoustic as “the biggest thing,” he simultaneously pushes against “misconceptions” that jazz should be “too dry” (pers. comm., April 13, 2019). Indeed, unlike the stereotypical acoustic aesthetic of a jazz club, which many consider to be a more “authentic” site of jazz performance—including members of the acoustics team (e.g., E. Arenius, pers. comm., March 20, 2019; C. Darland, pers. comm., March 20, 2019)—Marsalis wanted a little more “air.” For Marsalis, to mimic the low-reverberation time of such a space would be to sonically associate jazz too closely with a nightclub aesthetic that limits the music and its musicians. Nonetheless, across all the acousticians, theater designers, and other technicians I worked with, a lower reverberation time was the most consistently cited “jazz-specific” factor in the room’s design.¹¹

¹¹ See, e.g., McCarthy (pers. comm., December 13, 2018); D. Doria (pers. comm., April 8, 2019); E. Arenius (pers. comm., March 20, 2019); C. Darland (pers. comm., March 20, 2019); S. Berkow (pers. comm., February 26, 2019). Interestingly, I got the sense that, to Marsalis’s taste, the low-reverberation assumption may have gone too far; he told me at one point, for instance, that “all the rooms were too dry” (W. Marsalis, pers. comm., April 13, 2019).

1.3. “Closing the Gap”: Intimacy, Interaction, and Immediacy

Ideals of intimacy, and the centrality of human interplay and felt closeness, has been a crucial driver of jazz’s historical privileging of small clubs, jam sessions, and other close-quarters gatherings as paradigms of authentic jazz experience. As Bohlman and Plastino (2016) state, “Jazz is the art of the intimate” (1). Indeed, in all my years doing fieldwork at a range of jazz venues, I encountered no more prevalent trope for describing the ideal sonic environment for jazz than intimacy. “You listen to jazz in clubs that are very tiny sometimes,” JALC acoustician Ed Arenius told me. “Trying to capture the immediacy of that, I think, was more our goal than anything else” (pers. comm., March 20, 2019). As countless musicians and writers have attested, jazz demands interaction between musicians, listeners, and all sorts of human bodies sounding, listening, moving, and seeing (Monson 1996; Berliner 1994; T. Jackson 2012; Ogren 1989; Greenland 2016). These ideals of interaction and intimacy are often discussed in music-analytical terms, such as the musical interplay between musicians in terms of melody, harmony, timbre, rhythm, and so forth. Some authors extend such tropes to social domains like the interaction between musical personalities and their social networks (Monson 1996), or to broader, transhistorical conversations with “traditions” and cultural memory (Jackson 2012, 2016; Floyd 1995; cf. Gates 1988; Wilson 1992).

Though all these meanings are relevant to my inquiry, in the following pages I focus on how felt closeness and interaction operate within the domain of the material: how acoustics emerges from the physical construction of the room—its surfaces, its angles, its irrepressible propensity to *respond*.

To exemplify the importance of acoustical interaction and intimacy to the Rose Theater project, acoustician Damian Doria recalls the trope of *call and response*:

[Marsalis] definitely has a call and response thing that happens. And I'm sure it's not always the same people [in the audience], but they do respond to the music. Even in a formal environment, he wanted to have the sense of playing something and, you know, having somebody in the audience go, "hm." It's just *that* "hm" that is an important part of...the intangible part of jazz: that connection with the audience.... How you play with other musicians, on the stage, and how the audience responds to that is the unique thing that happens. (D. Doria, pers. comm., April 4, 2019)

Here, interaction takes a distinctly sonic manifestation dissonant with conventional notions of musical or discursive meaning: "that *hm*." Indeed, it is often the barely audible grunt of appreciation or the hushed murmur of pleasure that allows us to connect, communicate, and call and respond. Not to mention the more overt shouts, cries, and claps between audiences and performers common to jazz performance—and a constellation of Afro-diasporic forms exhibiting the trope of call and response (see, e.g., Floyd 1995; Epstein 1977; Wilson 1992). Or even the inaudible but nonetheless affecting sense of *presence* of all those human and non-human things vibrating as a "swarm of vitalities" (Bennett 2010, 32). Unlike a room dedicated to western art music, in which all non-musicians are "asked to be literally and metaphorically silent, so that the truth or beauty of the work could be heard in itself" (Goehr 1992, 237), Rose Theater is supposed to be a setting of active, audible interaction. This kind of interaction, which requires sensitivity to the subtlest of vibrational cues, is enabled more than anything by a sonic environment of *immediacy* and thus intimacy. How does a room foster this kind of environment?

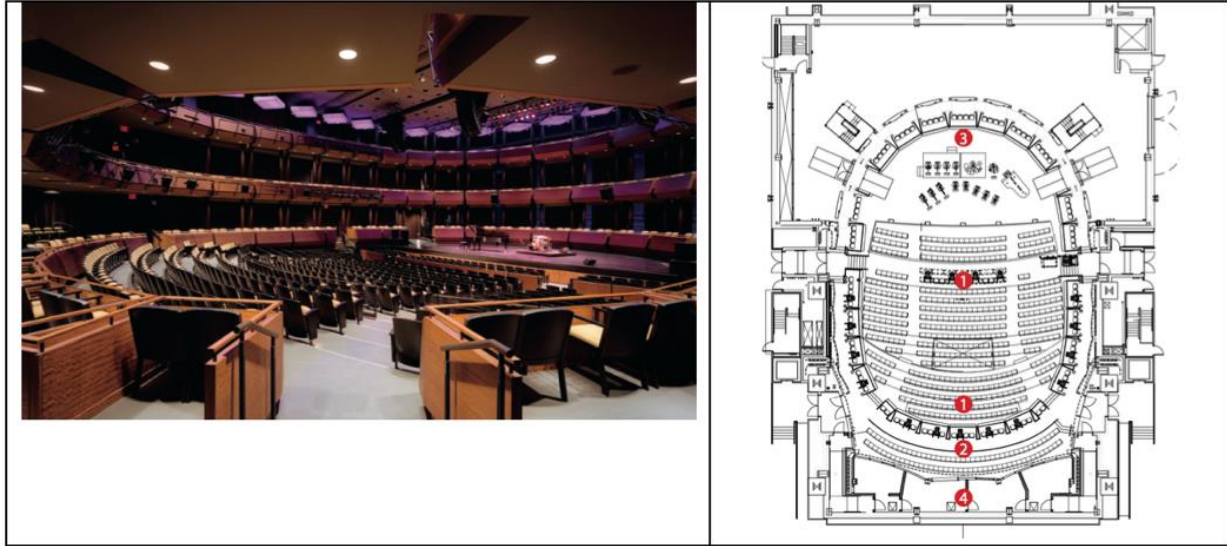


Figure 1.2: Rose Theater, seating and shape optimized for proximity

To start, musicians, listeners, and other bodies must be *close*. A short geometrical distance creates a multisensory experience of proximity, a heightened sense of embodied copresence through vibration. Despite Rose’s considerable size (for a jazz venue), the slopes of the floors, positions of the balconies, and variable seating configurations are all meant to optimize the closeness between human actors and sound sources (see Figure 1.2). Most important is the room’s “in-the-round” configuration, which, according to numerous interlocutors, was *the* most important, and most jazz-specific, adaptation the team made (E. Arenius, pers. comm., March 20, 2019; C. Darland, pers. comm., March 20, 2019). In this configuration, the stage is surrounded on all sides by seating, providing an immersive sonic and visual experience. A more compact arrangement of bodies results in more direct sight lines and shorter paths of direct sound, and thus a more immediate experience. Because the sound travels less average distance, what the listener hears is generally both louder (since it has had less of a chance to decay) and more temporally immediate (since it arrives more quickly).

Shorter physical distances also help the direct sound “outrun” the later reverberation by a few precious milliseconds, just enough time for the brain to (unconsciously) process the arriving

vibrations before they're washed over by the later overlapping reflections. The wider the time gap between the direct sound and the onset of reverberation, the easier it is for a listener to pick out intricate sonic information.¹² Distinct and frequently changing musical materials (percussion patterns, rapid melodies, etc.) are thus more distinctly perceived.

A similar principle applies to first reflections: promptness counts. Recall that early reflections are those vibrational paths that arrive at the ears shortly after the direct sound, having reflected off only one solid surface. The earlier they arrive, and the greater their strength, the clearer and better defined the intricacies of sonic materials will be. Sound sources will also feel subjectively closer and more temporally *immediate* (delivering more acoustical energy to the ears earlier)—making the room feel more intimate and generally higher energy. Here's the basic reasoning: in a smaller, more intimate space, with close walls, floor, and ceiling, the distance a packet of waves would travel to make the journey from source to surface to listener would be shorter, both in distance and time, than in a larger space (see Figure 1.2). Designing Rose Theater's acoustics to provide early energy as quickly as possible is one way of mimicking the feeling of being in a smaller room with closer walls. Moreover, the highly reflective environment helps sustain the ineffable sense of energy and connectedness between listeners and the bodies that surround them.

Another reason prompt early reflections were important to Rose Theater's designers was that they help counterbalance some of the negative consequences of the "golden" reverberation Marsalis desired. That is, strong early reflections, in conjunction with direct sound, help listeners

¹² Beranek (2004) calls this an increased "clarity" or "definition," which in his vocabulary—followed diligently by most acousticians and textbooks—are materially synonymous.

distinguish sonic details by getting plenty of sonic information to their ears before the arrival of the more blended and sometimes inarticulate late reverberation.

Together, physical proximity and manipulation of early reflections allow the acoustics of the room to maintain a feeling of immediacy and intimacy despite the room's warm and enveloping reverberation. The "golden sound of jazz" may thus be glossed as a balance between (1) the fullness of tone and feelings of spatial volume provided by reverberation and (2) the added clarity and intimacy provided by close proximity and strong and quick early reflections.

How are all these ideas about sound inscribed into the physical matter of the room? What did the acousticians, theater planners, and architects actually *do* to attain these goals? Put more simply, what is it about the room that makes it sound the way it does?

The most impactful physical manifestation of Rose's unique approach to acoustics is the array of hard, flat panels lining the "fronts" of all the balcony, mezzanine, and stage-level seating boxes around the theater (see Figure 1.3). (These panels are all generally referred to simply as "balcony fronts," even though many are not on balconies as such.) The bottom third of these inward-facing panels are carefully aligned to direct first reflections *down*, primarily for getting early energy quickly and strongly to human ears. They also beam sound to other hard surfaces for a general lively and high-energy environment. The panels' smoothness, hardness, and material composition (thick wood) mediate the strength, and relative warmth of early reflections. Their proximity mediates the reflections' quickness and strength (immediacy). The top third of the panels directs sound generally upward, which both keeps the stage and orchestra levels from being overwhelmed with sound and directs early energy to the higher seating levels.



Figure 1.3: Rose Hall “balcony fronts”

The panels near the stage are especially important, particularly those on the towers that surround the rear and sides of the performance area (see Figure 1.3). This arrangement of reflectors is intended, for one thing, to riff on the notion of an acoustical “shell” (also known as an “orchestra shell” or “bandshell”). Commonly used in acoustic music, especially western classical, an acoustic shell is a hard, solid structure that envelops the stage and is meant to strengthen the sonic immediacy between musicians and to funnel sound toward the audience. Without such a structure, onstage sounds might feel unnaturally weak, and musicians might feel distant and disconnected from each other. Musicians might also feel unnaturally disembodied, since the lack of close reflective surfaces forecloses on the sense of acoustic emplacement most human beings are accustomed to (if only unconsciously) whenever we dwell in enclosed built environments.

In Rose, the towers behind the stage, with their reflective balcony fronts, serve the same purpose as a shell. The balcony fronts reflect sound from the stage quickly and loudly to all the bodies on the stage—and only slightly less so to the bodies distributed throughout the rest of the room. Zooming out and thinking about the theater as a whole, it is fair to think of the room’s bath-tub-shaped configuration, with reflectors lining all the seating, as one giant shell enclosing the whole theater, audience and musicians alike.

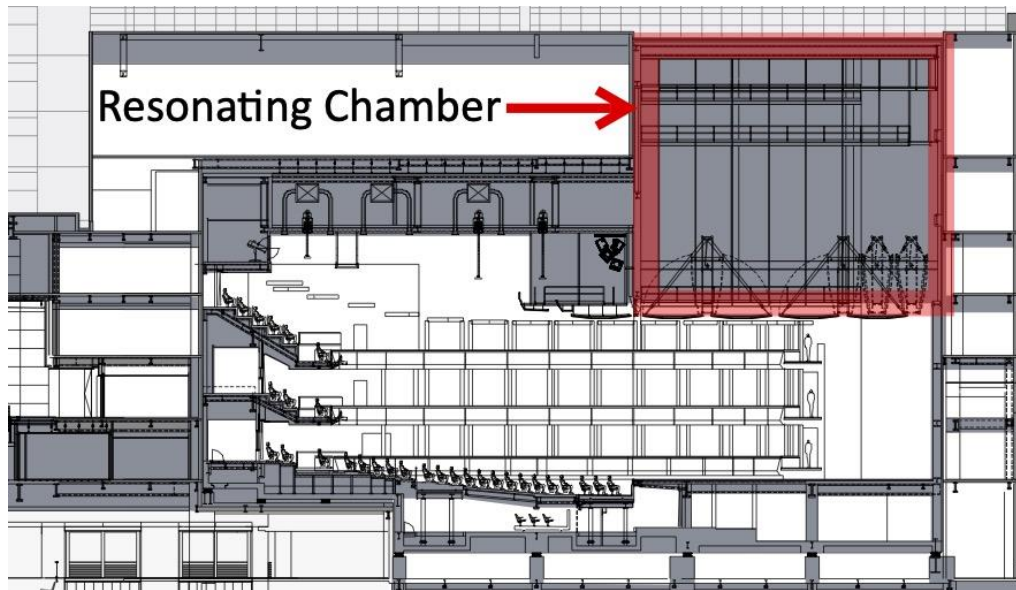


Figure 1.4: Rose Theater secondary resonating chamber. Adapted from illustration provided by Rafael Viñoly Architects.

So far, I have been discussing only the earlier material encounters in a sound’s journey around the room—direct sound and early reflections. The more temporally extended lingering of reverberation is provided principally by the room’s total geometrical volume (the bigger the room, the longer the reverb) and the net absorption of all the surfaces in the theater—chair coverings, walls, soft goods,¹³ human bodies, and so forth. Also, because it is “a pretty small volume room” (E. Arenius, pers. comm., March 20, 2019) compared to many classical halls, Rose contains a coupled resonating chamber far above the ceiling over the stage (see Figure 1.4). This chamber creates additional physical volume far away from the stage, adding to the room’s reverb “tail” without much interaction with the earlier reflections closer to the band and the audience. Importantly, because of the chamber’s relative isolation from the rest of the room, the reverberation it contributes is significantly delayed, which makes it less likely to interfere with transients and other musical details. This is another way the room’s designers attempted to

¹³ Soft goods include banners, curtains, and other fabric items that can be hung from the theater’s fly system and elsewhere. They are used for many reasons, including absorbing sound.

balance the richness of reverberation with the transient-heavy genre characteristics assumed to be typical of jazz.

If my discussion of acoustical concepts and their physical manifestation seems tedious, it is only due to my writing's failure to do them justice. On the other hand, if I have made these concepts seem *confusing*, then I may have succeeded. Indeed, though one of my primary intentions is to provide a "good account" (Latour 2005) of the diversity of material objects that work together to make live sound "happen," I also hope to give a sense of the sheer complexity, and even inscrutability, that is always present and should not be ignored when thinking about materially emplaced sound. For it is precisely the complexity of acoustical vibrations and their interactions with physical matter where we find sound's unpredictability, its resistance to human control, and ultimately a kind of agency—"the power to make a difference that requires a response" (Bennett 2010, 32).

For the rest of this chapter, I use the above acoustical concepts to analyze ethnographic observations of the activities around performances by two groups. The first is JALC's "house" big band, the Jazz at Lincoln Center Orchestra (JLCO), which uses almost no amplification. The second is the seven-piece group introduced at the beginning of this chapter, led by Marcus Miller and assembled specifically for a theme concert called "Marcus Miller: Electric Miles," a tribute to the late electric period of trumpeter and bandleader Miles Davis. Placing these performances in conversation reveals much about how the room responds differently to contrasting formations of sound, exposing how judgments about the "sound of jazz" materialize as complicated assemblages of vibrations.

1.4. “Who We Are”: The Jazz at Lincoln Center Orchestra in Rose Theater

No one would dare say that a single band could stand in for a definition of jazz. But one could say with some confidence that, at JALC, one band more than all others is representative of “who we are” as an organization (W. Marsalis, pers. comm., April 13, 2019): the Jazz at Lincoln Center Orchestra (JLCO). This ensemble is the life blood of JALC’s aesthetic universe. Marsalis plays with it more than any other, touring most of the year. When he says Rose Theater was “made for us,” the JLCO is the “us.” When he says, “we’ve played in halls all over the world,” the JLCO is the “we” (W. Marsalis, pers. comm., April 13, 2019). Though it certainly doesn’t encompass everything jazz music is, even to Marsalis, there is no better archetype of his and the organization’s ideas about jazz in its ideal form. It is with this band that Marsalis won his Pulitzer, for which he writes commission after commission, and with which he releases album after album. And it was with an ancestor to this group that Marsalis first embarked on his institutionalizing mission, in 1987, with the “Classical Jazz Series,” his first work with Lincoln Center, a few years before *Jazz at Lincoln Center* came into existence.

Led by Wynton Marsalis, the JLCO is JALC’s premier ensemble, frequently performing with special guests, premiering original commissions (the vast majority written by Marsalis and members of the band), or presenting special “theme nights.” These shows form a staple of each season’s calendar, including tributes to canonical artists (some type of “Ellington night” is programmed pretty much every season), accompaniments to film screenings (such as the “Ken Burns Country Music” documentary premiere), or JALC’s annual fundraising gala. The list could go on and on.

Though the JLCO plays in all three of JALC’s venues, Rose is their “home” (W. Marsalis, pers. comm., April 13, 2019). Essential to this sense of home is the *sound* of the room,

and crucial to this sound is how it supports the band without “muddying” the sound with reverberation, giving it the right amount of energy throughout the space without the need for amplification. As David Gibson told me:

I think that the idea that this room, you know, was built for the Jazz Orchestra [JLCO] is proven by the fact that the Orchestra plays here and it’s natural architecture without any help [no amplification needed]. And then you get an amplified music show and then *you need to start doing things* in order to get articulation for the show. (D. Gibson, pers. comm., April 4, 2019)

As an audio stagehand, Gibson’s job is about adaptation—getting different sonic productions to sound good based under constantly changing conditions. And the magnitude of adaptation—that is, the *work*—required for JLCO shows is markedly less than most others. The room makes it easy for JLCO shows because it does so much of the work.

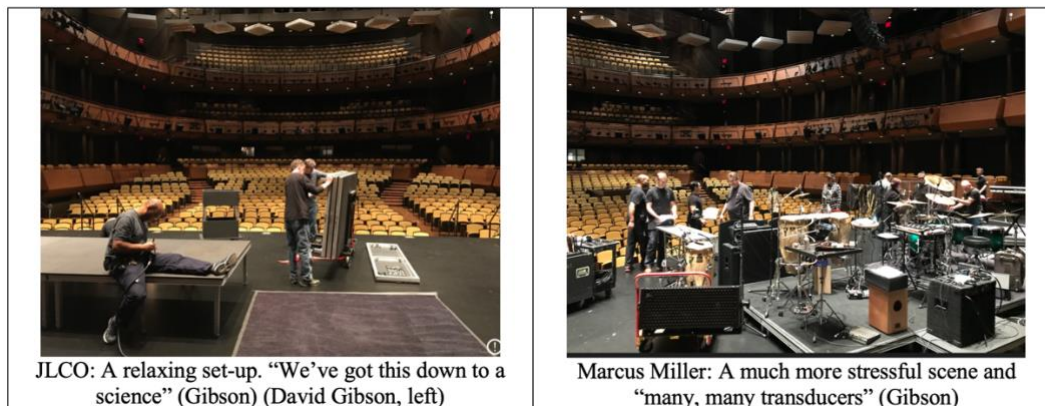


Figure 1.5: Comparing labor and technology, JLCO v. Marcus Miller

As I expand on later, the question of work—“the need to start doing things,” as David Gibson put it—is crucial to how the acoustics of a room condition human behavior and inscribe ideas about music and sound into the durability of “jazz steel.” Certain sounds, and thus certain genres and even certain people, become more welcome than others precisely because they encounter different levels of resistance. The JLCO, and acoustic groups with similar sonic characteristics, are made to feel “at home” in JALC’s rooms precisely because they encounter so little resistance. For the audio crew, JLCO concerts, which David Gibson calls “known shows,”

are conspicuously relaxed (see Figure 1.5). “We’ve got this down to a science,” Gibson told me. The musicians’ chairs always go in the same places. So do the platforms on which the chairs sit. Microphone placing is the same, as is the cabling and patching. Overall, because the room’s physical acoustics are so tailored to the JLCO’s sonic characteristics, there really isn’t all that much “audio” going on.



Figure 1.6: Front of house mix position (pictured: stagehand Alan Sheehy). Photo by Tom Wetmore.

Rose Theater’s unique relationship to the JLCO was made especially clear to me during a conversation with David Robinson during one of the countless JLCO sound checks and rehearsals I observed. Robinson is Marsalis’s personal “sound man” (Marsalis and Stewart 1994), and, with the rarest of exceptions, he is the only person to operate the mixing console or decide on microphone placement for Marsalis’s groups. On this day, Robinson and I were seated behind the main mixing console at the front of house position, which is situated in the center of the house orchestra section (see Figure 1.6). The JLCO was on stage sound checking for tonight’s concert, an 80th birthday tribute to McCoy Tyner and Charles McPherson, featuring the

music and performances by both men.¹⁴ As we talked, JLCO pianist Dan Nimmer was doing his best McCoy impression, a polite but nonetheless virtuosic performance combining deep and low pounding fifths in the piano's low end, quartal voicings in the middle, and fast eighth- and sixteenth-note runs in the highs and mids. The drummer, Joe Farnsworth, was splashing cymbals vigorously as the bassist, Gerald Cannon, pounded out a walking bass line, a pulse on each quarter note. No one else was in the hall save the stage crew, a few other JALC employees, the band and its entourage, and me.

Robinson was chatting with me about his disdain for noticeable amplification and loud volume overall. He told me about one day, years ago, when Marsalis asked him what he thought about hosting movie premieres in Rose or having "TV shows coming in with the rock stars and shit." Robinson didn't like the idea.

"I don't think our room *wants* to get loud," he told me, "and I don't think it sounds good loud. But it sounds good moderate." As I encountered frequently spending time in and around many performance venues, physical spaces and the technologies within them are often treated as subjects rather than objects. Robinson's observance of what "our hall *wants*" is typical, if especially poetic. To Robinson, the hall is more than an object to be manipulated; it is a subject of action and desire.

What the hall wants, it seems, is the sound of the JLCO, which Robinson calls "our band"—an ensemble so well-tailored to the room's sound it doesn't really need amplification. This key characteristic, the ability to appropriately host a certain formation of jazz performance without the use of electroacoustic reinforcement, indicates more than any other attribute the

¹⁴ Sadly, Tyner played only a brief sound check before opting not to perform in the public concert. It would have been Tyner's last public performance. He passed away in March 2020.

“sound of jazz” for which the room was built. Indeed, as Robinson explained, he’ll sometimes do away with amplification altogether, even during a public concert: “When we play *mezzo piano*, when we’re playing at moderate tempos and such, and the drummer’s playing brushes.... I really just turn the things off and go away.”

Robinson then turned his face to me: “If you notice, the PA’s off.” He gestured down at the “all mute” buttons, which, to my surprise, were activated. This meant the sound system was producing *no sound*. I hadn’t been listening closely to the music as we were talking, but everything had sounded perfectly adequate. Throughout our conversation, Robinson had been periodically jumping up to the stage to adjust microphones and talk to the musicians about how they sounded—so the PA must have been on at various points. I never noticed any drastic differences in sound level, tonal quality, or relative balance between instruments. I was also aware that the JALC had a philosophy—coming almost entirely from Marsalis and Robinson—valuing minimal amplification. But it was still a surprise that the PA was entirely unused as we sat there.

“So, there’s nothing?” I asked. Robinson punched the all mute buttons.

“Now it’s on,” he said. The difference was subtle. I could tell the bass and piano had more presence in the room; they didn’t seem excessively louder, but they certainly seemed more articulate and easier to distinguish from the rest of the ensemble. Like always with the JLCO, it didn’t seem like any of the sound was coming from the two giant speaker arrays framing the stage on the left and right. He tapped the buttons again.

“[It’s] back off,” he said. The piano and bass lost some articulation, sounding a little flabbier, a little more immersed or swallowed up in the mix. Individual notes were harder to make out. But the difference wasn’t pronounced. The pianist was “comping” at the time,

outlining the piece's harmony in a supportive role. I would have desired more amplification if he'd been soloing, but as part of the overall ensemble I didn't find any glaring absence where the piano should have been. The bass lost even more articulation than the piano, but as a basic harmonic presence it was still recognizable.

Robinson then turned the PA back on and reached for a few faders on the left of the console—the customary place for rhythm section instruments. He grabbed two and started moving them up and down in tandem.

“That's the piano.” As the faders went up, I heard the piano a little more, especially the feeling of individual keys and individual notes. The piano sound was now more defined, but it didn't really sound louder. He pushed the piano faders back down, then the adjacent two faders up, thus sending the bass to the PA.

“That's the upper articulation of the bass. It's the harmony and the motion of the bass.” The bass, like the piano, changed in character rather than volume.

“But it's not that much,” I said.

“No! It's very little. A moderate amount.”

For the JLCO, the bass and piano are the only instruments amplified in any significant way. Robinson will tweak some of the other mics a little here and there, and they are indeed “hot” (active), at least technically, but you'd be hard pressed to tell the difference if any mics were muted other than piano and bass. Or soloists or vocalists.

And since the room is designed to be “warm”—slightly boosting certain low and low-mid frequencies—the amplification of the bass isn't really about adding energy, or “loudness.” This became clear when Robinson muted the PA again, and I listened closely to the bass sound. It was a little more difficult to hear the individual attacks of the bass, which derive mostly from the

higher frequency transients from the fingers on the strings, rather than the deep resonance of the instrument's body. Yet the main sound of the bass, and, most important, its function within the harmonic context of the musical performance, was still present.

Robinson turned the system back off, and we listened on as the trio on stage peaked in energy. He grinned with pride: "Almost no hall in the world, really, can you hear the walking bass like that with that drummer playing that loud."

My discussion with Robinson points to a key sonic tension between lightly amplified "acoustic" shows, like the JLCO, which require little human or technological labor, and amplified "electric" shows, which require both human beings and technological systems to "start doing things," in the words of David Gibson (pers. comm., April 4, 2019).

1.4.1. "We've Got This Down to a science"

For the audio crew, JLCO concerts are relaxed, both during the setup and the shows themselves (see Figure 1.5). David Gibson calls these "known shows," asserting that "we've got this down to a science" (pers. comm., April 4, 2019). The musicians' chairs are always put in the same places, as are the platforms on which the chairs sit. Everyone knows where in the building's countless storage closets and work boxes to find the proper-length cables. The same is true for finding the proper microphones, which are stored in closets and racks all over the building. (For most shows, finding the right microphones and cables is rarely as simple a task as one would expect.) For these shows, rarely does any of the crew have to ask any questions, and rarely is there much anxiety.

The relaxed preparations for these shows are made possible in large part by the extremely sparing use of amplification. The JALC doesn't even use stage monitors, the loudspeaker "wedges" meant to help distant band members hear each other. "Wynton prohibits monitors,"

David Gibson told me. To use them, according to the Marsalis philosophy—which filters throughout the whole building—would disturb the natural balance and blend of the band. It “colors your perspective” (D. Gibson, pers. comm., April 4, 2019). Each musician, in this view, might listen more to the sound coming out of a monitor than their neighbor’s actual instrument, which may lead to “unnatural” blending (inappropriate changes in tone, volume, articulation, etc.). In situations with more reinforcement from the sound system—where the audience gets most of the sound from speakers and not from instruments—such imbalances could be remedied by a competent mix engineer familiar with the desired aesthetic (as is generally the case in the Appel Room, discussed in chapter 2). The engineer might, for instance, bring down the level of one instrument and up another, or tweak the EQ or add dynamics processing—all trying to restore the aesthetically appropriate ensemble sound. Marsalis would have none of this if he could help it. Jazz, to him, is about the musicians, sometimes about the audience, but certainly not about loudspeakers.¹⁵ In the end, then, for JLCO shows it is the room that does most of the work that in other contexts would be delegated to audio technology and its operators.

In the next section, I contrast these comparatively simple “known shows” of the JLCO with the amplified Marcus Miller concert alluded to at the beginning of this chapter. Not only will we see that the room places differential burdens on some shows versus others—we also find that the room itself *pushes back*.

1.5. “Too Loud for Lincoln Center”: Marcus Miller’s “Electric Miles”

“It’s just too loud, baby,” Miller said, shaking his head. “Jordan, we’ll have to turn it down. Too loud for Lincoln Center.”

¹⁵ The best quality sound systems are still a paramount concern, which I discuss in chapter 2.

The same reverberation that furnishes JLCO with its “golden sound” has a very different effect on louder, more-amplified sounds. For acoustic groups, especially those with unamplified brass, reeds, and especially acoustic bass, there is a distinct advantage to the “in-the-round” seating configuration, which minimizes distances between bodies, as well as the purposefully “loud and fast” bloom of early reflections that provide immediacy and clarity (E. Arenius, pers. comm., March 20, 2019). For such ensembles this acoustic environment facilitates clear hearing and feelingful interaction between musicians and others, and it creates a sense of immersion and intimacy between musicians and the audience. And it strengthens the overall energy of the sound through a kind of purely mechanical amplification. But all of this can get out of hand awfully quickly when there’s too much sound coming from the stage.

A perfect example was the Marcus Miller “Electric Miles” show—which I turn to now. For this show, the stage was strewn with electroacoustic transducers. Loudspeakers were everywhere, encased in monitor wedges, stand-alone amplifiers, and unpowered speaker cabinets. The stage was home to electric basses and guitars, electronic keyboards and drum machines, saxophones and trumpets playing through pedalboards, and all manner of other electronic gadgetry (see Figure 1.5). The mass of sound from these and other electronic sound machines was poised to overwhelm the carefully cultivated acoustic balance embedded of the room’s material architecture. Or, better stated, the *room* was poised to overwhelm the space with its response.

“This is going to be wild and woolly,” John Uhl told me first thing in the morning, before anyone else from the crew had arrived for the 9 a.m. load-in. Uhl is JALC’s second Head Sound Engineer. While he works almost exclusively in JALC’s mid-size venue, the Appel Room, on this day Uhl was tasked with assisting at Rose because of the technical complexity of the Miller

concert. “Rose is such a reverberant acoustic space,” Uhl told me a few days before the show, “that to put that much electronic energy into the room—that’s going to be a huge challenge” (pers. comm., March 20, 2019).

He was right. The whole day was a struggle—against loudness; against amplified vibrational energy; against “sound foci” (isolated spots where certain frequencies are way too loud) and their associated “dead spots” (see Lewcock et al. 2001); against the screech of audio feedback. Most pressingly, it was a struggle against the inevitable accumulation of low frequency energy—what David Gibson calls “trash sound” (pers. comm., April 4, 2019). For, in this room, with all its vibrant reflectiveness, whatever sound bursts forth from the stage (or anywhere else) will inevitably be reflected *back* by the room—in largely unpredictable ways. Indeed, the same “in-the-round” configuration that supports acoustic groups like the JLCO by raising the acoustic energy through the liveness of its early and late reflections, would only augment the incredible onstage energy from the band.

Unlike JLCO concerts, the morning and afternoon of this concert were a flurry of stress and uncertainty. Early on, the crew convinced Miller himself to reduce the number of monitors he’d use, and to move them from his preferred position at the downstage center of the stage. (This was important because sound from that precise spot always prompts the room to manifest a low-frequency focus down the center of the hall.) But the biggest issues concerned the raw magnitude of sound energy the crew feared would be coming out of the profusion of speakers on the stage that kept accumulating as the load-in progressed.

There would be no perfect solution, but the first and best hope was to convince the musicians to further reduce the number of monitor speakers on the stage while gently suggesting they dial back the volume. The crew also had to take care about the *orientation* of all the onstage

sound sources. This meant carefully balancing how much sound to direct toward the audience (which can cause problems by throwing off the PA mix—and it can *hurt* the ears) and how much to direct away from the audience (which can also cause issues, since it would direct sound at the room’s most reflective surfaces). And they had to place, with considerable care, a batch of microphones that could catch any errant or extraneous sound, amplify it, and send it back into the monitors and sound system. Without the most vigilant transducer placement and sensitive mixing (muting certain mics when not in use, carefully shaping EQ to avoid feedback, etc.), all could go haywire. And when the moment finally arrived for all the musicians to plug in, it was still a mystery how the room would respond.

“Alright, let’s make some sound.” It was about 4:45 p.m. and Marcus Miller, bass in hand, was summoning his band to start sound check. Jeff Turner, the theater’s master carpenter¹⁶ and resident wisecracker, caught my eye. “I hope you got your ear plugs,” he told me. Everyone knew it was going to be loud. Gibson and Uhl had been warning me for weeks. Fortunately, one of the audio stagehands, Allan Sheehy, overheard Turner’s joke and found some ear plugs for me. I needed them.

After just a few notes of the band’s first vamp, a simple repeated figure harmonized in fourths and fifths—complete with synthesizer, bass, guitar, and horns, most of them playing with distorted electronic effects in the mid and low frequencies—it was clear this performance would be unlike anything else in my fieldwork at this venue. When it all started, I was in the backstage wing, stage left, and I walked around the stage-level boxes hugging the stage. The sound coming

¹⁶ Master carpenter is the designation of the head of the carpentry department. There are three stage technician departments: carpentry, electrics/lighting, and audio/sound/video. The “head” of the second department is known as “master electrician,” while the audio department head is just the “head sound engineer.”

from the stage (that is, from the band's own amplifiers and monitors) was so loud that I didn't even know if the room's sound system was on. It wouldn't have mattered anyway, since the onstage sound was so overpowering.

At one point, Gibson pulled me aside. "What we're seeing here is the idea that this stage is for acoustic music," he said. "You put many transducers on the stage—many, *many*—and it's very difficult to manage." On the stage were three stage monitors for the electric bass, along with the eight(!) ten-inch speakers mounted in Miller's two amplifier cabinets. Each horn player—two trumpets and a saxophone—had their own wedge, sending both untreated "acoustic" sound and much more "electronic" sound filtered through a range of effects pedals. The keyboardist and drummer had two monitors each, the percussionist and guitarist one. The guitarist also had two powerful tube amplifiers, so loud they had to be covered with sound insulation so elaborate that one of them blew out from overheating. (Luckily, they'd rented a backup.) All told, 32 speakers crowded the stage, not to mention a horde of microphones ready to contribute to feedback, phase effects, and all sorts of other potentially unwanted phenomena. While this magnitude of electroacoustic technology is common in the live music industry, it is extraordinary at JALC.

How did the room "respond"? All the sound coming off the onstage loudspeakers was being sent right back by the flat reflective panels of the tower seat fronts surrounding the stage—only louder, lower, and more distorted. As expected, the low frequencies were the most problematic: the electronic keyboard's distorted left-hand work; the fat, fuzzy effects on the horns; the drummer's sub-bass effect on the bass drum; the percussionist's electronic subharmonic bass pedal. The room was having none of it, sending all these sounds back lower, louder, and muddier.

The electric bass was especially troublesome. In JALC’s ideal scenario, such as an acoustic group like the JLCO, the unamplified bass needs acoustic support (added loudness) to balance with the rest of the instruments. This support is provided by a highly reflective environment with a subtle low-frequency tilt (discussed above). But the calculus is entirely different for an amplified group—especially one with an electric bassist as featured soloist. The amplified sound of an electric bass is only made “tubby” and “boomy” as the room’s highly reflective environment sends back wave after wave of overlapping bass energy. The characteristic attacks of each note become indistinct among the piles of muddy low-end “garbage” (D. Gibson, pers. comm., April 4, 2019) that accumulate throughout the room.

As I walked around the theater during the sound check, I could hear and feel the overpowering energy coming off the monitors and onstage amplifiers, and, only somewhat less powerfully, how the smooth-pained reflectors on the surrounding towers were collecting waves and sending them back at the stage and all over the theater. The reflected waves had a subtly different personality—buzzier, a little thicker in the lows, and, most conspicuously, just plain muddy. Ideally, I’d be able hear each instrument clearly and distinctly, but it felt like a cloud hovered over each instrument. Subtle details were submerged under an ocean of tones and distorted overtones, and the palpably shaking material architecture around me. Moreover, sound was accumulating unevenly over space. As I walked around the theater, I found noticeable vibrational hotspots, where it was not only especially loud, but where I could feel a subtle hum vibrating the towers, boxes, stairs, and other bits of solid matter that surrounded me. Certain frequencies caused various parts of the theater to buzz and sometimes shake (surely the effect of various resonant frequencies of objects throughout the room). But all these issues were subtle

compared to the raw energy in the space—the brute loudness and the accumulation of low-end sound.

To reduce the raw acoustical energy of the amplified music, Gibson and his crew had done everything they could to increase the overall absorption of the theater. The room’s design gave them a range of options—for, although acoustic jazz was the top priority when it was built, Rose was also intended to be a multi-use facility. It was thus constructed with a number of possibilities for altering its acoustics, including a movable ceiling that can change the room’s overall volume, a system of sound dampening curtains in the walls, and an array of additional “soft goods” to soak up excessive vibrations. As Gibson put it, the crew had “supermaxed out” the room’s absorption for the Miller group’s concert—deploying every available means (pers. comm., March 29, 2019). In addition, in the preceding weeks Gibson had pushed hard with the band’s management to reduce the number of transducers on the stage. But no one was surprised that the Miller band’s sound would overwhelm any attempt to corral it into the venue’s typical acoustic ideal.

It was not entirely in the band’s interest to reduce their volume. They wanted to *hear* themselves. They wanted to hear each other. And they wanted to hear it *loud*. And even if the band’s amplification conflicted with JALC’s overall desire for “pure and clean sound” (D. Hosney, pers. comm., December 19, 2016), loudness was a meaningful component of the band’s purposefully executed musical aesthetic—not to mention a way of getting in the groove and channeling musical energy between band members. A central tension thus emerged between giving the musicians the sound they needed “to do their thing” (D. Gibson, pers. comm., March 29, 2019) and the need to minimize negative acoustic effects of so much onstage energy. For the audio crew, the goal was to mitigate against potential disasters they could never quite predict—

because sound has the capacity to surprise. The best the crew and the band could do was place the monitors at the most conducive angles—an iterative and complex process that sometimes seems as improvisational as the music—and hope that the band could feel the emotional energy they needed without too much onstage loudness. But it wasn't easy.¹⁷

1.5.1. “They’re Having a Freak-out Over How Loud It Is”

The tension peaked as day turned into night. It was shortly after 7 p.m., a time when the musicians typically would have long since retired to their dressing rooms and stagehands would be casually socializing or attending to routine tasks. These are usually serene moments, when well-dressed house managers and ushers quietly sweep the seats and stack paper programs, readying the reposeful theater for the audience assembling on the other side of the doors. But not today.

“They’re having a freak-out about how loud it is,” one stagehand told me. “They” were members of JALC’s Concerts Department, the organization’s main aesthetic curators. It is the Concerts Department, overseen by Marsalis, that books the season’s calendar and tends to the overall direction of JALC’s programming. A representative of this contingent had entered the house and was huddled around the main console, along with Gibson, Miller’s engineer (Jordan Long), and a stagehand on Gibson’s crew. The band was on stage, and Miller was running back and forth between the stage and the console. As Gibson told me later, the rep was concerned that the “typical patrons” might be perturbed by the loudness in the room (pers. comm., April 4, 2019). These patrons, which JALC takes considerable pains to cultivate, carry a lot of weight

¹⁷ The crew also did everything they could to “deaden” the room, a topic which allows me to discuss another aspect of the theater: variable acoustics. David Gibson said it was “super maxed out” with absorption (pers.comm., March 29, 2019).

around the building. They subscribe to multi-concert packages or whole seasons, and they often donate large sums to JALC. They are also more likely to show up to a concert like Miller's expecting a performance closer to JALC's aesthetic center—acoustic, lightly amplified jazz.

At one point, after conferring with the group at the front of house position, Miller returned to the stage. "It's just too loud, baby," Miller said, shaking his head. "Too loud for Lincoln Center." The band discussed how to reduce the energy while maintaining faithful to their creative identity. As Miller put it, "We still gotta figure out how to do it with intensity." As showtime inched closer, the band continued to struggle to find the kind of interactional group feeling they are used to, one mediated largely by volume, not so much the subtle acoustic nuances the room was built for. The stage technicians were sensitive to their desires. Gibson told me he'd have no problem with distortion, mushiness, and general "garbage sound" if it allowed the musician's to "do their thing" (pers. comm., March 29, 2019). Doug Hosney, JALC's Vice President in charge of the whole complex, also stopped by around this time, telling me basically the same thing: he always prefers to defer to musicians, for their comfort is paramount. But this didn't seem to be his battle to fight, and he didn't get involved.

The band continued rehearsing, stopping every few minutes to discuss. After a little bit, I heard a voice from the front of house area: "Play out like you will during the show for maybe like five minutes." It was the rep from the concerts department, wanting to feel just how loud it might get. The band obliged. From my position slightly off stage it didn't seem much quieter. Especially when the horns and guitar got into a call and response section, trading solos every eight bars, each eight getting louder and louder. They seemed to get lost in the energy of the performance. From a distance, the face of the concerts department rep didn't seem any happier

than before. But it was time to open the house and everyone had to clear the stage. Little seemed settled.

1.5.2. “Because of the Fears”

The public concert was marked by tentativeness from the start. I’d expected something deafening, based on the sound check and all the apprehension that surrounded it. But from my seat in the rear of the mezzanine, it started off surprisingly quiet. All the instruments seemed hushed, almost nervously so—except, unsurprisingly, Miller’s bass, which boomed unevenly throughout the hall. The bulk of the sound seemed to be coming from the monitors and amps on stage, which could at least partially explain the imbalance among the musicians’ sound levels. Miller’s setup, after all, had by far the most total speakers, and he wasn’t shy about using them. The onstage imbalance in output was compounded by the room’s physical reflectiveness and subtle “warming” coloration—to say nothing of the sub-ideal reverberation time, which has the chronic tendency to extend and “collect” bass energy more than other frequencies. Indeed, despite the less-than-expected level of overall sound, the space was still permeated by bass, loud yet conspicuously lacking in clarity, definition, and evenness over the frequency spectrum.

But overriding all of these technical concerns was an unmistakable hesitancy on the part of the musicians, which manifested as an overall reduction in energy. “If it’s a light volume,” David Gibson later told me, “they don’t have that same kind of psychological energy.” It is no stretch to speculate on the primary cause: Miller’s earlier prodding for the group to bring down their monitors. To me, having witnessed the tense scene between the concerts department and the band less than an hour earlier, it seemed only natural that the band—and the band’s sound engineers—would have some apprehensions about turning up the volume. When I asked Gibson about this, he concurred: “I think your observation is right on, you know. *Because of the*

fears...it sounded light.” Indeed, the fear of overpowering the room, the fear of upsetting the institution and its patrons, seemed to be restricting the band from finding the usual “intensity” Miller referred to in the sound check.

But as the show went on, the musicians eventually found that intensity. How? In short, it got *loud*, probably just as loud as anyone had feared. It got distorted, and it got muddy. Various parts of the theater buzzed, hummed, and shook—others didn’t. Judged on the criteria of purity of tone and spatial uniformity, the sound had little to recommend it. But as the energy increased, the band found a way to relax, to interact, and to enjoy—in Gibson’s words, to “do their thing” (pers. comm., March 29, 2019). All of the instruments, now incredibly loud, seemed balanced relative to each other. (The low-end boominess never went away.) It felt almost as if a master compressor¹⁸ had been applied to the whole room: the quieter instruments got significantly louder while the already-loud bass seemed to reach a peak, simply not able to get much louder.

The band was no doubt fueled by the changing disposition of the crowd, which became increasingly vocal and animated as the concert progressed. As David Gibson told me, “The typical audience, let’s say for as Jazz at Lincoln Center Orchestra show—they would not have put up with that [loudness]. But it wasn’t our typical audience. It was Marcus Miller and Miles Davis.... That’s what they came to see.” The crowd’s spirited reaction likely put the musicians’ minds at ease over the concerns expressed by the Concerts Department earlier in the day. As the crowd got into it, the band did too, and the whole system got louder. Gibson added: “The

¹⁸ Put simply, a master compressor lowers—or “compresses”—the sound amplitude during moments when it rises above a desired threshold. When effectively applied, compressors can “smooth” out any number of variations between musical/sonic materials—sometimes described as increasing the “blend.”

audience was going crazy.... [There was] so much head boppin' and in-seat dancing going on in that show.”

1.5.3. “Some Rooms Make You Shout, Other Rooms You Whisper”

Despite the manifold challenges that the room’s acoustics imposed on the musicians, technicians, and other staff, the concert was a success. But it took a series of negotiations to make it work. These weren’t only negotiations between musicians, or between musicians and the venue staff—though these were essential. It was also a series of negotiations across a wide network of human and nonhuman bodies, objects, and artifacts. The room, its reflectors, its absorbers, its angles, and its electroacoustic architecture all had to function in complicated, often unpredictable ways, along with human actors and their instruments and other technologies.

The performance was not a simple matter of human musicians making sound in a room and audience members listening to it. The room, and its component materialities, formed a “throbbing confederation” (Bennett 2010, 23), a collection of material actants through which the phenomenon of sound *emerged*. The ideas of uncertainty, surprise, and adaptation are key here. Miller, as I observed, was taken by the unexpected acoustic interactions his bass made with the room, and how the rest of the band and its loudspeakers rattled and boomed throughout the space. These musicians, like any human being entering a new space, had to adapt to the environment. As did the technicians and the technologies they manipulated: transducers were moved and re-moved; frequencies were filtered; equipment was swapped out.

Sound moved and flowed in unpredictable directions, much like Jane Bennett’s description of the distributive agency of electricity: “Electricity, or the stream of vital materialities called electrons, is always on the move, always going somewhere, though where this will be is not entirely predictable. Electricity sometimes goes where we send it, and

sometimes it chooses its path on the spot, in response to the other bodies it encounters and the surprising opportunities for actions and interactions that they afford” (2010, 28). The same is at least as true with sound, and especially so when lots of transducers are involved. Acoustic feedback, phase effects, and sound foci manifested spontaneously as swarming vibrations through gases and solids, inducing material associations between speaker cones, microphone diaphragms, human bodies, and all manner of physical matter. In short, by not “responding well” to the band’s electronic sounds, the room conjured myriad unpredictable sounds that required its human occupants to scramble to form new ways of relating, new ways of sounding, and new ways of associating with matter and technology.

From this perspective, it is difficult to imagine the room as passive or inert. Even to Wynton Marsalis, rooms exert a kind of agency. He told me: “You’re going to talk differently in a different type of room. Some rooms make you shout, other rooms you whisper. I mean, the ambience of the room affects how you *are* in the room.... How you *are* in the room is affected by what the room *is* and the feeling of the room.” These words should not be dismissed as figurative fancy. For it is not immediately apparent to most people that a room can “make you” do anything at all, let alone shout or whisper. But Marsalis means it. And one would be hard pressed to find a more apposite metaphor for the Miller group’s oscillation between quiet and soft, or the audience’s changing level of interaction over the course of the concert.

By responding to human and technological sounding, the room created undesirable acoustic effects that were patently conspicuous, enough to unsettle anyone’s casual misapprehension that space exists only to transparently transmit from one place to another—that it is a transparent and “vanishing mediator” (Sterne 2003; see also Slaten 2018; E. A. Thompson 1995; Perlman 2004; Born 2005; cf. Jameson 1973). The room’s mediation, as my observations

have shown, is anything but vanishing—and anything but silent. It is thus best to think of Rose Theater in terms of Bruno Latour’s notion of mediators as networks of objects that “transform, translate, distort, and modify the meaning or the elements they are supposed to carry” (2005, 39; cf. Born 2005).

As one such mediator, Rose Theater has a profound capacity to influence not only the behavior of human and non-human actors, but to participate in and alter the meaning of the music that is performed there. I do not mean to argue that the acoustics of the room can encore all aspects of a coherent, self-contained definition of jazz as a musical genre or style. Instead, my aim is to provide what Latour (2005) calls a “good account” of those moments and situations in which associations between objects—which spend most of their time unnoticed—make their influence known. To construct such accounts of these networks, according to Latour, is to “*make them talk*, that is, to offer descriptions of themselves, to produce *scripts* of what they are making others—humans or non-humans—do” (2005, 79).

So, if I have made Rose Theater talk, then what did it say? For one, my observations reveal a subtle hole in Marsalis’s claim that the building is “a house of hospitality and style”—for the room was on multiple occasions and in multiple ways palpably inhospitable to Miller’s amplified aesthetic (pers. comm., April 13, 2019). The room pushed back, reflecting sound beyond the limits of conventional propriety and pleasure. The room’s size, reflectiveness, and reverberance were all unfitting to the band’s sound. This sound also encountered the extra-sonic cultural boundaries represented by the dramatic pushback from the Concerts Department.

The room’s sonic resistance to Miller’s performance should not come as a surprise. Marsalis has taken particular exception to both “electric” instruments in general, jazz “fusion” more specifically, and Miles Davis’s electric explorations even more specifically. Indeed, for

Marsalis, electric instrumentation and amplification are paramount signifiers of musical styles specifically deemed *not* to be jazz. Marsalis often aligns such technological accoutrements with a kind of “selling out” that certain musicians (and music industry actors) too often, in his mind, perform while baselessly claiming the title of “jazz” (see, e.g., Marsalis 1988). “The electric instruments make the musicians sound like they’re playing toys when they play,” Marsalis has said, calling electric jazz fusion “the death toll for jazz musicians” (Milkowski 2000). To Marsalis, playing electric instruments is a true difference-maker in contests over musical authority and, perhaps most important, authenticity: “suddenly a non-musician could be elevated above a *real* musician” (emphasis added).

Marsalis has focused particular ire on Miles Davis’s electric bands, once referring to the trumpeter’s playing during his electric era “some sad shit” (Jacobson 2001). The worst of these bands, according to Marsalis and many other traditionalists, were those that followed the trumpeter’s five-year retirement in the late seventies. Unlike the more respected pre-retirement 1960s and 1970s groups (which gave us albums like “Bitches Brew” and “In a Silent Way”), the later bands were more considered more “pop” oriented. As Ingrid Monson (2003) states: “To many critics of Davis’s post-fusion music, his use of rock and funk grooves, synthesisers and electric guitars are sins that cannot be forgiven” (131). It is to this era that Marcus Miller belongs, and to which the concert was dedicated.

It is thus unsurprising that the room JALC claims is “built for jazz” exhibited a distinct resistance to the amplified jazz fusion Miller performed. The room’s acoustic pushback thus elegantly inscribed in material form the institution’s aesthetic and ideological disfavor for the musical aesthetic Miller represented. According to STS scholar Tom Gieryn (2002), physical buildings “stabilize social action by increasing the costs of subsequent tinkering or innovative

use.” Certain actions encounter material recalcitrance, some actions are made easier. In the case of Miller’s concert, the reaction of the room, and the amount of *work* required to overcome it, speaks considerably to the durability of the aesthetic values built into the room by its designers. As Gieryn states, “The interests of powerful voices in the design process are etched into the artifact itself” (42). What were those interests? And how did they affect the “costs of subsequent tinkering”?

Recall David Gibson’s assertion that Rose was “built for” the JLCO, and that this is “proven by the fact that...it’s natural architecture without any help,” in contrast to an amplified show, in which “you need to start doing things” to make it work (D. Gibson, pers. comm., April 4, 2019). It is perhaps on this point that the room’s mediating agency is most concrete: *it places demands*—labor, technological, economic—on certain styles of sonic performance and not on others. The room *challenged* Marcus Miller’s band, as well as the technicians and even the ideological arm of the institution (the Concerts Department). Such hindrances were notably missing—or at least very different—in my many days I spent observing the JLCO. The music Miller played, and its sonic production aesthetic, was thus placed in an unstable and uneasy relationship to the core definition of jazz that JALC attempts to stabilize and promote. Miller’s musical style is not quite *excluded*, but the additional burdens make for an uneasy presence within the physical and ideological space of JALC as an institution. The room itself, and the way it responds, hinders the potential for Miller’s music to feel “at home” in what Marsalis calls “the House of Swing.” I am not implying an insurmountable division between “jazz” and “not jazz.” After all, a range of musical groups have performed at JALC that are in many ways dissonant with the jazz tradition implied by JALC’s distinctive musical ideology. Not to mention the countless productions at JALC that attempt no claim to being jazz—or, for that matter, music.

(Among JALC’s many rental gigs are classical and popular music shows, as well as a steady stream of “corporate” gigs—stockholder meetings, industry expositions, etc.). There are many reasons for JALC to bring in groups that might fit uneasily with the core jazz tradition, not least the need to bring in income or to expand the patron base (D. Hosney, pers. comm., December 19, 2019). Rose Theater, like the rest of the JALC facility, was designed with a core level of adaptability with precisely these needs in mind (B. McCarthy, pers. comm., December 13, 2018). But, as my research confirms, there is nonetheless an unmistakable set of aesthetic priorities at the center of JALC’s sonic ideals.

So, what can we gather about the sounds that *are* meant to feel at home in this room? Perhaps the most resounding theme has been an emphasis on *acoustic*, unamplified sound, a “pure and clean” environment evocative of western classical aesthetics (D. Hosney, pers. comm., December 19, 2016). A special emphasis is placed on the acoustic bass, which requires careful treatment: just enough tonal warmth to provide support and a pleasing tone without so much low end as to lose articulation and clarity. Moreover, the size of the room, its reflectiveness, and its overall reverberance were tailored to the physical dimensions, stylistic characteristics, and overall sound level of one specific band, the Jazz at Lincoln Center Orchestra.

By focusing on intimacy, immediacy, and interaction, acoustical qualities like swift and strong early reflections register ideas about jazz’s core performance practices that are longstanding and not seriously disputed (see Monson 1996; Berliner 1994; T. Jackson 2012; Ogren 1989; Greenland 2016; Wilson 1992). The emphasis on interaction, and the need for musicians and audiences alike to hear overlapping, rhythmically and melodically dissonant musical statements, resonate considerably with Marsalis’s master trope of “swing”—which he often describes as a dancelike negotiation between the individual creative voice and the pulsating

improvisational collective. That is, to “coordinate with something that is always shifting and changing” (Marsalis in Scherman 1995). A more rigorous interpretation might be found in Olly Wilson’s proposal of a “heterogenous sound ideal,” an approach to music making Wilson locates in many Afro-diasporic musical forms. Such a system values encompasses “a kaleidoscopic range of dramatically contrasting qualities of sound (timbre) in both vocal and instrumental music” (1992, 329), as well as the overlapping of contrasting attacks, articulations, and various other performative nuances. Travis Jackson (2003) claims such a sound ideal to be pivotal to jazz performance practices, asserting it to be “diametrically opposed” to “the kind of ‘blend’ that orchestra players seek” (89). We may easily see this opposition between heterogeneous versus “blended” sound ideals in the acoustical characteristics outlined above. That is, over an array of acoustical modalities, JALC generally privileges intimacy, proximity, and interaction over “blend.”

But we should not be tempted to dismiss “classical” sound ideal(s) too quickly. For one, many of the acoustical characteristics I’ve been discussing—especially intimacy, immediacy, and clarity—are as much a part of the listening ideal in most classical art worlds as they are at JALC. Indeed, by emphasizing the acoustical communication of nuanced rhythmic, melodic, harmonic, and timbral details without coloration or distortion, the ontology of jazz conjured at Rose is imbricated with a constellation of musical values underwritten by the “supposedly universal standards” of western art (Monson 1996, 136). The jazz that is played in Rose Theater is meant to be appreciated for its complexity and sophistication, an endeavor of “deep study and concentration” (Marsalis 1988). And it requires an appropriately pure and clean acoustical environment.

Where does reverberation fit in here? As discussed above, the most important single acoustical factor in the room's design was a shorter reverberation time than a typical concert hall, to account for jazz's assumed propensity for transient sounds. Recall that Marsalis's assertion that "the biggest thing was to make sure the tail is not too long—but that there *is* a tail." While aligning with acoustical common sense by espousing a "not too long" reverberation time, Marsalis tempers this desire by resisting the "really dry" aesthetic more typical of a jazz club, thus revealing at least two unexpected assertions: (1) he doesn't want *his* jazz band to sound like it's in a club—or, as he told me elsewhere—"jazz doesn't have to be played in a smoky basement" (W. Marsalis, pers. comm., April 13, 2019); and (2) Rose should, because it's a "big" concert hall, exhibit a degree of allegiance to concert hall expectations through some "volume" and "liveness." Indeed, though Marsalis has been firm in stating that this room would be made "for us" rather than classical music, a good deal of his inspiration came from the classical world. As Derek Gordon, one-time executive director of JALC, told an interviewer, "The hall is based on Wynton's thoughts about European houses and their golden sound" (Gallo 2004). Marsalis was even more specific in an interview with the *Chicago Tribune*, asserting his desire for "the type of golden sound that orchestras have in the best concert halls," while bemoaning the downsides of the usually corresponding reverb "tail" (Reich 2002).

By repudiating jazz club aesthetics while partially aligning with the classical concert hall, Marsalis says much about the proper "place" of jazz. Rejecting the dryness of a club while opting for a modified sonic-symbolic grandiosity of a classical concert hall, Marsalis deploys acoustic concepts to mediate his particular version of the ideology of jazz as art. He has long condemned the "romance" of the "smoky jazz club" as a debilitating stereotype that has, along with racialized tropes of Black musicians as unstudied and vice-prone, restricted jazz and jazz

musicians' access to the loftier spaces of the art world. Having "emancipate[d] jazz from the basements of the American imaginary" (Laver 2014, 552), not only has Marsalis and his JALC constructed a physical space that looks and feels like a classical hall—one sanctioned by a revered "European" cultural institution (Lincoln Center)—but one that shares important sonic characteristics with such a hall.

In the end, Rose's acoustics lie at an uneasy balancing point between a variety of approaches to acoustical sound. As it turns out, then, the acoustic aesthetic "etched into" (Gieryn 2002) the Rose Theater was not so much a revolutionary or transgressive assault on the classical concert hall tradition—indeed, it was never meant to be—but more a jazz-specific "riff" on that tradition. Which isn't to say that Rose is just a classical hall or opera house by another name. For though JALC didn't create a room *exclusively* for jazz, the room *was* indeed made specifically, and quite *sincerely*, for jazz in many meaningful ways—ways that reflect the particularistic ways that JALC its leadership defines the music and its meaning. JALC nonetheless enrolls many aspects of classical acoustics, and its aura of universalism, into its overarching art-world mission of establishing jazz at the heart of the US's problematic cultural hierarchy. By listening closely to this room, I have heard new ways that the act of defining and debating the ontology of jazz is not only a contest of words, or even music, but also a matter of sound in its most material form.

Chapter 2: “Some Rooms Make You Whisper”: The Art of Isolation and the Racial Politics of Quiet

This chapter is the first of three that grapple with the idea of “pure and clean” sound, a flexible and wide-ranging trope I encountered, in various cognate forms, many times and across numerous sites in my fieldwork (e.g., D. Hosney 2016, pers. comm., December 19, 2016; J. Uhl, January 20, 2017). In these chapters, I investigate how such ideals are thought about and materialized through mechanical vibrations, assemblages of physical matter, and the electroacoustic technologies that tangle them together. I analyze these materials for their intersections with musical genre, human social life, and especially systems of racial difference. Each chapter is organized around a particular technology or approach to sound. This chapter focuses on acoustic isolation, chapter three on electroacoustic sound reinforcement, and chapter four on sound system design and optimization.

Like the previous chapter, this chapter is ethnographically situated at Rose Theater, the largest and most prestigious performance venue at the lavish multi-use performance complex in New York City that serves as the material and symbolic home of Jazz at Lincoln Center (JALC; see Figure 2.1 and Figure 2.2). I show how Rose Theater was constructed with an elaborate form of acoustic isolation that dramatically seals it off from the rest of the vibrating world, fostering a remarkably quiet aural experience. I propose the room’s stunning quietness as an occasion to creatively rethink the power of sound—musical or otherwise—to negotiate racial feeling and politics. I show that by dramatically cutting off the sounds of jazz from the world outside, thus excluding unwanted “noise”—a concept I consider in both its sonic and social resonances—JALC deploys acoustics to challenge longstanding racist ideologies that associate jazz with a noisy material essence. I further find that Rose Theater’s acoustic isolation is a powerful sonic

component of JALC’s broader project of carving out a space for jazz in a Euro-American art-world hierarchy that has long been unwelcoming to Black cultural production. While I commend JALC’s moves as valuable interventions in the US racial imagination, I also find in them a more conservative political gesture. Namely, by actively promoting a studious mode of attentive listening inspired by Eurocentric frameworks of high “art,” the acoustic space of Rose Theater becomes entangled with a western concert culture tinged with whiteness and deaf to the many alternative spaces creative Black musicians have used to more effectively challenge the racial geographies of musical art worlds.

But let us first focus on what it *feels* like in Rose Theater.



Figure 2.1: Time Warner Center, JALC facility, exterior

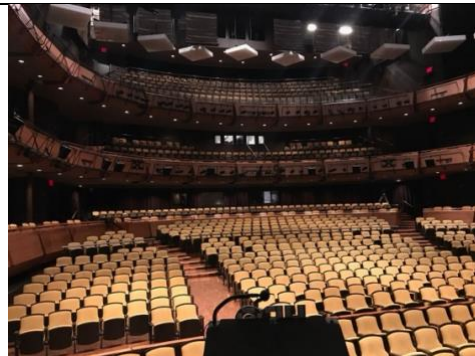


Figure 2.2: Rose Theater, view from the stage on a typical workday

2.1. “Walls, Largely Unbreachable”: An Ethnographic Entry

I stand alone on the deep black stage, looking out upon a house at rest. I breathe, bathed in penetrating silence. And darkness. I’m the only one here. I feel no human bodies. I hear no talking. The swarms of nonhuman bodies that usually hum, clash, scratch, and buzz around me—the machines, artifacts, tools of all types—lie still, lifeless. My body is paralyzed by a preconscious anxiety at stirring the restful scene. I try not to make a sound, fearing someone might hear and ask me who I am and what I’m doing here. Where is everybody?

Minutes before this striking solitary moment, I found myself enveloped in an entirely different sensorium. The midday July sun danced off passing cars and the imposing glass exterior of the Time Warner Center. It was one of those days you squint compulsively to avoid the pain of the sun, even with sunglasses. The light shimmered on the small steel plaque reading “Jazz at Lincoln Center Stage Door” on West 60th Street, between Columbus Avenue and Broadway. This was the first wall I encountered on my brief journey to the material and symbolic center of the JALC world.

Pulling back the door exposed an unglamorous, dimly lit tunnel leading toward another, less ponderous door. It opened onto a kind of alcove a little smaller than a one-car garage. In this liminal space between the exterior cityscape and the inner sanctum of Rose Theater lived a security station and a pair of brushed steel elevators. As usual, an assortment of big black road cases sat on the floor by the elevators, likely filled with rented audio gear or instruments waiting to be stowed in their proper places. Already I was far away from the sun-drenched, high-decibel streetscape.

I nodded at the security guard, who barely looked up. Earlier formalities, like asking for ID and checking my name against the list of approved visitors, had faded away after only a couple weeks of showing up every day for fieldwork. For the past couple months, I’d been following the same work schedule as the Rose Theater audio crew. The hours were long, usually upwards of 80 per week, and sometimes many more. I thought today would be like any other day in the field.

I made my way to the elevator while an antiseptic fluorescence accompanied me to the fifth floor. The brightness only increased as I exited the elevator onto a network of backstage hallways connecting the spaces where almost all the daily life of technical staff takes place.

Taking a left would lead first to JALC's recording and rehearsal studios. A little more maze-running would lead to offices, IT and audio/video infrastructure, equipment storage (including some all-important microphone lockers), and, probing further, the backstage area of Dizzy's, JALC's jazz club—its smallest venue.

But I was headed for Rose, so I turned right, soon encountering the door of Wynton Marsalis's "Artistic Director's Suite," tucked into the corner formed as the hallway turns left toward the Rose Theater's stage left door. The suite is a kind of tricked out private dressing room, complete with bathroom, mini-kitchen, lounge area, and Steinway grand piano. This is where Marsalis hangs out before rehearsals and on breaks (assistants delivering Starbucks coffee and Chinese takeout was a common sight), waiting till the last minute to shuffle to the stage, ensuring he's last to arrive. (As I observed many times, Marsalis is a virtuoso at making an entrance, even for a rehearsal. He's also quick to leave the stage when the music stops, promptly making his way back to his suite. That is, if there isn't any backslapping with friends or donors to be done. (There usually is.)

I took a left outside this door and walked the same path Marsalis would take toward the stage. On my right, I passed dressing rooms, technical staff offices, and white walls strewn with press clippings, posters, crew call sheets, and safety notices. As I walked, the left side of the hallway opened up into a spacious plot of flooring laid out in front of the building's massive freight elevator. Normally there'd be plenty of activity here, especially since a new production was coming in this week, which usually means boxes and boxes of gear and heavy equipment. For whatever reason, it didn't register to me that there was no one there. Nor did I take any particular notice that I hadn't encountered *anyone* since the security guard downstairs.

The door opening into to the theater’s backstage area was heavy and thick, and it needed to be. For it was one of only a handful of portals between two carefully segregated sensorial worlds. The first was an exterior world of elevators and hallways and offices and bright synthetic light, not to mention, just a little further away, the city outside and thus the rest of the world. The second was a much smaller, much more controlled, interior domain enclosing JALC’s material and symbolic nucleus: Rose Theater. Before passing through the door, I was in the first world. Here, the floor that suspended my feet five flights above the street, and another handful of flights above a bustling subway hub, was rigidly articulated within a vast material network of rigid objects—and the quivering gases flowing between them. Girders, stairways, elevators, subway lines, the Columbus Circle mall—between any of these objects, one could trace a direct chain of solid artifacts to the floor beneath my feet. Any vibration in this network of solid matter might trace its way to any other place in this assemblage. The same would not be true on the other side of this door.

To the designers of Rose Theater, these networks of vibrating objects presented a number of difficulties. They worried, for instance, that vibrations from a passing subway train might be felt and heard up here. Or the mechanical racket of elevators and all sorts of other potentially distracting sounds. Of course, one would have to listen closely to hear any of this, especially in the hallway where I was presently standing. Here, any number of ambient sounds—the hum of the lights, the delicate hiss of air conditioning—would mask the subtler, more distant trembling from the farther corners of the network.

But on the other side of the door, inside the theater, the environment would be entirely different. For JALC’s distinctive approach to presenting live jazz required the highest standards of acoustic isolation; the slightest trespass of exterior sounds might well disturb the “pure and

clean” sonic environment JALC wanted to cultivate (D. Hosney, pers. comm., December 19, 2016). The jazz within *these walls* must be cut off from all outside noise.

Rose Theater is what theater designers and acousticians call a “box-in-a-box,” an impressive and rare feat of architectural audacity. This means that the entire theater is enclosed within a roughly box-shaped structure physically autonomous from the rest of its surrounding architecture (see Figure 2.3). Which is to say that the rigid network of solid materials connecting my feet on the hallway floor to the city outside and subway lines below does not extend to the theater itself. From the top of the box, suspension cables stabilize the box, but the bulk of the mass rests upon a handful of mighty rubber pads that dissipate vibrational energy. Along all six sides of the box runs a gap of at least four inches of air, separating it from the rest of the building.

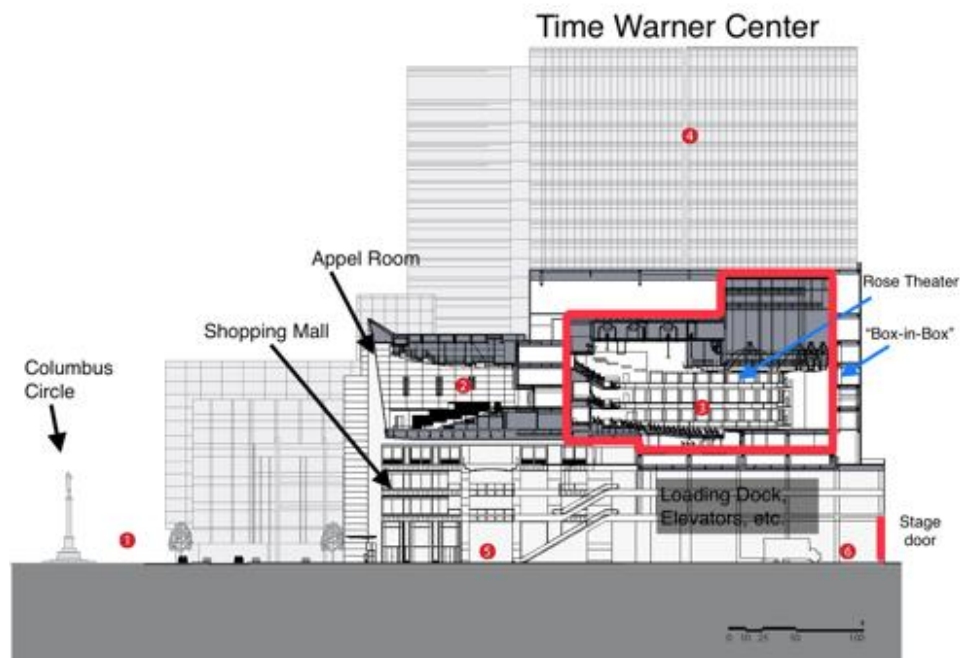


Figure 2.3: Rose Theater's "Box-in-Box" construction and its articulation with its material surroundings. Illustration adapted by the author from original provided by Ralph Viñoly Associates

As I opened the door and walked in, I stepped over a strip of flat steel concealing the four inches of air separating Rose Theater from the rest of the world. Because such a gap surrounds

the entire theater, everyone who enters, from any entrance, must walk over a similar gap. I took another step and the door closed behind me, thus completing my entry into the box. I'd expected to find the lights on, revealing the expanse of the theater—the dark curtains; the worktables and boxes; the electrical cabling running along the backstage walls; the soft sheen of the matte black backstage floors. Walking onto the stage and looking out into the house, I'd normally see wood-paneled balconies, floors, seats, and walls. There would be chatter and the sounds of human labor: metal scraping and clanging on the floor, boxes scratching across the stage, motorized ladders lifting stagehands to tweak a light or loudspeaker.

But there was none of this. Virtually no sound at all. And barely any light—not even enough to discern the mustard yellow of the seat cushions or the mahogany brown of the floors and balconies. And no human was there, no one backstage, on stage, in the house, or in the array of tech booths lining the rear wall of the house. That's when I realized there would be no work today. No load-in, no setup, and certainly no show. In the flurry of late nights and early mornings, I had apparently lost track of the schedule. Or the schedule had changed last minute, and no one told me about it. Whatever the reason, I was the only one there. Feeling the tinge of transgression, I didn't want to stay long. But I took a few minutes to soak in the otherworldly silence and ineffable isolation from the outside world.

I had arrived where I started this narrative: dark, silent, and alone.

The hush was deeply affecting, its starkness intensified by the scratches and squeaks of my sneaker-clad feet against the dull black floor of the bare stage. Against the silence and isolation of the room, these subtle sounds of bodily motion took on new life. Closer, more immediate, present. With striking clarity, I heard the subtle reverberant responses of the room, whispering back at me, my feet, and the floor. With such a low “noise floor,” as technicians call

it, and such a thorough detachment from the sounds and sights of the outside world, there was something unmistakably isolating and isolated about the feel of the room. In this piercing darkness, accompanied only by the subtle, obscure whispers of my own footsteps and their reverberant afterlife, I found myself in a different world from the blaring brightness and clamor of the city streets that now seemed so far away.

What is more, the room *made me quiet*. One of the theater's designers had told me a principal goal was to provide musicians with a "blank canvas" of silence, but I had rarely stopped to *feel it*. It made me attentive, and not only to the subtle rustlings of my own body, but the spectral whispers and movements of the bodies I vaguely sensed, or even more vaguely feared, might be sensing my presence. While I was literally on a stage, I would have felt the same anywhere in the room—as if my whole body were on display, a disembodied object suspended in naked space to be scrutinized by some even more disembodied observer out in the obscure non-space surrounding me.

2.2. "The Great American Noise": Jazz, Race, and the Politics of Silence

My dramatic aural experience evidences the painstaking care that was invested in assuring total sonic isolation of Rose Theater from the rest of the JALC complex and the complex from the rest of the building (and building from the city, and so on). The room's designers emphasized that "every aspect of [JALC] has been designed to *control intrusive noise*" (Marsalis and Fierce 2004), creating "a silent atmosphere that maximizes the clarity and richness of sound, provides ease of concentration and communication between performers and allows for the greatest audible dynamic range of sound" (Doria 2005, 49). Doug Hosney, JALC Vice President in charge of the whole facility, described the lengths designers went to shield unwanted noise sources—from mechanical building noise to elevators to subway lines below—as an

elimination of “potential conflicts with pure listening” (D. Hosney, pers. comm., December 19, 2016).

We find in these words, and the material formations they describe, both a system of sonic values and a theory of listening. Silence, mediated by physical sound isolation, affords “pure listening,” where putatively universal aesthetic ideals of “clarity and richness,” “concentration and communication,” and great “dynamic range” are shielded from threat of “intrusive noise.” In the pages that follow, I explore this cluster of concepts through the lens of race, showing how acoustics and architecture contribute new ways of creatively interrogating the role of sound, music, and listening in structuring human difference. This discussion will be oriented around two unstable axes: (1) “noise,” and a few related tropes threading through racialized ideologies of Black sound and sounding, and (2) western ideas of art (equally racialized, but by covertly so), its autonomy from human social action, and culturally specific regimes of sober, concentrated listening. My analysis will allow new thinking about how seemingly neutral ideas, practices, and materialities are articulated within questions of difference and power.

Such an approach requires a nuanced concept of noise, one intersecting the sonic, epistemological, and racial. Like Jennifer Stoever, I find noise useful as a “shifting analytic that renders certain sounds—and the bodies that produce and consume them—as other” (Stoever 2016a, 13). Noise represents disorder, irrationality, primitivity—a host of unwanted and often feared potential disruptions to the more controlled and reasoned domains of modernity and liberal humanist subjectivity (Attali 1985; Novak 2015). Sonic or otherwise, noise disrupts purity, order, and expectation—at least as those concepts are constructed within the putatively “unmarked” western perspective (white, male, heterosexual, etc.). Noise threatens stability and normality. It disturbs. Noise is thus overrepresented in racially marked human subjects, groups,

and epistemologies (Stoever 2016a; Stoever-Ackerman 2010; Cheng 2018; Rose 1994; Radano 2000, 2003, 2016; James 2019; Radano and Bohlman 2000).

In the tangle of ideologies so crucial in constructing Black music as a category, we find noise not only as a mediator racial otherness, but a powerful source of cultural solidarity, aesthetic beauty, and political force. As I discussed in my introduction, in Fred Moten's rendering, an "irreducible materiality" marks Black (radical) performance with a "material trace" of both the torture of slavery and the foundational "scene of objection" where Black sound's irrepressible "freedom drive" is expressed through the scream, shriek, or cry of resistance. This resistant materiality "challeng[es] the reducibility of phonic matter to verbal meaning or conventional musical form" (6), and thus disrupts western modernity's systems of liberal rationality, individual subjectivity, commodity exchange, and linguistic signification. In music, one place one might find such sounds "in the cracks" of western music—the grunts, the growls, the "grain" of the voice (Sterne and Barthes 2012; Floyd 1995). "Noise" is one of the many terms Moten uses to describe the resistant qualities of black sonic performance, but it certainly does not contain his wide-ranging intervention. What is key for the current argument is Moten's proposal of a black radical aesthetic in which discordance, incomprehensibility, instability, "wildness," and "cacophony" (Harney and Moten 2013)—and a range of other notions hardwired into the western racist imagination—are mobilized as vital modes of opposition and distinctiveness.

In jazz, noise has undergirded a racist logic of sonic and bodily otherness that has clung to the music since its very beginnings. As Emily Thompson (2002) states: "At the foundation of debates over the musical and cultural value of jazz was an assumption of a fundamental dichotomy between music and noise. Music was legitimate sound and noise was not. Music was

harmonious, regular, and orderly; noise was discordant, irregular, and disorderly” (132). Indeed, sonic metaphors of noisiness and cacophony, intertwined with perverse fantasies about Black bodies as physically and sexually excessive (and intellectually bereft), were crucial to the reactionary outrage jazz inspired in many white US-Americans. Whites concocted fears over racialized notions of infection, degeneracy, and moral plague, in which the “noisy” sound of jazz itself carried along with it an indelible racial essence (Ogren 1989; Merriam 1964; Lopes 2002).

2.2.1. “A Low Noise in a Low Dive”: Basements, Clubs, and the Racial Imagination

Spaces of jazz performance have been particularly subject to racial marking. A signal example is found in the 1918 editorial “Jass and Jassism,” published in the *New Orleans Times-Picayune*—the “official record of the city’s jazz white establishment” (Rich 2018). The piece revolves around an extended architectural metaphor linking sound, race, and space: a “house of muses” composed of discrete physical chambers for different types of music and sound. On the top levels are the two upper “mansions”: (1) the “great assembly hall of melody,” which has the greatest number of seats and is home to popular “tunes,” and (2) “the inner sanctuaries of harmony,” hosting “all the truly great music.” Lurking below we find not a mansion but an “apartment... down in the basement, a kind of servants’ hall of rhythm.” This subterranean space is suffused with sounds deemed racially and morally inferior, especially jazz. In this chamber dwell

those most devoted to the cult of the displaced accent...[,] a brotherhood of those who, devoid of harmonic and even of melodic instinct, love to fairly wallow in noise. On certain natures sound loud and meaningless has an exciting, almost an intoxicating effect, like crude colors and strong perfumes, the sight of flesh or the sadic pleasure in blood. To such as these the jass music is a delight, and a dance to the unstable bray of the sackbut gives a sensual delight.... (*Times-Picayune* 1918)

By evoking perceived animalistic exhortations and crazed “sensual delight” as the hallmarks of a racially debased “cult of the displaced accent” holed away underground, this editorial exemplifies some of the most long-running stereotypes of jazz, race, and space.

Basement or not, spaces of jazz performance have been permeated with signifiers of disordered, sensual, or primitive sound. These “spaces of otherness” (Radano and Bohlman 2000) have long evoked allure, trepidation, sexuality, and a range of other seductions and indignations for whites and others (Heap 2009; Burke 2008). Historically, this phenomenon is most iconically represented by the exoticization of small establishments in urban centers such as New Orleans, Chicago, and New York in the first half of the twentieth century—especially “red light” or “vice” districts populated largely by people of color (Ogren 1989, 56–86; Heap 2009; Peretti 2007; D. L. Lewis 1997; Kenney 1993). Iconic examples include speakeasies, “jooks,” nightclubs, “black and tans,” cabarets, and other nightlife haunts. Jazz history frequently highlights particular urban neighborhoods like New Orleans’s “Storyville” (or, as it was more commonly called, “the District”; see Ogren 1989), Kansas City’s Eighteenth and Vine District (Driggs and Haddix 2005; Clifford-Napoleone 2018), Chicago’s Brownsville (Kenney 1993; Heap 2009), and New York’s Harlem, though these four represent a tiny fraction of iconic jazz scenes in the US (Berish 2018) and abroad (Bohlman and Plastino 2016; B. Johnson 2020). These and other romanticized sites prompted Paul Whiteman and Mary McBride to refer to jazz as “a low noise in a low dive” (1926, 15).

In the late 1930s and early 1940s, the rise of certain strains of small-group swing and bebop became associated with new small-venue subcultures in which dancing and other modes of participatory physicality were deemphasized, sometimes because of limited floor space (Burke 2008, 28). In many cases, such trends coincided with an ascendant discourse of artistic autonomy

and attendant cultures of careful listening and appreciation. But while many bebop innovators embraced aspects of artistic modernism to assert a seriousness and value for their music, western notions of aesthetic universalism only went so far. Indeed, bebop demonstrated a transgressive, experimental edge, in no small part undergirded by an oppositional Black political aesthetics, one whose musical characteristics were tied intimately with the type of performance spaces where it developed (see Jones 1963; Lott 1988; Ramsey 2013; G. E. Lewis 1996). Whether in sequestered after-hours Harlem jam sessions or in more commercially lucrative (and whiter) midtown clubs on 52nd street and elsewhere, bebop maintained a racialized otherness linked to—though not exhausted by—its “willfully harsh, anti-assimilationist sound” (Jones 1963, 181).¹ Embracing ideals of technical virtuosity and musical complexity (harmonic, rhythmic, and so forth), bebop seemed ideally suited for smaller spaces where attentive listening and subtle interactions could be fostered between tightly spaced bodies (DeVeaux 1989).² Thus, in small mid-century clubs, many located in brownstone basements, the trope of the black male improviser flourished as a literal “underground” hero.

Yet with all its capacity for musical and social negotiation, bebop was also linked to “troubling primitivist notions of black masculinity” (Ramsey 2013, 29). To many listeners—and especially white male musicians (Burke 2008)—the allure of black male sounding refracted not only through the prism of western aesthetic values but also through romantic tropes of outsider iconoclasm and black masculine “hipness” (Monson 1995). Further, the rise of bebop reproduced the age-old gender-racist notion of the black male as a “natural” creative hero, even if such

¹ On the 52nd street as “whiter” than the Harlem scene, see Ramsey (2013, 26); Burke (2008).

² For these experimentalists, the club setting provided a degree of isolation from the pressures of the wider commercial markets while enabling close listening and the cultivation of a dedicated following of “insider” fans (Ramsey 2013; Crawford 2001)

discourses overlapped with western-inflected tropes of the individual genius (Burke 2008; Monson 1995; Gioia 1989).

Compounding such fantasies was a mix of counter-cultural trends and sexual practices associated with new youth cultures, prompting backlashes from the dominant (white) culture. As Guthrie Ramsey (2013) puts it, 1940s bebop clubs formed a

social frontier in race relations [that] highlighted the fear of miscegenation as once segregated audiences began to fill with black (and white) hipsters (or ‘zombies,’ as they were also called). Zoot-suited, long-haired, and reefer-smoking, these black hipsters quite publicly undermined the Street’s entrenched ‘white bachelor subculture’ by openly dating and showing authority over white women. (29; see also Kelley 1997).

At the same time, observers outside the “insider” bebop scene struggled to make sense of the sounds in these clubs—sounds that the mainstream press, and many jazz critics, responded to with fear and incomprehension (e.g., *Time* 1948). The challenging sounds of bebop enmeshed in a sensorial environment in which drink and smoke (certainly not limited to tobacco; see Enstad 2016) flowed liberally and distinctive forms of speech and dress distinguished insider and outsider, endowing jazz with a countercultural edge that has lived on, in different forms, to this day.³

2.2.2. “The Outlaw Thing”

Wynton Marsalis has made it a point to resist many of the exotic associations with small clubs I have noted. In a 2001 interview about the then-under-construction JALC performance complex, he told the interviewer: “Who says [jazz] has to be played only in dark rooms filled with curls of cigarette smoke? Always on the margin. That outlaw thing. That’s a romantic,

³ For academic work that discusses (and reinforces) stereotypes of deviance, “outsider” behavior, and other forms of pathology in mid-century jazz communities, see Becker (1951, 1966); Cameron (1954); Merriam and Mack (1960). For critiques of these tropes, see Monson (1995); Lopes (2005).

limiting fantasy. This is the greatest music ever produced in this country, made by the greatest musicians. You think it doesn't deserve something first-class, like any other great art?"

(Jacobson 2001; ellipses in original). Indeed, though Marsalis has been on the record praising some smaller clubs (even the "shabbiest ones"⁴), he resists stereotypes that constrain jazz to any marginalized "proper" place. He holds a particular aversion to basements.

For example, I once asked Marsalis about the acoustics of the Village Vanguard, certainly New York's most iconic (and oldest) jazz club—which jazz critic Nat Hentoff (1980) once called "the closest we have to the Camelot of jazz rooms" (2). I knew that Marsalis had led a field trip to the club during the design phase so the technicians could get a feel for the room's well-loved, famously low-reverb acoustics (C. Darland, pers. comm., March 20, 2019; E. Arenius, pers. comm., March 20, 2019; D. Doria, pers. comm., April 8, 2019). I also knew Marsalis had recorded numerous live albums at the club and held it in high esteem, both for its acoustics and its symbolic position in jazz history. Yet his answer to my basic inquiry revealed an important ambivalence.

"I don't like necessarily dry clubs," Marsalis told me. "The Vanguard is different. It's its own space. Like, it's legendary for its own reasons. And, yeah, it's fantastic sound, but it's very characteristic of *it*." Here, the Vanguard is the exception that reinforces the rule: Marsalis has no particular love for low-reverb spaces, but the Vanguard's sound deserves recognition because it is "characteristic of," and thus discursively linked to, a physical site that is surely the most celebrated jazz venue still in operation (see Wetmore 2020). A primary sticking point, as it turned out, was Marsalis's association of dry acoustics with basements.

⁴ Marsalis told Paul Berliner (1994), for instance, "the shabbiest little room can be great...if the people, the vibes, the feeling, the love is there" (452).

When describing his desires for Dizzy’s Club, the smallest of JALC’s three performance venues, Marsalis told me: “It’s [on the] fifth floor, above ground. It has to be *live*. It can’t simulate a basement or the thought that everything should be in a basement or some smoky club—some kind of romantic vision that this is what the club was in, that this is what jazz *belongs* in” (W. Marsalis, pers. comm., April 13, 2019). Here, sound mediates both aesthetics and ethics. To Marsalis, a “live,” reverberant acoustic environment indexes physical and symbolic *elevation*, a sonic transcendence of limiting essentialisms about where jazz “belongs.” Marsalis is particularly suspicious of acoustically dry environments for their semiotic links to the “romantic vision” of subterranean marginality, bound up in “romantic visions” of nonnormative black masculinity—“the outlaw thing” that limits jazz, in Marsalis’s view, from attaining its rightful place in the rarefied realm of universal “art.” In contrast, a more reverberant sound signifies an elevation that lifts jazz above both its physical surroundings and their related networks of social meanings and structures.⁵

Similarly, Rose Theater’s extreme acoustic separation from outside sound firmly repudiates not only the basement club stereotype, but an entire range of racial markers of noise and primitivity. Through sound, JALC articulates jazz as a quasi-autonomous object of aesthetic appreciation,⁶ separated both from the sonic worlds beyond the theater’s walls and from primitivist notions of jazz as noisy disorder. The sound further repudiates essentialist notions of

⁵ As numerous authors have discussed, various aspects of western aural imagination have widely associated reverberation with transcendence from everyday social life and a general “sense of being in another world” (Blessner and Salter 2012, 190; see Blessner and Salter 2007; Thompson 2002; Beranek 2004; Schafer 1994). Similar ideas are found in recorded music (primarily classical music; see Doyle 2005).

⁶ Mark Laver (2014) is even more metaphorical, asserting that JALC has “worked to emancipate jazz from the basements of the American imaginary: to cleanse it of its insalubrious history and, in the edifice at the corner of Broadway and West 60th Street, erect a monument to what African Americans can ostensibly achieve through the neoliberal alignment of individual, government, and corporate interests and efforts” (52).

jazz's fixed "place" in racially marked city streets, neighborhoods, or venues, underlining in steel and concrete the solidity with which the music is now affixed in US modernity. Within these walls, a listener would be hard pressed to imagine the same sounds in a small jazz club, and even harder pressed to imagine the grainy fugitivity and fantastical racial primitivity associated with underground jazz clubs and the mythology surrounding them. Separated from distractions, cut off from real and imagined excess of nightclub sound, jazz can no longer be said to "wallow fairly in noise," as the above-cited New Orleans editorial stated a century ago (*Times-Picayune* 1918). Jazz has become, as I will elaborate in the next section, an object of serious contemplation and evaluation—reflecting the "pain of study" Marsalis (1988) firmly believes the music requires.

2.3. "Some Rooms Make You Whisper": Jazz, the Concert Hall, and (White) Listening

But JALC's acoustic segregation not only challenges negative stereotypes but asserts a new set of sonic signifiers. In this section, I explore how acoustic isolation conjures a high-art experience articulated within ethnocentric western frameworks. I outline historical and epistemological connections with western ways of thinking about music and its sites of performance, while placing JALC's efforts in a wider history of concert hall jazz. I thus shift away from discussing what JALC's acoustic isolation says about what jazz is *not*—a disordered and racialized "noisy" sound—and toward what it says about what jazz *is*: a western-style high art demanding attentive listening. I will ultimately build on this discussion to express my concern about how such ideals articulate jazz into western epistemological and aesthetic systems that privilege a colonizing white, male, bourgeois perspective.

2.3.1. Museum Listening and the “Music Itself”

In the classical world, concert halls have played a significant role in physically and symbolically disconnecting musical performances from their surroundings and positing “the music itself” as an object to be appreciated and evaluated with disinterested contemplation (Small 1998; E. A. Thompson 2002; Blesser and Salter 2007b; Cressman 2016; J. H. Johnson 1995; Schafer 1994). Consider Lydia Goehr’s (1992) exploration of the concept of the musical “work” in the European classical music. This ontology, which ascended around 1800 according to Goehr, distinguishes idealized works from their social, bodily performance, a distinction linked to particular modes and contexts of reception:

Like performers and conductors, audiences were asked to be literally and metaphorically silent, so that the truth or beauty of the work could be heard in itself. But such attention was possible only if music was performed in the appropriate physical setting. For how could one listen attentively and in silence if there were distracting elements all around? Performances had not only to become foreground affairs, but they also *had to be cut off completely from all extra-musical activities*. It was with these sorts of ideas in mind that concert halls started to be erected as monuments and establishments devoted to the performance of musical works.... In these buildings, as well as in the private ‘museums’ or societies, audiences began to learn how to listen not just to music but to each musical work for its own sake.... The general desire for a quieter, more considerate, and more attentive audience was part and parcel of the growing respect for a new and ‘civilized’ musical event. (Goehr 1992, 237–38, emphasis mine)

R. Murray Schafer (1994) similarly proposes the concert hall as a “container of silence” that makes “concentrated listening possible, just as the art gallery encouraged focused and selective viewing” (117; see also Cressman 2016; J. H. Johnson 1995; Small 1998; Kaye 2012).⁷ The ontology of musical works, as well as broader western notions of autonomous musical aesthetics,

⁷ A common metaphor, relevant here, likens the concert hall, and its cultures of serious contemplation, to a museum. For example, Richard Taruskin (2010), in his mammoth survey of western music, “Great works of music, like great paintings, were displayed in specially designed public spaces. The concert hall, like the museum, became a ‘temple of art’ where people went not to be entertained, but to be uplifted” (2010, 650). See also Kivy (1995); Alper (1991); Cressman (2016).

coevolved with corresponding modes of appreciation and new material spaces to facilitate and encode these new expectations.

2.3.2. “Like a Class”: Rose Theater

The quiet isolation of Rose Hall demands polite attention. And when the house lights go down, the stage lights go up, and the band walks out on stage, there is no doubt where all the bodies in all the seats pointed in the direction of the stage are expected to place their attention. Though the idea of sounded participatory interaction between stage and audience was taken seriously in the room’s design, the overarching sense of silence and ceremony a patron encounters in Rose Theater provides a distinct feeling of western art-world formality. Like a symphony hall or the opera house, Rose Hall is a place to take music seriously. It is not a place for talking, or smoking, or drinking, or any other extracurricular activities. In Marsalis’s words, the room itself, and its sound, says, “this is important. It’s not an afterthought. It’s not, ‘this basement happens to sound good—let’s go there and smoke and talk over it’” (W. Marsalis, pers. comm., April 13, 2019). Of course, this ceremonial feeling is conditioned not only by sound. The elegant material surroundings that one sees, touches, and even smells all contribute to Marsalis’s vision, cited earlier, that jazz “deserve[s] something first-class, like any other great art” (Jacobson 2001). The place looks and feels just as expensive as its \$130+ million price tag.⁸ But on concert night, it is sound that most powerfully conveys the sense of leaving the outside world behind, of focusing on music as a serious and autonomous experience.

⁸ Most official estimates, and those published in the press, hover around \$130 million (e.g., Ratliff 2004), though numerous interlocutors intimated that the figure ballooned much higher (and JALC didn’t want the real number known) (see, e.g., S. Berkow, pers. comm., February 26, 2019).

This is especially true when, lights down and all chatter hushed, Billy Banks, Marsalis's long-time road manager, gets on the "Voice of God" microphone to introduce the Jazz at Lincoln Center Orchestra, JALC's house big band, which performs in Rose Theater far more than any other group. The "VOG mike," as the stagehands call it, sends sound to the listeners' ears from all directions, from all speakers throughout the room, destabilizing any illusion of an individual human body as sound source. Banks's voice, extricated from his body, becomes a voice from everywhere and nowhere, a subjectless abstraction dramatizing the room's detachment from all that lives outside its confines. The band members enter with an informal demeanor but formally dressed in sponsor-provided Brooks Brothers suits. Marsalis introduces tunes and band members with a smile, and usually a joke. But when the music is playing, the audience remains stolidly seated and silent.

This is a routine I observed many times. Head sound engineer David Gibson has seen it many more times, perhaps more than anyone, during his nineteen-year relationship with JALC. We once had a discussion about a very atypical concert with a lot of crowd participation (D. Gibson, pers. comm., April 4, 2019):

DG: All the head bopping and in-seat dancing going on in that show [an atypical concert]—it was very unusual here.

TW: Really?

DG: Yeah. I don't see that here. You won't—you *will not see that here*. You're going to see a large number of older patrons sitting very, uh, respectfully in their seats listening to music. I doubt that you will see head bopping. If you do, you won't see anybody rocking to the music. It's much more like a class.

Indeed, as pianist Fred Hersch told me, "When you're at Jazz at Lincoln Center, as soon as you're in the room, you *know* that you're going to a *concert*" (pers. comm., September 29, 2017). Hersch is specifically referencing a western classical tradition of attentive formality and contrasting it with the more informal environment of smaller venues and clubs. As Christopher Small (1998) writes about the classical world, "concert audiences pride themselves on their good

manners, on knowing their place and keeping quiet” (27). JALC audiences behave similarly, generally dressing well, never talking during the music, and nearly always waiting patiently to clap or vocalize until after solos or between tunes. Quite rarely, an especially impassioned patron might vocalize or clap mid-solo when a particular moment grabs their attention. While this is common and often expected in smaller venues, such expressions feel out of place in Rose, not least because they occur infrequently and rarely inspire others to join in. Most important, the quiet of the room, and the polite hush of one’s fellow patrons, amplifies the potential social awkwardness of making any sound, thus subtly heightening the social repercussions for anyone who might breach the unwritten code mandating silent attention. Though the room’s “blank canvas” can and does afford the occasional moment of striking interpersonal interaction, it far more frequently results in a quiet, museum-like atmosphere redolent of Goehr’s ideal atmosphere for appreciating “works” of fine art.

But if one’s desire is to hear big band jazz in an environment that allows one to clearly hear musical details like harmonic voicings, rhythm section interplay, interplay of lines between voices and sections, or all the notes and nuances of a solo (which is rarely a given in live performance)—and to do it in a big room—it’s hard to imagine a better environment than Rose. The important point is not only that this material environment encourages a western-art posture of attentive listening, but that it changes the musical sounds themselves to be more in line with western art values.⁹ The sounds that enter the listeners’ ears *are different* in this room than any other, tailored to particular aesthetic and ethical judgments about the salience of particular musical characteristics and the normative approach to recognizing and appreciating them. In this

⁹ As one acoustician on the design team told me, “It’s critical to keep the room quiet. We believe you basically give musical artists a *canvas of silence*” (C. Darland, pers. comm., March 20, 2019).

silent, serious room, the music is heard—and thus becomes—a detailed and “sophisticated” expression to be adjudicated on the same universal standards as western “masterworks,” with all the social prestige that comes along with such a status.

For the past few pages, I have been discussing JALC’s purposeful attempts to construct a “concert hall” environment of quiet listening as a way of associating with specifically western modes of conceptualizing music, its performance, and its reception. Within the overall argument of this chapter and this dissertation overall, I am building up to a case about how pretenses of musical/sonic autonomy and high-art transcendence are deeply embedded in systems of social difference—specifically race. I mean to challenge the notions of (western) art-world modes of distanced listening as neutral and reveal their articulation within systems of racial and other forms of difference. In other words, in their very posture of transcending difference, the sonic environments I am discussing recruit the sound of jazz into more covert systems of racialization. But before following up on these ideas later in this chapter, it is first important to understand more about the history of jazz in the concert hall.

2.4. Jazz in the Concert Hall: A Sounded History

JALC’s is certainly not the first attempt to elevate jazz as a western-style art by deploying the symbolic prestige of the concert hall. In this section, I stitch together a history of such efforts. Though by no means comprehensive, and admittedly biased toward the US and New York, the histories I discuss represent a stream of jazz history crucial to understanding the sound of Rose Theater with greater depth. Jazz’s long association with the concert hall is a spotty and often contradictory tale, one which is not conducive to coherent metanarratives—and I don’t try to construct any. Yet I do trace a few themes. Most important is a recurrent desire to mobilize the concert hall as a symbol of both prestige and distinction. That is, concert halls were often

used to elevate certain musical styles while distinguishing them from other sounds and styles—often coded as racially other—that were barred entry. I also attend to how this history has intersected sound, noise, and listening, but did not always follow the patterns one might assume.

2.4.1. Early Jazz and Swing

One of the most significant early attempts to use the concert hall's ability to shape both the sound of jazz and the listening practices used to appreciate it was Paul Whiteman's famous 1924 concert at New York's Aeolian Hall, "Experiment in Modern Music." The show framed the white bandleader's brand of "sweet" or "symphonic" jazz as the culmination of a musical (and racial) evolution from primitive noise to sophisticated art.¹⁰ Some hailed the concert, played by white musicians, as "dignifying and legitimizing jazz," often doing so by deploying racialized *sonic* metaphors. For example, observers noted that the concert hall provided "freedom from the animalistic" (Ogren 1989, 158) sounds associated with the "primitive," "discordant jazz" (Ernst [1924] 2015) they associated with Black musicians. The walls of the concert hall reinforced racist ideologies linking a range of unwanted sounds to racially marked bodies while mobilizing tropes of segregation and sanctuary to amplify the between "Black" and "white" sounds. Thus, Whiteman's concert was hailed as reaffirming the dignity of professional white musicians specifically by erecting a distinct contrast to what one 1920s observer described as "vulgar, noisy, blatant cacophony produced by Negroes at cabarets or vaudeville shows" (in Lopes 2002, 86). According to this thinking, the concert hall, as much for its sonic characteristics as its

¹⁰ Other white bandleaders espousing the "symphonic" approach to jazz, and who gained early access to concert halls, include Vincent Lopez, Paul Specht, and Ferdie Grofé (see Lopes 2002; Ogren 1989). 1924 saw jazz's admittance to a "League of Composers lecture recital" (Koenig 2002, 273–74). Earlier in the year, a "Popular Music Concert" presented by Eva Gauthier was known to have presented "ragtime" content, but I haven't found any scholarly study of it (see Koenig 2002). Also of interest are Will Marion Cook's concerts with his Southern Syncopated Orchestra with Sidney Bechet (see DeVeaux 1989).

symbolic associations, would bring decency, order, and civilization, while the disordered sounds in less formal spaces remained racially othered.

An even earlier landmark came in 1912, when James Reese Europe led an all-black 125-piece orchestra at Carnegie Hall for a “Concert of Negro Music.” Though considered by some to be part of jazz’s “prehistory” (e.g., Badger 1989), the concert was a milestone, and it was so well-received that Europe returned the next two years. These concerts included a range of styles, including marches, dances, ragtime, “syncopated music,” choral pieces, and many more. Alain Locke (1936) called it a “formal coming-out party,” in which “the musical elite of New York, the atmosphere and the comparison challenged that of any concert of ‘classical music’” (68).¹¹

On the whole, when jazz entered the concert hall in the first half of the twentieth century, there was little of the attentive, quiet listening associated with the classical concert hall. In these years, performances included a smattering of one-off “experiments” and educational theme nights (like Whiteman’s), as well as industry showcases, galas, jazz magazine “all-star” showcases (e.g., Met Opera House, 1944), and, most financially fruitfully, “jam sessions” featuring well-known musicians. While these events played on the social prestige of well-known concert halls, they rarely embraced the forms of classical listening ideals found in Rose Theater.

Benny Goodman’s famous debut at Carnegie Hall in 1938 is a case in point. Widely hailed as a landmark for jazz, this concert has probably received the most fanfare from jazz fans and critics as a “coming of age” for jazz (Gioia 2011, 142). But there is little evidence the concert hall setting made the music, or the audience’s reaction to it, radically different than when Goodman played in ballrooms and other dance venues. Indeed, contemporary journalism told of

¹¹ For more on Europe’s concerts, see Badger (1989); Walton et al. (1978). Also of note was a 1928 Carnegie Hall tribute to W. C. Handy.

“dancing in the aisles” (in Gioia 2011) and a boisterous audience that “clapped along with the music, cheered every solo, and gave Benny an ovation” (Charters and Kunstadt 1981, 270; see also Tackley 2012).¹² A related story is found in another landmark Carnegie Hall performance of the same year, this one with a more self-consciously “educational” mission. John Hammond’s “From Spirituals to Swing” concert was framed as a historical showcase of “America Negro Music” (Dugan and Hammond 1974).¹³ While the lofty Carnegie Hall surroundings were central to the concert’s symbolic “from margins to center” (Ramsey 2013, 42) narrative, Hammond had little interest in fostering a formal concert-listening environment. In the program notes, Hammond and his partner John Dugan prompted patrons to embrace an “atmosphere of informality and interest,” stating, “May we ask that you forget you are in Carnegie Hall?” (Dugan and Hammond 1974, 196). Indeed, by most accounts, these concerts were *loud*—and conspicuously participatory. One review stated: “A good time was had by all—except, perhaps, by the manager of the hall, who might have been wondering whether the walls would come tumbling down” (Taubman 1938).¹⁴

Vocal audiences and rollicking atmospheres were also pronounced features of the “jam session”-concerts that started flourishing in the 1940s. Well-known series like Eddie Condon’s popular jam sessions and Norman Granz’s long-running Jazz at the Philharmonic (JATP), as well

¹² I do not mean to imply that dancing and vocal interaction preclude serious listening. Indeed, there is a long history of jazz fans attending dance-oriented performances only to listen (see, e.g., DeVaux 1989, 9). Yet, it is important to draw a contrast between concerts like Goodman’s and the more sedate events more redolent of the traditional western notion of a “concert.”

¹³ Like many earlier concerts—including a portion of Goodman’s—the program progressed along an evolutionary progression of Black music history, starting with performances of “African Tribal Music” and culminating with “hot” swing (Dugan and Hammond 1974).

¹⁴ Other well-known examples from this period include a publicity event at the Imperial Theater featuring Artie Shaw among many others, but, because of their cost—which generally included hiring many bands to complete the lineup—jazz concerts were “isolated events” (DeVaux 1989) for much of the late 1930s until the mid-1940s.

as a number of “other carbon copies and mutations” (Gitler 1985, 4), were known for following a freewheeling format with thrown-together personnel and negligible rehearsal. This formula, Scott DeVeaux (1989) claims, “formed a special category with its own aesthetic criteria, sharply at odds with the notion of a formal concert” (20).¹⁵ Condon’s concerts were known to be loud, with long, high-energy “battles” between instrumentalists and drawn-out jams with little planning or focus (Kenney 1983). JATP, which in its very title transacted on western classical prestige, was criticized for its perceived lack of decorum, including “earsplitting whistles and cheers” from the “youthful and often unruly” audiences (DeVeaux 1997, 388; cf. Anderson 2007).

2.4.2. Ellington, Art, Bebop, and Beyond

A particular landmark, bucking many of the trends I’ve been describing, was Duke Ellington’s 1943 debut at Carnegie Hall. Ellington largely avoided the loose jam session format while embracing long-form compositional forms purposefully resonant with western classical traditions. At this concert, the first of many the composer, Ellington debuted his three-movement suite, *Black, Brown, and Beige* (see M. Tucker 1993; Schuller 1989). Its debut at Carnegie Hall would make it a landmark occasion by any measure, but it was an especially fitting triumph for a composer that had for years been one of the music’s great hopes for advancing an “art” conception of jazz (see Porter 2002). It was a milestone occasion, even if contemporary reviews were, at best, mixed.¹⁶

¹⁵ DeVeaux (1989, 1997) and Kenney (1983) both discuss how loosely organized jam sessions, requiring little rehearsal or musical programming, provided one of the only ways to consistently make a profit producing jazz concerts in large venues with no dancing.

¹⁶ This concert was the start of a yearly tradition for Ellington that lasted until 1951. Ellington continued playing Carnegie on a less regimented basis through 1972. In total, he played more than twenty concerts.

With the advent of bebop in the early and mid 1940s, the onus of innovation and assertions of artistic autonomy shifted to a new “after-hours renaissance” (Ramsey 2013, 26) associated more with nightclubs more than concert halls (Peretti 2007; DeVeaux 1997). Bebop musicians embraced some of the hallmarks of western aesthetic modernism, most notably a reframed relationship between performer and audience that posited a more serious and detached posture of intellectual and aesthetic appreciation. But despite this orientation, as DeVeaux (1989) states, “bebop never entirely became a music of the concert hall. The natural milieu for the bop combo was—and to a large extent remains—the more informal surroundings of the nightclub” (25).¹⁷

But by the 1950s and into the 1960s, in what Paul Lopes (2002) has called the “New Jazz Age,” it became increasingly common to find jazz in concert halls (Anderson 2007). Gabriel Solis (2014) touches on this fact in his study of Thelonious Monk’s posthumously released album recorded live with John Coltrane at Carnegie Hall in 1957. Solis notes that in this period, as today, jazz was widely considered “more appropriate to night clubs, taverns, and dance halls than the auditorium.” Yet Solis also marvels, based on an “informal perusal” of *New York Times* advertisements, at “just how common, if not commonplace, an evening of this sort had become by the late fifties” (39).¹⁸

¹⁷ Important moments include a Parker/Gillespie quintet performance at Carnegie Hall in 1947 and a celebrated all-star quintet performance at Toronto’s Massey Hall in 1953 (on the latter, see Laver 2009). DeVeaux (1989) claims that the practice of attentively listening to bebop in clubs was made possible by the rise of the (non-bop) jazz concert from 1935 to 1945, no matter how varied the attention actually was in those concerts (as he himself documents).

¹⁸ My own casual inspection of the Carnegie Hall concert history did not inspire me with full confidence in Solis’s qualitative judgment. I found at best a handful of jazz performances per year in the mid-to-late 1950s. They were in all cases produced by outside promoters (Norman Granz, Don Friedman, etc.) and were mostly thrown-together “all-star” lineups, theme nights, and benefit concerts. None were clearly sponsored by Carnegie Hall itself. And, as the Monk/Coltrane concert exemplifies, jazz artists were often only one part of a larger multi-ensemble program. (The headliner on that night was, in fact, Ray Charles). Nonetheless, it is certainly true that the relative increase in concert hall jazz performances indicated a wider set of changes in jazz’s place in art-world hierarchies.

It should come as no surprise that concert hall jazz had become a more common occurrence by the late 1950s, considering the robustness of a handful of postwar efforts to solidify jazz's high-art status. This includes cold-war efforts to portray jazz as America's contribution to world musical art, one teeming with symbolic resonances with utopian democratic principles that US actors hoped would detract international attention away from Jim Crow oppression (see Von Eschen 2004; Anderson 2007; Jankowsky 2016; Monson 2007). Perhaps even more important was a new critical establishment, including a generation of writers wishing to establish jazz's high-art credentials (Gennari 2006). Underlying all of these developments was a transitioning commercial marketplace increasingly unable to support jazz as a popular music, prompting many musicians to seek opportunities in art-world spheres (Anderson 2007; Lopes 2002).

In the 1950s, no single jazz artist or group better exemplified the intersection of musical style, respectability, and the sound of the concert hall more than the Modern Jazz Quartet (MJQ). The MJQ not only made a point out of affiliating with classical aesthetics but actively associating the sonic environment of the concert hall with a certain kind of prestige, respect, and their attendant financial and other benefits.¹⁹ Spurning what they deemed to be the distractingly noisy environment of the average jazz club, MJQ members, led by pianist John Lewis, found the classical concert hall to inspire the quiet, attentive listening environment they felt their music required—and they tailored their music for such an environment (Klotz 2016, 2018). Kelsey Klotz (2016) writes that John Lewis specifically fashioned the group's composition and

¹⁹ As Milt Jackson, the group's vibraphonist, stated, "The idea was to raise the stature of jazz, which had become...stigmatized just by the name itself and was put down. For me, jazz is on the same level as classical music, which everyone respects in all countries" (quoted in Monson 2007, 96).

performance style for “structural listening”—a concept with roots in Adorno and Schoenberg emphasizing a cerebral attentiveness to a performance’s overall structure and how intricate details contribute to a cohesive whole—in order to “facilitate the MJQ’s entry into the stereotypically white space of the concert hall” (31). Klotz (2018) writes: “By physically placing the quartet’s music within a concert hall setting, Lewis could more easily achieve a focus on listening, stripped of distraction and positioned within a space reserved for compositions of high musical and social value” (39). This is a critical point I will return to below.

The MJQ was certainly not the only group that had become dissatisfied with the acoustics and auditory cultures of jazz clubs (see Lopes 2002, 217–44). Other well-known examples include bassist/composer Charles Mingus, who was vocal about his preference for concert halls and was notorious for chastising talkative jazz club audiences, and Dave Brubeck, who found unprecedented success touring colleges and universities. There were many more. In the 1950s and 1960s waves of musician collectives and other jazz organizations arranged performances in concert halls and other art-world spaces (art galleries, lofts, etc.). And, on the more commercial and institutional ends of the spectrum, these years saw the flourishing of jazz festivals catering to upper-class whites, like the famous Newport series that began in 1954, as well as the rising acceptance of jazz in universities, both as a network of performance venues and source of new fans. Especially in the 1960s and beyond, improvising musicians (especially Black experimentalists with sometimes-ambivalent relationships with “jazz” as a genre) carved out an increasingly diverse network of alternative performances spaces that challenged the ideological centrality of both the nightclub and the concert hall (G. E. Lewis 2008, 325–88; 2004). Most famous of the new sites include the 1960s and 1970s “loft” spaces in musicians’ homes and art galleries, as well as other venues like coffee houses, cafes, bars, outdoor spaces, and alternative

festivals (Piekut 2009; Heller 2017; Currie 2012; Porter 2002, 191–239). Yet despite the variety of sites where these musics have been played, the concert hall has remained a privileged site of social prestige.

2.5. Conclusion

Though the history recounted above shows that jazz has long been performed in concert halls, what strikes me is how many of these events, even in the 1950s, would best be described as “special jazz concerts” (Lopes 2002). These were specifically produced events distinct from the venue’s regular, institutionally sanctioned programming—usually as part of all-star touring packages (like JATP), benefit concerts, or festivals. To a considerable extent, promoters, booking agents, and collective organizations *rented* the top halls, and the final responsibility for making the performances financially viable fell on these “outside” parties—a far cry from the more traditional art-world model of non-profit, corporate, and governmental patronage. Jazz had gotten into the room, but it wasn’t a true member of the club. And while I would argue that jazz is still not fully accepted in the art-world elite, JALC has made remarkable strides in this direction that represent a break from much of the history I described. This is in no small part a function of the organization’s material presence (the building itself) and its *sound*.

When jazz repertory orchestras first aligned with major cultural institutions, most notably in the early 1980s, organizers faced an array of financial and practical obstacles exacerbated by jazz’s historical exclusion from traditional art-world funding avenues. Similar obstacles faced the artist collective model adopted by many Black experimentalists, though such groups embraced certain aspects of the high-art political economy earlier and more effectively than the early jazz repertory movement. Indeed, years before organizations like Carnegie Hall (1991), the Smithsonian (1990), and Lincoln Center (1987) began dedicating resources and formal bookings

to jazz orchestras, Black experimentalists had already made significant inroads with major nonprofit granting organizations.

In 1987, when Lincoln Center first sponsored the “Classical Jazz Series,” which would later develop into JALC, it was a significant shift in jazz’s relationship to the concert hall. For example, the formation of JALC as a stable institution represented a consistent year-to-year investment of resources, as well as formal institutional sanction, both of which conveyed a new kind of legitimacy qualitatively different than the “outsider” concert productions more common historically. Even more critical was the eventual opening of JALC’s current facility, which not only provided permanence and stability but also allowed for unprecedented attention to the manipulation of sound, mustering a massive budget for technology, design, architecture, and professional labor. Through this extraordinary attention to sound, JALC and its physical spaces palpably alter how jazz is actually *done*, what it *is*, and where it might be said (and felt) to “belong.” (At least, that is, the styles of music JALC believes to be jazz.)

By asserting, through sound, a new place for jazz so dramatically cut off from the exterior physical world, acoustics are mobilized in a wider field of negotiations over space and race. One critical way this is done is the denial, through an isolated, quiet sonic environment, of the “limiting fantasy” of the jazz club as the ultimate site of authentic jazz performance (Marsalis in Jacobson 2001). On this point, Marsalis and JALC might find an uneasy ally from an unlikely source. George Lewis, within a discussion of the 1970s Black experimental music scene, takes similar issue with how, “for jazz-identified black musicians..., the club...had been heavily ideologized as the ideal, even the genetically best suited space for their music” (2008, 349). For Lewis and other experimentalists, jazz clubs, in addition to being creatively inhibiting and difficult to book, “began to appear as a kind of unwanted surveillance of the black creative body”

(350). Lewis's evocation of the jazz club as a "genetically" mediated site of Black corporeal performance powerfully evokes race, racism and their mediation by sound and space. Jazz clubs, in this view, come to constrain Black musicians both aesthetically and materially, imposing limiting, racially coded aesthetic frameworks that musicians are pressured to engage with while controlling one of the primary avenues for making a living (Heller 2017; Piekut 2009).

To resist such racial ideologies by producing, finding, and dwelling in alternative spaces is a challenge to the racial stratification of space. Geographer Katherine McKittrick (2006) uses the concept of "black geographies" to explore how the power-infused construction of space and place articulates racial and other difference (gender is also key). She states: "The 'where' of black geographies and black subjectivity...is often aligned with spatial processes that apparently fall back on seemingly predetermined stabilities, such as boundaries, color-lines, 'proper' places, fixed and settled infrastructures and streets, oceanic containers" (xi). McKittrick is talking about how repetitively reproduced and naturalized "commonsensical narratives" (xv) naturalize patterns of human spatial practice into durable and constraining codes of social difference. Here, "the placement of subaltern bodies deceptively hardens spatial binaries, in turn suggesting that some bodies belong, some bodies do not belong, and some bodies are out of place" (xv).

For JALC, then, the use of sound isolation to stake out a sequestered space for a disembodied jazz-as-object is a consequential rebuke to the idea of jazz's "genetically" ideal space of belonging (G. E. Lewis 2008, 349). Acoustics are thus recruited into Marsalis's mission to resist limiting notions of where "jazz belongs" (pers. comm., April 13, 2019). Building on McKittrick and other geographers of race (Gilmore 2002; Kobayashi and Peake 1994; Peake and Schein 2000), the isolated sound of Rose Theater asserts and affectively naturalizes a new "proper place" for the jazz played within its walls, consequently altering the spatial arrangement

of race and racism. To challenge the symbolic and material primacy of the jazz club is to disrupt the racial geographies that assign jazz, and the bodies associated with it, to certain “genetically best suited” places (G. E. Lewis 2008, 349). To so thoroughly separate outside sounds from the space of performance, thus creating a strikingly quiet “blank canvas” (C. Darland, pers. comm., March 20, 2019), underscores how thoroughly the jazz inside has been separated from outside associations with social noise and stereotyped sites of belonging.

But I must stress how Rose Theater’s sound does more than challenge stereotypes about jazz’s proper place; it also positively asserts a *different* place of belonging. And this is where JALC’s project runs into more problematic territory. For, unlike the Black experimentalists who opted for a wide diversity of alternative performance sites to challenge the art world’s racial geography, Marsalis and his cohort have placed disproportionate focus on one rather old—and rather problematic—sonic ideal: the European classical listening experience.

The detached aesthetic discussed in this chapter, so dramatically materialized in steel and silence, is aligned with a range of naturalized assumptions articulated within ethnocentric classical music ideology. While a central aspect of this ideology is the “universal” nature of art as abstracted from human social relations, it is in fact reflective of a logic of whiteness that is anything but universal. Indeed, as I discussed earlier concerning the MJQ, JALC’s associations with studious, polite listening ontologizes jazz as a musical object contingent upon western ideas about art, autonomy, and the rituals that go along with them. Like the MJQ example, JALC sonically articulates jazz with material and discursive traditions at the heart of European art worlds and thus at the center of aesthetic regimes of whiteness.

In an oft-cited 1996 article, George Lewis (2002) critiques how the Eurological concept of “experimental music” disavows the foundational influences of jazz and other Afrological

improvised musics, noting how “coded qualifiers to the word ‘music,’” such as “art,” “concert,” and “serious,” are used “to delineate a racialized location of this tradition within the space of whiteness” (217). To Lewis, like many others (e.g., Kajikawa 2019; Ewell 2020), the art-music world poses as an objective field governed by universal aesthetic standards, but it remains trapped in its own partiality, unable to see beyond its provincial Eurocentric horizons. An invisible and unspoken whiteness pervades this world, allowing white composers, journalists, musicians, and other cultural gatekeepers to feign impartiality while recognizing Afrological and other musics only to the extent they can be evaluated by western criteria (cf. Jones 1967b). Under the cover of “exnomination,” a discursive move by which whiteness is made to lurk unnamed and unrecognized (Fiske 2016; cf. Dyer 2017), the hegemonic machinery of racial difference elevates white contributions while “other” musics—especially those associated with and played by Black musicians—are consigned, explicitly or not, to the periphery.

Of course, JALC’s project powerfully opposes many aspects of the marginalization of Black culture. As Eric Porter (2002) puts it, at its core JALC presents “a vision that affirms the humanity of black people...[and] places them at the center of American experience” (288). Marsalis and his intellectual cohort talk about this idea a lot, often quite elegantly (e.g., Murray 1976; Marsalis 1986). And at every turn in my fieldwork, I have found ample confirmation of the sincerity with which they believe in and pursue these ideals (e.g., J. Uhl, pers. comm., January 20, 2019; R. Gibson, pers. comm., May 6, 2019; S. Berkow, pers. comm., February 26, 2019). Taking this into account, it might make sense for me to pay less attention to the largely unnoticed whiteness underlining certain sonic practices and focus more on JALC’s recruitment of the built environment to place jazz, which JALC asserts as *both* a non-denominational “American” music

and a privileged mode of Black expression, at the center of US culture.²⁰ At a basic level, I endorse this reading, which reveals a rare intersection of music, sound, race, and geography at the heart of a musical project that has strongly influenced the cultural geography of New York and beyond. Despite many formal and institutional parallels with the western art world, as well as a rather circumscribed and conservative vision of Blackness, JALC has consistently carried a message of Black cultural leadership that has been on the right side of pivotal ideological conflicts over racist ideas of Black cultural inferiority and what Albert Murray (1970) calls “the fakelore of black pathology.”

JALC’s social perspectives are paired with a blues-heavy musical vision deeply invested in African American aesthetics.²¹ Most conspicuous are swing and the blues, but also emphasized are a range of vocal instrumental effects and participatory modes of performance and reception (see Floyd 1995; Wilson 1992; T. Jackson 2012; Murray 1976). Indeed, we find widespread use of a range of stylistic traits considered in some contexts as “noisy” non-music but artistically desirable in certain systems in Afro-diasporic aesthetics. Among others, this includes what Samuel Floyd (1995) calls “the foundational elements of African-American music: calls, cries, and hollers; call-and-response devices...blue notes, bent notes, and elisions; hums, moans, grunts, vocables, interjections and punctuations” (6)—and a lot more. All of these Black aesthetic practices are sincerely promoted at JALC, even if the acoustical phenomena I describe here add significant complications (see also Wetmore, forthcoming).

²⁰ Marsalis long ago called jazz “the nobility of the race put into sound” (Marsalis 1986). Though he and JALC have changed their perspectives on a number of issues in the ensuing years, the assertion of a crucial relationship between jazz and “Afro-American” life has not seemed to wane very much (see, e.g., fieldnotes May 9, 2019).

²¹ In fact, JALC has been famously criticized, largely by white musicians and critics, for a perceived bias *against* whiteness, a reactionary argument that has been widely critiqued (e.g., T. Jackson 2012).

Though I agree with Ingrid Monson (2007) and others about “the limits of any rigidly fixed definitions of black and white aesthetics” (77), I also agree that such distinctions carry continued salience. At JALC, we thus find a unique environment in which a range of sonic hallmarks of Black musical aesthetics intersect and overlap with a “pure,” “clean,” and quiet acoustic environment with a long ideological history as a mediator of white cultural values. I don’t wish to imply that such sonic characteristics are all-pervasive, or that they undermine JALC’s vision of African American dignity and style. But I do call for deeper awareness of how such manipulations of sound serve as a prism of whiteness that conditions everything that goes on within the material box that is Rose Theater—even if each performance is a vastly complicated overdetermination of aesthetic and political factors.

In the following two chapters, I will extend this discussion with related themes that move out of the realm of western musical culture and into the realms of science and technology. That is, I analyze how overlapping values and complications are found in two more technological regimes: electroacoustic sound reinforcement and sound system design. Combined with this chapter’s analysis, I will use these materials to advance an argument about how the sonic environments at JALC—and elsewhere—reveal a complex assemblage of racially and gender-coded sonic values.

Chapter 3: “Make Yourselves Invisible”: Transparency, Fidelity, and the Illusion of Natural Sound

3.1. Introduction

This chapter continues the previous chapter’s interrogation of JALC’s “pure and clean” sound ideal, this time through an investigation into sound reinforcement—or amplification—at Rose Theater. I specifically focus on the concepts of fidelity and transparency, and how they guide JALC’s attempts to conjure a “natural,” “acoustic” sound. The goal is to provide listeners with the convincing experience of technology-free sound while enhancing certain musically salient details that could not be heard in a truly acoustic environment. Such a project paradoxically requires a great deal of technological manipulation. On this point, this chapter introduces Meyer Sound Labs, the provider of JALC sound systems and a community of technicians that promote a distinct approach to “accurate” sound reproduction technology couched in the epistemology of western science. I ultimately show how Meyer’s exceptionally transparent sound systems interact with Rose Theater’s physical acoustics and technicians’ distinctive practices to challenge some of the most cherished assumptions about sound mediation itself. Namely, rather than conceiving of fidelity as the faithful and transparent reproduction of preexisting original sounds, I demonstrate how, at Rose, the relation of fidelity emerges in an interactive commingling of mechanical waves, amplified sound, human and nonhuman bodies, and shared expectations and memories. The result is a plausible impression of technology-free space that sounds clearer and more intelligible than any truly acoustic space ever could. I will build on these findings in chapter four to draw new connections between jazz and (1) western classical ideals of natural space and (2) scientific ideals of abstraction, rationality, and control.

3.2. “Make Yourselves Invisible”: Interrogating Fidelity, Transparency, and “Original” Sound

“Make yourselves invisible.” This is how Doug Hosney instructs the sound engineers working at JALC. Hosney is Vice President of JALC in charge of all operations of the performance facilities. He told me this as we walked through a mostly empty Rose Theater. “I don’t want you to comment on [the sound]. I don’t want you to editorialize it. I want it to be as clear as possible.” For the influence of technology to be detected is to infringe upon an ethics and aesthetics of mediation that privileges “natural” sound—or, what Hosney repeatedly called “pure and clean” sound—above all else. Technological gear and its effects, while essential to nearly every type of performance that crosses the Rose Theater stage, must be a silent collaborator with the acoustic sound of instruments and voices, a sound which, in this room, serves as an elemental source of vital authenticity.¹

By instructing engineers to conceal their work, and the effects of technological apparatuses, Hosney evokes longstanding tropes of *transparency*: the widely held belief that sound technology and its human operators should recede into the background. Whitney Slaten (2018), commenting on years of autoethnography as a live sound engineer, foregrounds transparency not only as a technological and aesthetic ideal but also as a sweeping trope intersecting theories of labor and feelings of personhood. Slaten shows how professional norms dictate that engineers develop a “cultivated ‘hiddenness’” (2) in which the processes and

¹ This anti-amplification, almost anti-*electricity* aesthetic was once emphasized to me during the set-up for a JLCO concert featuring special guest organist Joey DeFrancesco. While for most concerts the JLCO is billed as “The Jazz at Lincoln Center Orchestra with Wynton Marsalis,” this one did not include the “with Wynton Marsalis.” While pushing DeFrancesco’s organ into its proper place on the stage, a stagehand told me that Marsalis “refused” to perform on this particular bill specifically because he was “against electric instruments” like the organ (field notes May 17, 2019). I am purposefully withholding the stagehand’s name here.

technologies of mediation, as well as the social presence of the engineer as a person, must remain concealed. Sound engineers and their gear must remain exterior to awareness in order to sustain the conceit of artistic creativity as the exclusive domain of western music's celebrated heroes: musicians, composers, and the musical works they create and perform. With technologies and their operators safely hidden away, a "live" performance retains a magical aura that distinguishes itself from the staler, less authentic "mediations"—recordings, broadcasts, and any other kind of "copy" deemed more ontologically distanced from the "real thing."²

At JALC, this "absent presence" (Slaten 2018, 2) is crucial to cultivating ideals of aural purity, cleanness, and naturalness. "In an ideal world," Hosney told me, "the connection between somebody sitting [in the house] and a musician playing on stage is this uninterrupted flow. It's a kind of communication. So, anything that you can do to get the obstacles out of the way and to make that *as pure and clean as possible*, is the highest level of the work." Though technology may aid the connection, or the "flow," it may also be an "obstacle" if perceptible. It must be tucked away in favor of purity and cleanness.

This requires the right technological systems and methods of operating them. Hosney explained this to me while recounting the 2015 installation of a new sound system from Meyer Sound Laboratories³:

² Similar anxieties over mediation's negative influence are found throughout the history of sound reproduction technologies such as recording, radio, and telephony (see Sterne 2003), all of which have coevolved with value systems that distinguish unmediated "live" sound as the privileged site of authenticity from mediated sounds that indicate a "loss of being" (Lastra 2000; Sterne 2003; cf. Benjamin 2007).

³ During most of the design process leading up to the 2004 opening of FPRH, the sound systems were supposed to be Meyer. The whole Sound of Jazz team agreed that they would be most appropriate for the kind of sound they were looking for. Tom Clark, who I interviewed for this project, designed a Meyer system. It would ultimately go unused, however, because Sidney Harman, who knew Wynton Marsalis personally, offered to provide free JBL systems (as well as a full complement of microphones, some of them very expensive and many still in use today).

I wanted the ability to add *amplification to an acoustic sound*. In other words, if I had a band on stage and I wanted them essentially acoustic, but I wanted to lift the piano and the bass and play with the blend a little bit, I wanted to do that as *transparently* as possible. I didn't want it to sound like the piano was amplified—but that it was acoustic. So, it required a speaker that as it comes up through the power isn't changing the sonority or the tonal quality of the instrument that it's amplifying. So, that's great microphones and great speakers. I didn't want it to sound amplified. And if I was amplifying it, I wanted it to *sound* acoustic. I wanted it to sound as natural as possible. (Hosney, pers. comm., December 19, 2016)

To be “essentially acoustic” is to embrace a perceptual ideal of a “natural,” amplification-free sonic experience that conceals the very technology that facilitates it. The amplified sound from the speakers must blend artfully with the acoustic sound, but it must also be undetectable. It must not change the “tonal quality” of the original sound. JALC's coveted “natural” and “acoustic” ideal, then, emerges in the imperceptibility of human interventions and the phantom non-presence of the machines themselves.

As I describe below, such a natural acoustic ideal requires far more than high-tech gadgets—although JALC certainly has them. The sound systems at JALC, and the methods of their operation, are at the far extreme of the “scientific” end of the spectrum. The systems are designed, installed, “tuned” (see chapter four), and financially sponsored by Meyer Sound Labs, an elite provider that assertively touts a scientific approach to researching sound and developing products. Meyer Sound is more than just a business entity famous for designing high-end audio technology, but also a community of technicians with a distinct approach to conceptualizing and assembling them. Such systems, the envy of many, exhibit the exceptional care that Meyer extends to implementing concepts of mediative accuracy in ways that ground intuitive concepts

This decision was panned by everyone who discussed it with me (D. Gibson, pers. comm., April 4, 2019; J. Uhl, pers. comm., January 19, 2019; B. McCarthy, pers. comm., December 13, 2018; T. Clark, pers. comm., March 26, 2019). And they were very willing to discuss it. The current Meyer systems were installed upon the conclusion of the 10-year sponsorship agreement with Harman (T. Clark, pers. comm., March 26, 2019; B. McCarthy, pers. comm., December 13, 2018).

like transparency and fidelity in the putative epistemological authority of western science. Curiously, especially considering how central the idea of fidelity has been in the history of sound reproduction (see E. A. Thompson 1995), only rarely have manufacturers taken the idea of accuracy as their primary object of scientific scrutiny. This is especially true in the world of *live* sound technology, where Meyer has been an undisputed leading force in using scientific methods to create “neutral systems” whereby sound “passes through without tonal modification” (McCarthy 2016, 192).

In this chapter, I consider these technologies as parts of a wider assemblage of materials and methods that reveal the “natural,” “acoustic” sound to be anything but technology-free. I show not only JALC’s overlapping commitments to “natural” sound and to scientific approaches to “neutral” mediation, but also a new way to think about fidelity as an interactive commingling of music, technology, bodies, and place. This reframed model of fidelity presents a profound challenge to one of most hallowed concepts in theories of mediation: the distinction between a preexisting “original” and its mediated “copy.”

Simply making sense of these technologies is a hefty task, so I will leave the analysis of their broader implications for jazz and society for chapters four and five. In those chapters, I will build on the findings in the current chapter to explore broader arguments about how sound and sound technology fit in with JALC’s distinctive modes of engaging with Western modernity, and how such engagements relate to problematic issues of race, gender, and coloniality. Specifically, I will use this chapter’s findings to explore JALC’s epistemological alignments with (1) western classical ideals of purity and naturalness, and (2) abstractions of sound as quantifiable—and thus *controllable*—object of aesthetic and scientific scrutiny. As I discussed in the introduction of this dissertation, both of these themes resonate with universalistic pretenses of western modernity

that I will ultimately interrogate for their implications for race and difference. These streams of argumentation will take some time to develop. For now, this chapter's task is to closely attend to the practical workings and philosophical commitments entailed in Rose Theater's distinctive approach to electroacoustic reinforcement.

I begin by introducing recent scholarly work on fidelity and transparency that troubles the idea of sound reproduction as the conceptually simple process of copying, to varying levels of success, preexisting "original" sounds "in the world." I then introduce Meyer Sound and two of my key interlocutors from the company—Bob McCarthy and John Meyer—explaining their distinctive investments in measurable accuracy and scientific design principles. I follow this by interrogating what goes in Rose Theater, offering an ontology of sound reinforcement as a mix of electroacoustic amplification, acoustic reflections, and subtle mixing, one that endeavors to present a perceptually "natural" experience that is magically clearer, more intelligible, and more balanced than could ever be achieved in a truly "acoustic" space.

3.2.1. "To Capture the World": Fidelity and the Dream of Natural Sound

When Doug Hosney discusses ideals of imperceptible amplification and "natural," acoustic sound, his words draw us toward a discussion of *fidelity*, a wide-ranging concept that combines notions of imperceptible mediation, correspondence between "original" sounds and their mediated "copies," and various modes of faith in technology's ability to maintain, without corruption, the aura of an original sound in its natural settings—what Walter Benjamin (2007) calls "its unique existence at the place where it happens to be" (221). There is considerable overlap between fidelity and other key terms in this chapter, such as transparency and accuracy. Indeed, they are often used, including by experts, as synonyms.

It is useful, then, to outline a few imperfect shades of terminological difference to orient the following discussion. In audio circles, words like fidelity, transparency, and accuracy all imply some sense of *correspondence* between two poles of a relation of mediation, with some technological apparatus or network of apparatuses in between them. The broadest and most multivalent concept is fidelity, which often leans toward questions of rendering authentic meditations of sonic “reality,” musical or otherwise. Though transparency can mean the same thing, it often places more attention on the technological system, emphasizing that such devices, their operators, and their effects should recede from perception—or that a signal should pass through them without detectable change. Accuracy, for our purposes, is the closest to a technical or scientific idea of correspondence between two discrete and definable sonic entities, often oriented around the idea of measurability (or at least a *belief* in measurability as a modality for making truth-claims, even if the actual instruments to make some measurements don’t, or don’t yet, exist). Fidelity is often used to mean precisely the same thing, though I will generally refrain from doing so.

Fidelity is both the most romanticized and most elusive. On the surface, the enticing promise that technology may convincingly replicate a real sonic event “in the world” seems straightforward and reasonably attainable. Yet despite its intuitive appeal, the concept dwells less in any coherent, observable reality than what Jonathan Sterne (2003) calls a “world of magic” (284)—a socially constructed web of assumptions he dubs the “discourse of fidelity.” This hegemonic narrative posits sound technologies as disinterested intermediaries that capture and reproduce faithful representations of preexisting “original” sounds. Here, to transduce an original set of mechanical vibrations into digital or analog audio signals and then transduce them back into the world of vibrating air is to (re)present an authentic sonic reality.

But Sterne rejects the notion of an unproblematic sonic “reality that exists outside and prior to reproduction” (284). The function of sonic technologies is not, as the discourse of fidelity would have us believe, “to capture the world and reproduce it ‘as it really is’” (218)—for there is no “pure” sound waiting politely for microphones to collect it. Instead, the “original” sound is just as much a creation of the process of mediation—and the philosophy of reproduction—as the mediated copies: “the original is itself an artifact of the process of reproduction. Without the technology of reproduction, the copies do not exist, but, then, neither would the originals” (219).

Sound reproduction is a social process, Sterne tells us, one in which human participants are intimately entangled with the sounds they listen to and the network of technologies, practices, and ideologies that connect them. To capture a sound into a technological system—and to properly listen to it (itself no straightforward matter)—has always entailed contingent decisions and practices concerning how to operate the machines, how to relate to them, and how to interpret, consciously or not, the final product reaching the ears. Recordists, performers, consumers, and operators must develop specialized skills in listening and sounding so that believable mediations can be tailored to the idiosyncrasies of the devices they engage with. One learns to position one’s mouth in a particular way, speak or sing with a particular tone and volume, and, in the case of recorded speech, enunciate one’s words in a particular manner—all so that a properly conditioned listener might perceive the reproduced sound as natural and authentic.

Listeners, too, must do their part. In discussing a number of early sound reproduction technologies, Sterne proposes the idea of “audile techniques,” culturally particular listening skills that, among other things, enabled auditors to distinguish the desired sonic content—what they

wanted to hear—from the otherwise corrupting distortions added by the sound machines. It is in this *desire* on the part of the listener for technology to accurately present reality, and the trust that scientific progress might someday make good on this promise, that Sterne locates a powerful kind of *faith* that sustains the discourse of fidelity.

The mediation of sound presents countless other mechanical and affective difficulties, requiring human performers, technicians, and listeners to make manifold behavioral and even philosophical adjustments. All of which is to say that to capture a sound, no matter how “natural” it is meant to be, is and always has been a creative social act. There can be no disinterested, neutral copies of reality, for no one sonic reality can exist prior to and distinct from the conditions of its mediation. Or even the *potential* of its mediation. An act as simple as positioning a microphone in a certain place, or even *contemplating* where to put it (this is where philosophical investments come in), is to conjure and thus call into existence an original sound to be “copied.”

Live sound engineers know this better than most. Whitney Slaten (2018) specifically contests the prevailing belief that unmediated “liveness” embodies the supreme locus of pure musical being—with mediation nothing more than a mechanistic background process. This misconception, to Slaten, “deprecates the work of engineers by locating technological mediation as an adjunct to, rather than a constitutive element of ‘living’ music. These meanings that the word ‘live’ evokes undermine the highly technical, socially collaborative and creatively artistic contributions of live sound engineers in the production of contemporary music” (49–50). Much like Sterne’s challenge to the original/copy distinction in sound reproduction, Slaten highlights how the reinforcement of live music entails complex networks of transducers, electrical circuits,

social and technological practices, and conceptual and affective investments (see also Sandstrom 2000).

Much of Slaten's discussion relies on a binary metaphor drawn specifically from Sterne's model of fidelity in sound reproduction, proposing live sound amplification as "the relationship between an amplified 'copy' and an 'original' sound performed on stage" (2018, 48–49). The kind of fidelity desired in this model aims at enabling the listener to hear, in the sound coming *from the loudspeakers*, the same "acoustic image" as produced on the stage (48). As Slaten describes in detail, such an endeavor involves a range of technological manipulations intersecting a network of apparatuses, social relations, and cultural values. And, like Sterne, Slaten shows how the "original," in this case tied up with the idea of "liveness," does not in fact preexist the relations of mediation but instead emerges from those relations, and the "shop floor" labor of the operator. Slaten's intricate and vibrant narrative, like Sterne's, presents mediation as binary and sequential, positing a journey from original (however "constructed" it may be) to copy in which sound flows first from the stage to the engineer's console, and then to the speakers and finally the audience. With the engineer and their console at the material and conceptual middle point between musicians and audiences, and originals and copies, Slaten provides an intuitive locus to uncover and analyze the engineer's multiplex contributions and interactions.

3.3. "A Blank Canvas": Transparency and Meyer Sound

Later in this chapter, I will propose an alternative way of thinking about sound reinforcement that commingles with the fundamentally binary model offered by Slaten and Sterne. While I will affirm the socially and technologically constructed nature of the relationship of fidelity, I also complicate the basic "signal flow" narrative that describes sounds as moving in one direction from acoustic original to mediated signal to reproduced copy. But in order to get to

that discussion, and to understand JALC's distinctive approach, it is important to first spend some time contemplating the sound system itself. Also called the PA system, the PA, or just "the system," the sound systems in all of JALC's rooms consist of a network of black boxes (loudspeakers) wired together with copper cables, digital fiber, digital/audio conversion, and massively powerful digital processors. Only after better understanding how these technologies work can we fully appreciate how they interact and overlap with acoustic vibrations, human sonic ideals, and a new way of understanding the relation of sonic fidelity.

The sound systems at JALC are designed, manufactured, and optimized (or "tuned") by Meyer Sound Laboratories and their community of highly trained technicians. The company, based in Berkeley, California, is acclaimed for their high-end sound systems, audio analysis instruments, and methodologies for implementing them. Meyer has been an industry leader in developing a "scientific approach" to designing, measuring, and calibrating sound systems ("Philosophy"). This section introduces some of the fundamental technical and philosophical ideas orienting the Meyer approach to sound reinforcement, and it introduces some of the most important people in the company's history and its relationship with JALC. Throughout, I highlight Meyer's rare commitment to "objective" and measurable concepts of accuracy, transparency, and linearity, and the company's pointed embrace of science as a source of epistemological authority and methodological rigor.

To put it too simply, while most ideologies of sonic fidelity and transparency can be mostly reducible to aesthetic values and subjective ideals, Meyer is distinctive in its use of scientific concepts to approach such questions in a distinctively "technical" way. Indeed, they are an exceedingly rare exception to the dominant historical trends in sound technology, which have consistently mobilized the *rhetoric* of high-fidelity mediation while rarely attempting to

materially produce such a thing in any objectively demonstrable way (which is to say supportable by western positivist epistemology). In contrast, the “Meyer Sound philosophy,” as the company puts it, is perhaps the clearest and most scientifically rigorous foil to the “world of magic” Sterne associates with the knottier, more socially overdetermined, discourse of fidelity.

One of my principal aims in this section is to emphasize JALC as a rare intersection of some of the biggest names and firms in the world of high-end live sound, and to begin a conversation about how such associations constitute a recruitment of western science into JALC’s cultural and political projects. While I save the bulk of the technical discussion for chapter four, here I introduce some of the most important leaders of Meyer’s philosophy and methodologies, who were pivotal in setting up JALC’s rooms. They were also open to letting me join them in their work.

3.3.1. “The Master”: Bob McCarthy

The three main PA systems at JALC were designed and tuned by Bob McCarthy, the foremost maestro of sound systems design and calibration. His current position within the company is Director of Optimization. In the early 1980s, working tightly with John Meyer, Meyer Sound’s cofounder, McCarthy developed the principal theoretical concepts and the general methodological contours of what is now a widely accepted framework for quantitatively designing and analyzing sound reinforcement for live performance. (I analyze the technical details in chapter four.⁴)

⁴ McCarthy is currently Meyer Sound’s Director of System Optimization.

Mauricio Ramirez, a well-known figure in the PA community,⁵ told me how he and other techs have dubbed McCarthy “Bobby Mac-Kenobi,” a play on the fabled *Star Wars* character Obi-Wan Kenobi. Conjuring McCarthy as a Jedi master seems a fitting tribute for someone who more than anyone has created and propagated what has become a fairly standardized set of methods for designing systems and using high-tech measurement devices to tweak and tune.⁶ Unlike a Jedi, though, McCarthy’s claims to authority derive not from a mystical “force” that only a select elite are chosen to control, but from a scientifically explicable methodology demonstrable to anyone with the patience and math skills to get through McCarthy’s 600-page opus, *Sound Systems Design and Optimization* (2016). Frequently described as “the green bible” for its distinctive cover (e.g., M. Ramirez, pers. comm., January 19, 2019; J. Gaudin, pers. comm., July 3, 2018), the book is the authoritative text on setting up and tuning sound systems to objective scientific standards.⁷ One recent book says, “Bob McCarthy’s book is the bible on [sound systems]. Seek it, learn it, build statues of Bob in your theaters (only kidding about one of those)” (Loar 2019, 357). Though written with engaging prose—and often funny, in a nerdy

⁵ At the time of my fieldwork, Ramirez’s official title at Meyer Sound was Senior Technical Seminar Instructor, which meant he traveled the world teaching seminars on sound system design and optimization—much like Bob McCarthy. Also, like McCarthy, Ramirez is one of the company’s top sound system designers and optimization technicians. Ramirez plays a significant role in chapter 4.

⁶ The only more prestigious title might be a comparison to the even more legendary Jedi master Yoda. But that just doesn’t rhyme. Or perhaps that moniker might be more aptly applied to John Meyer, who is even more mysterious than McCarthy—and, incidentally, bizarrely cryptic in the way he speaks, lending even more credence to the Yoda comparison.

⁷ Here’s what Josh Loar (2019) writes about McCarthy’s (2016) book: “The master. Bob McCarthy has tuned more sound systems (and more COMPLEX sound systems) around the world than anyone else. As you expand your systems from basic to complex, as you work extensively with arrayed speakers, this book is the best resource for understanding how sound interacts in a space, and how we as system designers can manipulate it for the most clarity and control. I return to this book over and over again when I am designing projects.... Any system designer needs this on their shelf” (575). As a sign of how influential McCarthy’s formulations of these methods has become, Loar concedes that his chapters on sound system optimization are simplified reproductions of McCarthy’s. The highly regarded user’s manual for Smaart, the popular software FFT analyzer that competes with Meyer’s own analyzer, also copies essentially copies the McCarthy/Meyer procedure (Rational Acoustics 2018).

white male kind of way—the book’s heavy mathematics place aching demands on the reader, and more than a handful of technicians told me they’d been trying for *years* to get through it.⁸

There’s simply no other way to say it: McCarthy is the towering figure in this world. He is the one you want to write the forward to your book about live sound (e.g., Lively 2013a). Or to present the keynote to an audio engineering conference.⁹ Or to interview for a podcast (e.g., Lively 2013b).¹⁰ Or to call when a speaker blows out—even one from a rival company—and you need to redesign the system for a production the same night, with new loudspeaker choices, geometric arrangements, processor settings, filters, and so forth. I once observed precisely this, though McCarthy had to fulfill the role through a cellphone, doing calculations on a laptop in an airplane flight to who knows where. Referring to such occasions, McCarthy likens himself to “the Fixer” trope in film: “This is the kind of job that people would call me in to do. It’s like, ‘Well, you know, nobody else will sort it out. Call in the Fixer.’ It’s like Harvey Keitel from *Pulp Fiction*—the Cleaner. I’m the cleaner; that’s me” (quoted in Loar 2019, 269).

I was once hanging out with a handful of stagehands around the Front of House mix position in Rose Theater, when one of them, Mark Fiore, described the sound system like this. “All you have to do is just walk into this room and you say, ‘Ah, this system was tuned by Bob McCarthy’.” Another stagehand, whose name I didn’t record, had been telling a story about how a visiting mix engineer had claimed they could hear an imperfection in the system—that the coverage was uneven or that it was adding unwanted coloration. To those who embrace the

⁸ Among the many technicians who have expressed such sentiments are Alan Sheehy, Wayne Roelle, Alex (last name unknown, monitor engineer at Montreux Jazz Festival), and Johnny (last name unknown).

⁹ As a limited sampling, Bob McCarthy has given major addresses at the annual meetings of the Audio Engineering Society in 2014, 2018, and 2019.

¹⁰ See, e.g., McCarthy’s fascinating interviews on Nathan Lively’s “Sound Design Live” (Lively 2013b; 2015).

measurable approach to sound system calibration, the response to such claims is pretty uniform. “We just shake our heads,” Jose Gaudin, one well-respected system designer, told me (pers. comm., July 8, 2017). In this informal conversation, the mere invocation of McCarthy’s name invokes unmatched craft and precision, enough to settle most any argument. A given listener might challenge whether the system sounds “good,” but you can trust that the system is “neutral.” And that the sound is evenly distributed throughout the room.

The McCarthy legend also lives in other backstage musings among in-the-know technicians. In the course of my months and years hanging out backstage, I heard numerous incarnations of a recurring type of encounter narrative, which usually began something like this: “I once saw Bob McCarthy tune a room in [city A] and he told me [B].” The speaker would then describe something either fascinating, perplexing, or funny, often an esoteric piece of knowledge about audio. This would often prompt another stagehand into something like, “Well, when I saw him tune a room in [city C], he told me [D].” Then there’d be a period of comparing notes, trying to make sense of whatever McCarthy had said, or expressing wonder, bafflement, or general amusement (McCarthy has a distinctive and rapid-fire sense of humor). Conversations like this are common ways to informally pass around technical knowledge and casually claim the social capital that goes along with such encounters. On one occasion, one of these conversations ended up on the topic of McCarthy’s book. Two stagehands, Alan Sheehy and a per diem technician I knew only as Johnny, told the familiar personal account about trying to get through it, temporarily giving up, and promising to get back to it someday. I was also trying to get through it at the time, and I mentioned that I’d found some summary notes on the book from an acoustics professor who’d based a graduate course on it. Both stagehands’ eyes lit up and neither forgot to

give me their email and remind me before the end of the night to send the files. This knowledge was precious.

So common are Bob McCarthy stories that they form a kind of recurring trope of backstage life.¹¹ Hang around long enough, and it will happen. (That is, if you're hanging out at big-budget venues that compete on the top levels of audio equipment.) So widespread are these stories that when I once presented some of my findings at an annual meeting of the Society for Ethnomusicology, another ethnographer, who was working with audio technicians in Canada, approached me after my presentation to share stories about his own encounters with McCarthy. And, right there in the conference room, we had our own "meta" conversation *about* the conversations we had with our respective interlocutors about *their* encounters with McCarthy.

Even competitors recognize McCarthy's profound influence. Jamie Anderson, a former Meyer employee and current CEO of Rational Acoustics, Meyer's most direct rival in the live sound measurement business, put it like this:

I think the funniest thing is, one of the number one complaints when you hire Bob McCarthy—who is the master—"We hired him because he's the master." And then he gets done and somebody's like, "But it doesn't sound good!" That's not the point. What he was here to do is to make it all sound the same. You still have a lot of decisions to make about what is good, he's giving you a linear system. He's giving you a blank canvas to work on. (Anderson, quoted in Soar 2019, 371)¹²

¹¹ Without even consulting my field notes, I can recall the following people comparing notes and funny or inspiring stories about encounters with McCarthy (though these are all documented in my notes): Jose Gaudin, Mauricio Ramirez, Martijn Van Deen, Michael Conrader, Alan Sheehy, and Alex (last name unknown), Dominic Sacks. I participated in many of these conversations myself.

¹² It is relevant to note that Anderson, who once worked for Meyer Sound, is now president of a company that essentially mimics the Meyer philosophy. In short, they packaged Meyer's famous sound analyzer, an expensive proprietary hardware/software apparatus called "SIM," into an inexpensive software-only that could be easily used on Mac and Windows laptops. What before cost over \$10,000 was now around \$500—plus the cost of a basic audio interface and some measurement microphones. They also provide similar seminar-style training events to circulate the linear system ideology to techs around the world. That Anderson would so unhesitatingly refer to McCarthy as "the master" is thus a significant and telling endorsement.

Not only does this business rival recognize, without hesitation, McCarthy’s reputation as “the master”—even with unnamed clients that apparently don’t really know what McCarthy is the master *of*—but he also provides a succinct encapsulation of some of the key issues that Meyer Sound brings to the table. Namely, the idea of a “linear system” as “blank canvas”: a neutral mode of sound reproduction that adds no coloration, pleasing or otherwise. Anderson also gestures toward a certain resistance that Meyer has long encountered from widely held aesthetic judgments about what “sounds good.” Let me elaborate.

3.3.2. “Same Sound,” Linearity, and the Scientific Approach

If there is one thing Meyer engineers *don’t* concern themselves with it is “good sound,” which to them is a subjective construction firmly separate from their scientific approach. To them, good sound is the domain of aesthetics, a concern of mix engineers, musicians, and other artists (yes, in the Meyer world, mix engineers are most definitively *artists*, a major topic of chapter four). The Meyer-employed technicians who install, test, and calibrate the systems reside in the world of the sciences, where subjective judgments are meant to be purged, or at least deferred. In contrast to “good sound,” Meyer systems are meant to have “no sound” (Meyer, pers. comm., April 26, 2019) or as McCarthy puts it, “same sound”:

It is not the optimization engineer’s job to make it sound “good.” We don’t have such power. Our job is to deliver a system that has the potential to sound “good” to as many audience members as possible. The mix operator’s goal is subjective: good sound. Our goal is objective: same sound. My good is not your good, but we can agree on sameness. Generally speaking, a mix engineer will find it easier to achieve their goals when we have achieved ours. An artist prefers to work from a clean canvas. (McCarthy 2016, 434)

Here, the “optimization engineer” (Meyer-trained and certified) is the scientist and the “mix operator” (non-Meyer) is the artist.

To create such a clean canvas, according to this framework, is a strictly objective pursuit, one which has, formally at least, little use for subjective opinions (though I will interrogate this

position in chapter four). One Meyer engineer, Martijn Van Deen, told me, “here’s the golden rule for myself: I don’t discuss with people about what they hear. Period” (pers. comm., January 19, 2019). In matters of contention, what matters most is not what a client subjectively hears, likes, or dislikes, but what can be checked through measurement. For, as Van Deen says, “I consider myself a science advisor.... That is my job description.”

The dominant mathematical-sonic trope Meyer Sound folks use to guide their thinking is the concept of linearity (J. Meyer, pers. comm., April 26, 2019). As described in a recent career retrospective of John Meyer in *Mix* magazine, “the concept of linearity weaves a thread, a theme for [John Meyer’s] lifelong passion of creating better sound no matter where the audience might be” (Kenny 2014). As my own interview with Meyer demonstrated, the concept of linearity is pivotal to nearly all of his thinking. Like transparency or accuracy, linearity can be deployed to describe a system, or any portion of a signal path, that doesn’t change the overall character of a sound or signal. But while the transparency can carry with it some interpretive malleability that can slip into Sterne’s “world of magic,” the notion of linearity aims to ground sonic accuracy in science.

In the most general terms, linearity means that if the input goes up, so does the output, and vice versa—by the same relative amount. As an overall concept, linearity can be applied to all sorts of situations in which two quantities are compared, especially in terms of the inputs and outputs of a “device under test,” a mathematical function, or any other relation between two sets of values. In its most stereotypical form, we might imagine the mathematical relationship between an input and output expressed as a two-dimensional line graph (but it can get a lot more complicated than this). If it looks like a straight line, it is a linear relationship.

The two most important domains for loudspeaker design are frequency amplitude response (usually just called “frequency response,” but sometimes “amplitude response” or “magnitude response”) and frequency phase response (usually “phase response”). Frequency response, certainly the most well-known measure of a sound system’s ability to neutrally reproduce certain aspects of sound signals, describes how accurately the amplitude of each frequency in the output matches the input. One of the hallmarks of an accurate system is a “flat” frequency response, meaning it reproduces all frequencies of the input source signal equally.¹³ Phase response is less intuitive, and arguably less important to human perception, but it is a massive part of what sound system designers spend their time on. Put very simply, maintaining linear phase relationships preserves the order in which different frequency sounds arrive at the ears (on the scale of milliseconds). Among other things, this affects the perception of intelligibility and transient response (the crack of a snare or the thump of a bass drum, for example).¹⁴ It can also affect subtle nuances of timbre. Perhaps more famously, in multi-speaker systems phase differences may lead to unwanted summation or cancellation of different

¹³ Technically, a linear system doesn’t *have* to be “flat” along any particular dimension. It’s a little complicated to explain, but it essentially comes down to how you define your variables. For instance, if a system has a non-flat frequency response curve but a curve that *stays the same shape* over as different domains change (time for instance, or distance), the system can still be said to be linear along those dimensions. One particularly important manifestation of non-linearity that Meyer, both the man and the company, have made a point of eliminating, is harmonic distortion, which adds unwanted partial frequencies inconsistently across the frequency spectrum and at different sound amplitude levels.

¹⁴ The problem of non-linear phase is presented by the brute physics of any analog transduction: that the flexing and vibration of diaphragms cannot push and pull the air at all frequencies at the same time. It is simply an unsolvable problem without some type of digital correction—which presents its own problems. Likely the most valiant attempt, as confirmed by numerous sources outside the Meyer milieu (e.g., S. Cluett, pers. comm., March 14, 2019), is Meyer Sound’s recent studio monitor system, Bluehorn.

frequency waves over space, resulting in spatial dead zones, thunderous “bass alleys,” or dreaded “comb filtering” distortion.¹⁵

Importantly, linear systems theory also states that such proportional relationships must be sustained over the full range of energy levels. For example, the amount and quality of distortion, or lack of it, must stay proportionally the same the same whether the system is whisper quiet or ear-splittingly loud. This is an important distinction that frequently gets lost in discussions of sonic accuracy, for it is quite easy, and common, for a manufacturer to claim accuracy based on measurements at a certain level that does not hold for other levels (M. Reich, pers. comm., July 7, 2017; J. Meyer, pers. comm., April 26, 2019; D. Hosney, pers. comm., December 19, 2016; J. Uhl, pers. comm., January 27, 2019).¹⁶

By any method of measurement, the idea of providing measurably accurate sound reproduction has been until recently a strikingly low priority for the live sound industry. (Meyer Sound has played no small part in recent shifts; see Kenny 2014).¹⁷ For most engineers, and most manufacturers, it still isn’t much of a concern. As in other modalities of sound technology, like recording, radio, or communications, many companies have gestured toward evocative notions of

¹⁵ A bass alley occurs when certain overlapping ways interfere constructively such that a zone of space in the center of a performance space has elevated low-frequency sound. Comb filtering is the most famous form of undesired interference between two transducers. It occurs the frequency response is marked by alternating constructive and destructive interference. This patten shows up visually as a series of peaks and dips that vaguely resemble a hair comb—hence the name.

¹⁶ This sort of non-linearity was the most commonly cited issue JALC personnel had with their original JBL systems that the organization accepted as a multi-million-dollar sponsorship deal. More precisely, the systems only approached accurate reproduction when played louder than was generally appropriate at JALC (J. Uhl, pers. comm., January 27, 2017; D. Hosney, pers. comm., December 19, 2016; D. Gibson, pers. comm., April 16, 2019; T. Clark, pers. comm., March 26, 2019).

¹⁷ It has also been of surprisingly little concern in the realms of sound recording or communications, with a few exceptions like monitor loudspeakers for recording studios and some corners of the 1950s-era “hi-fi” culture and its descendants. Jonathan Sterne covers some of this ground in two important monographs (2003, 2012). Live reinforcement has been noticeably more resistant than these other fields to such approaches, for reasons I will soon discuss.

high-fidelity or “realistic” sound, but such statements, even when engaged with sincerely, have often been less about “objective” concerns and more about what sounds aesthetically “good.”¹⁸

There are a number of reasons for this non-attendance. For one, other concerns have generally been prioritized, especially trying to get as much *power* for the most feasible *cost*—a particular concern in the popular music sphere, which drives so much of the industry (Uhl, pers. comm., January 27, 2019; D. Hosney, pers. comm., December 19, 2016). This concern should not be dismissed blithely, for loudspeakers—the undisputed lynchpins of any sound system—are notoriously difficult machines to construct (see Loar 2019; Meyer 2015). Making them powerful enough, light enough, and otherwise practical enough for the rigors of live music, even with *plausibly* accurate sound, has been enough to consume decades of research and development.

Making things worse, according to all known principles of physics, truly linear transducers are a strict impossibility (see, e.g., Meyer 2015). (And the physics on this issue are well established.) Even if magical diaphragms could be found that could both stiffen and flex in all the impossible ways necessary to capture and reproduce all frequencies equally, at the same time (zero phase shift), and with no distortion, the air surrounding such a diaphragm, which is not capable of vibrating linearly, would *still* introduce distortion. One would also need magical magnets, zero resistance conductors, massless matter, and all sorts of other impossibilities. Any serious attempts to address these difficulties systematically would entail a large dedication of resources that could otherwise be used for much more attainable goals, goals of considerably more importance to the parties that drive the industry.

¹⁸ I should mention at this point that I don’t mean to privilege objectivity as an inherently superior epistemological condition. I merely wish to emphasize one way that the Meyer Sound approach distinguishes itself from the majority of other approaches, even if they express similar priorities in their marketing materials.

Moreover, until quite recently, the necessary measurement technology, and methodology to implement it, was simply unavailable. The Fast Fourier Transform (FFT) algorithm, the math that underlies any sufficiently rigorous measurement of live sound, wasn't invented until 1965, and not until the late 1970s were the resulting hardware analyzers made small enough to practically transport outside a laboratory environment. And it wasn't until John Meyer, Bob McCarthy, and a few others came along in the early 1980s that anyone came up with methods for making sense of what such machines could do in a live environment (M. Reich, pers. comm., July 14, 2018; McCarthy 2016).¹⁹

Even if all these problems could be solved, there still remains a rather important issue, one that continues to present obstacles for Meyer Sound. This is the subjective question of *how these systems sound*, and the related issue of whether anyone *wants* their system to sound like this. As the next section introduces, in the early days, the answer was generally no. In the next few pages, I will introduce some of the resistance this approach has elicited through the words of John Meyer, a key interlocutor whose biography is central to this story.

3.3.3. The Disorientation of the “Blank Canvas”

John Meyer founded Meyer Sound Laboratories in 1979 with his wife Helen Meyer. As is still true today, Helen handled the business and John handled the technology. John Meyer is even more legendary than Bob McCarthy, but because his advanced position (and age) makes him less likely to spend extensive time with stage technicians, I encountered less stories about him. I was easily able to make personal contact with McCarthy, who readily granted interviews

¹⁹ As I will discuss further in chapter four, the development of linear systems and loudspeakers coevolved with the ability to measure them (M. Reich, July 14, 2018).

and invited me to technological demonstrations, schmooze sessions with Broadway sound engineers, and, most important, sound system installations and tunings (see chapter four). But it took me over a year after first meeting John and Helen Meyer socially in Switzerland to get a sit-down interview with them (they always do interviews together). (This probably would have been considerably easier had I been able to travel to California, where they live. McCarthy, on the other hand, lives in New York.)

A child of the 1950s and 1960s “hi-fi” home audiophile movements and the associated “thinker-tinker” culture (Ellison 1995b, 31), Meyer got his professional start in his teens as a radio operator. After working as a technician in a custom hi-fi shop in San Francisco, Meyer became well-known in the 1960s for designing high quality systems for live performances, essentially bringing the home hi-fi concept from the home into the field (Meyer 2012).²⁰ Important landmarks included Meyer’s short-lived company Glyph,²¹ which in the late 1960s produced massive audiophile-style speakers for a few venues in the Bay Area, and a well-received PA for the 1967 Monterey Pop Festival. Meyer later worked at McCune Sound Services, a pioneering San Francisco manufacturer and supplier—which one trade journal called “one of the epicenters in the birth of the modern P.A.” (Kenny 2014). At McCune, Meyer

²⁰ In the 1960s and into the 1970s, almost all live sound systems were thrown together by mix engineers, generally from a hodgepodge of components either custom made by local shops (or the engineer themselves) or drawn from a variety of different local and regional manufacturers. This could mean anything from cinema speakers to home hi-fi amplifiers. The notion of a national manufacturer producing entire systems—speakers paired with matching amplifiers and other components, and with and any coherent concept for combining them—did not exist. Especially not for live, amplified music for large venues. For years, the putatively simple problems of power and reliability were daunting, rendering ideas of transparency or accuracy extravagant. For example, as John Meyer once recalled, in the early 1970s, “Making it through 10 shows in a row without any failure was the goal back then.... Making through an entire tour was a really big goal. But in the early 70s, people didn’t care if the sound went off for half an hour and came back on. They’d just go party” (D. Johnson 1999). In this scene, John Meyer’s focus on accuracy in sound reproduction placed him among a select few trying to bring such goals to the live sound world.

²¹ The Glyph designs, some of them with speaker cones eight feet in diameter (in a striking white color), gained a bit of a cult following and are still remembered as classics—even if they never took off as products (see Ross 2015).

designed the JM-3 speaker system,²² which would “establish itself as a totem of seventies rock” (Ross 2015) while inspiring many technicians to seriously ponder, for the first time, the possibility of accurate and intelligible concert audio (McCarthy 2008).

After working on transparent reinforcement with Stanford University and the San Francisco Opera, Meyer was hired to establish an acoustics laboratory at the Institute for Advanced Musical Studies in Montreux, Switzerland. Mandated to develop a transparent loudspeaker appropriate for classical music, Meyer set about researching the mechanical sources of loudspeaker non-linearity, in hopes of developing a speaker that could correct any distortions. The job came with a full research staff and the budget for enough audio equipment, as Meyer told me, “to buy two apartment buildings in Albany” (pers. comm., April 26, 2019). The resulting research led to Meyer’s first patent, for an approach to linear loudspeaker design that, Meyer told me, is still the foundation for much of the work the company does. (At the broadest level, the concept is that by closely measuring each component’s distortion at the mechanical level one can introduce electrical and mechanical compensation to even out the overall sound.)²³

²² I say speaker “system” here because the JM-3, like virtually all Meyer loudspeaker products since, was more than what we generally think of as a loudspeaker: a cabinet containing, to simplify, one or more vibrating surfaces paired with magnets and voice coils linked that receive analog signals from outside the box. In such a “passive” set up, which is still common, the speaker cones and drivers would then be hooked up to an amplifier (outside the speaker cabinet itself) to provide enough energy for the reproduction of sufficiently powerful mechanical waves. Because amplifiers, drivers, and speaker cones all have their own natural tendencies to distort, it is essential not only that they all be high quality, but they are paired to complement each other. (The home hi-fi world knows all about this issue.) John Meyer, and especially Meyer Sound Labs, has been the leader in a decades-long trend toward a “systems” approach that pairs all of these elements together, believing this to be essential to the linear approach to sound reproduction. Further, in the JM-3 and beyond, Meyer’s philosophy has been to various forms of *correction* to this combined assemblage, either electronically or mechanically. So, the JM-3 speaker system did not consist only of the speaker cabinets we associated with the word “speaker” but racks of outboard gear conditioning the signals just so. Today, all this happens inside the literal black boxes we call loudspeakers (though there are other forms of processing and correction that I will discuss at length below and in chapter four).

²³ The research also provided some of the most pivotal early insights on how to measure sound, which I will discuss more in chapter four.

Patent in hand, John and Helen Meyer returned to the United States in 1979, founding Meyer Sound Laboratories the same year.

Resistance to Meyer's ardent dedication to linearity manifested promptly. In an oral-history interview, John Meyer described one of the company's earliest jobs in live sound, which was to build a sound system for a Frank Zappa performance in San Francisco. Meyer constructed a "neutral system" which could provide, at least to the technological standards of the time, accurate sound with no coloration. According to Meyer, Zappa and his band were accustomed to systems that added a certain character to the sound—that is, they "expected the sound to be *enhanced* by the system" (Meyer 2012). In contrast, to the musicians, Meyer's system sounded bland and lifeless. As time was running out before show time, Meyer decided their best bet was to simply use microphones to capture the output of Zappa's rehearsal PA—a small portable system the band used in the hotel, which added a distinctive sound they liked. This distorted sound would be captured by the microphone, then, as an electrical signal, would be transmitted to the speakers for transduction back into mechanical vibrations.

Because the signal's whole journey between the microphone's electrical output (the input into the Meyer PA) and the loudspeakers' mechanical output (the output of the PA) should be linear, the end result would be a faithful, neutral representation of the smaller distorted PA.²⁴ On a tight time frame, John Meyer judged this the best chance to approximate the desired coloration

²⁴ An even more intuitive analogy might be found in the relation between a solid-body electric guitar and its amplifier. Since such guitars have virtually no sound at all, they depend on the amplifier to provide it. In the relation obtained between the guitar's electronic componentry (which could be argued *have a sound* even though they cannot *make a sound* until connected to an amplifier) and its amplifier a guitarist may attain their desired sound. Guitar amplifiers are especially designed to have character, to *add* something, and are thus not unlike an extreme example of a typical PA system: not neutral, adding (hopefully pleasing) patterns of distortion. If one plugged the guitar directly into the PA, it would "work"; the system would indeed amplify the signal. But it would sound extremely off-putting, so much have we been accustomed to the tone of the amplifier.

that the band enjoyed from the bigger PAs they usually used. In this case, Meyer's neutral system was a problem to be overcome. Adding no coloration where an enculturated listener would expect it, the linear system gave the impression of *taking something away*—when, from the perspective of linear-systems theory, the system was neither giving nor taking.

In the interview, Meyer described this phenomenon through a culinary metaphor, referencing how a recent city ordinance in Berkeley, California, where Meyer Sound is located, had restricted the amount of salt a restaurant could put in its food:

If you make the [system] neutral, then you've got to figure out how to put back what it is that you took away. It's kind of like, uh, like in Berkeley.... You can't put salt in anything anymore [because of local regulations]. So, you've got to make sure you get salt, you know, because they, they, they're on kind of a salt free mode right now. So, soup and everything you get is kind of bland, you know. But you—at least you put salt back in it, you get little packages and put it back in. (Meyer 2012)

Meyer goes on to describe how, like adding salt to one's savorless soup, one can easily restore any “loss” of coloration from a linear system with various filters and effects. Why add an extra step? Why create a sound system with “no sound” of its own—a saltless concoction, free of the sonic flavor that listeners (including audio professionals) have come to fancy—if you ultimately have to “put it back in”?²⁵ Essentially, because it's much more difficult to take salt out of a bowl of soup than to put it back in after it's made. Analogously, the most consequential distortions introduced by a non-linear sound system cannot be simply filtered out after the fact, while they *can* be easily *introduced* to a clean signal.²⁶ Further, one never knows what kind of seasoning a

²⁵ Incidentally, these days the idea is to add the desired sound at the mix console stage of the signal path, primarily through the use of digital effects.

²⁶ For another example, imagine a heavily distorted Jimi Hendrix guitar recording: the technology doesn't exist, and probably never will, to recover the original, pre-distortion sound signal directly from his Stratocaster, but if we did have that clean signal, it would be a relatively straightforward task to recreate the distorted version by using the same amps and other gear.

particular ensemble or style of music might call for. A system that sounds great pushed to the max and distorted, say for a pop music festival, might sound aesthetically inappropriate in a quiet jazz room.²⁷ Hence the Meyer Sound philosophy posits that it is preferable to add the desired color to a blank canvas than to start out with color in the first place.

The disorientation that this “blank canvas” can cause is still a sticking point for many of the company’s potential customers. Numerous engineers, and even Meyer technicians, acknowledge that the linear systems approach can require more work at the console, especially if the mixing engineer’s goal is to recreate the coloration they might otherwise get from their preferred loudspeaker brands (e.g., M. Reich, pers. comm., July 7, 2017; M. Ramirez, pers. comm., July 2, 2018). Indeed, as an indicator of how rare it is to find truly transparent systems, and how this remains a hurdle in some places, I heard on more than one occasion engineers describing Meyer systems (or describing the stereotypical bias about them) as “too bright” (e.g., D. Tabachnik, pers. comm., July 7, 2018; T. Clark, pers. comm., March 26, 2019; M. Reich, pers. comm., July 7, 2017). Essentially, because many listeners have become accustomed to systems that color the sound toward the warmer end of the spectrum (lower frequencies), a neutral system ends up sounding like it favors higher frequencies.

Despite these biases, one must make no mistake about it: Meyer Sound is firmly established in the highest elite of sound system manufacturers. Though many engineers cite legitimate qualms about the difficulty of installing Meyer Systems (which generally require multiple days of paid work by Meyer employees) and certainly their *cost* (my interlocutors generally indicated that Meyer is *the* most expensive, even among the elite providers), it would

²⁷ This was precisely one of the main beefs with JALC’s earlier sound systems by JBL (D. Hosney, pers. comm., December 19, 2016; J. Uhl pers. comm., January 20, 2017).

take the rarest form of sound partisan to make a serious complaint about the sound of such a system (e.g., D. Tabachnik, pers. comm., July 7, 2018; M. Conrader, pers. comm., May 3, 2019). Meyer Sound has been commercially successful and is now one of the biggest, and certainly most respected, companies in the live sound industry (and beyond). And, as I will return to later, much of the industry has started moving in this direction, especially with big-budget venues and touring productions that can afford to buy or rent high-end systems and to employ technicians with the training to take advantage of them.

3.4. Memory and the Imagined Ideal

So far, I have presented two closely related models of “fidelity,” both of which play a key role in defining and attempting to conjure a “pure and clean” sound at Rose Theater. The discussion of Meyer Sound speaks to an attendance to the western-rooted technological specificities of fidelity that, more than most epistemic communities, abstracts their objects of analysis from human social entanglements and places them in a world of technoscientific measurability. This approach entails no concern with “capturing the world” or maintaining an authentic, natural connection to acoustic reality. Such ambitions are simply outside the firmly defined domain of Meyer Sound’s epistemological responsibility.

The other approach is indicated by Jonathan Sterne’s work and its modifications by Whitney Slaten. Both challenge notions of fidelity contingent upon stable and preexisting “original” sounds, proposing instead that both originals and copies are produced in the social-technological process of mediation itself. Here, the cherished quality of “liveness,” as Slaten

explains, is constructed as much by sound technicians as musicians, with technological networks playing a crucial role.²⁸

The key characteristic both of these approaches share is a fundamentally binary structure. While each differently defines such binaries as original/copy, before/after, and input/output relations, both are nonetheless constructed around two poles, with technology in between. This model is an important one, an intuitive and logical one, and one that has been at the heart of countless technological and creative advances. And, at JALC as elsewhere, it is approached with seriousness and sincerity.

Yet my ethnographic materials present an alternative way to think about the relation of fidelity that complicates—and coexist with—this binary logic. Sterne and Slaten are both right about the socially constructed, technologically networked nature of “original” sounds and the relations of listening. Still, JALC’s approach to reinforcement cannot be fully accounted for through a binary approach that separates captured sounds and their reproductions. Instead, as I will demonstrate in this section, in Rose Theater, both the production and reproduction of sound—which in the discourse of fidelity are two firmly distinct processes—overlap and entangle in both time and space.

3.4.1. Imagined/Remembered Acoustic Sound as “Original”

In Rose Theater, a listener encounters an elaborate intermingling of vibrations from speakers, instruments, walls, and all manner of living and nonliving material bodies. Here is Doug Hosney:

²⁸ Slaten does not go quite so far down the new materialist road as I do, which posits the interaction between humans and technology as more of a collaborative “human/non-human working group” (Bennett 2010, xvii).

One of the most beautiful concerts of Jazz at Lincoln Center’s orchestra, the big band, is: a quiet room, nobody running around, and totally acoustic.... It’s beautiful! Now, you put 1,300 bags of water—people [*laughter*—in a room: it changes the dynamic. At which point you might lift it with the PA [i.e., amplify the band]. But I want to lift it [in a way] that approximates what it sounded like, or gets to as close as it can to what it sounded like, when I was just in here by myself. In other words, where the room is actually responding. (D. Hosney, pers. comm., December 19, 2016)

When Hosney takes a seat in the empty house during rehearsal, he hears much more than the sound of the band; he hears a constellation of acoustical interactions between these sounds, the material architecture, and the countless other massive bodies in the environment (air, humans, cups of coffee, etc.). It is in this complex system of vibration, whose untamable complexity resists any comprehensive description, where we might find the closest thing to an “original” sound.

When an audience comes in, everything changes. Throughout the house, reflective surfaces are now draped and saddled with absorptive materials like clothing, personal effects, and all those sticky bits that make up a person—skin, organs, and yes, water.²⁹ Imagine the band playing to this full house, with no amplification. The waves leaving the stage commence their travels on more or less the same paths as during rehearsal, but upon encountering the new “bags of water” in the audience, they start to behave and interact quite differently. Some waves are soaked into the skin, clothing, and personal effects; some reflect off the same surfaces, embarking on new and largely unpredictable paths. The music is quieter. The room is less “live.” The audience “warms up”³⁰ the room (D. Gibson, pers. comm., April 4, 2019). The ideal sound has effectively evaporated, the room no longer “responding” as desired.

²⁹ The temperature also changes, altering the way sound vibrates in air. This is important, but in the interest of simplifying an already irreducibly complex system, I won’t discuss it in the main text.

³⁰ The audience “warms” the sound by absorbing higher frequency sounds so that the lower ones are proportionally louder.

We may no longer, if we ever could, imagine an original sound located in any particular, isolatable place. Even this entirely acoustic experience, an unamplified band playing in a room full of patrons, doesn't fulfill Hosney's sonic ideal. Instead, when the seats are filled, that ideal sonic experience, which the mediated experience aspires to faithfully replicate, resides somewhere between imagination and memory. It exists primarily in a remembered impression of an imagined experience—what the band, and the room, *would* sound like if only the patrons themselves were not there.

The situation doesn't get any simpler by shifting our focus from the "original" to its "copy," another binary concept that loses much of its explanatory utility the closer we examine it. Indeed, like the tangled, overlapping "original" described above, the mediated "copy" does not reside in any one particular place, or even many places. It certainly doesn't come out of the speakers, where one might typically understand the "end" of the mediation process to be. Indeed, the sound from the speakers themselves doesn't remotely resemble the acoustic ideal Hosney finds so beautiful. If you stuck your head right in front of any speakers in the room, you'd hear neither an "amplified copy" of the onstage sound nor a "mixed" version of the full band. Nor would you hear the sound image of "what it sounded like" in Hosney's idealized experience (with all those indispensable aural artifacts of the "the room actually responding"). Instead, you'd hear, to put it too simply, those sounds that have to be added *in response* to the human "bags of water" that disrupt Hosney's solitary ideal. The waves discharged from the speakers comprise just one component of an interlocking puzzle.

We already encountered an analogous example of this dynamic in chapter one, when David Robinson demonstrated some mixing techniques he uses for the JLCO. Recall how Robinson muted and unmuted the entire sound system during a JLCO rehearsal, allowing me to

hear subtle differences in the piano and bass. All the rest of the instruments were already producing enough acoustic sound to be heard easily. To oversimplify, the PA system added the underrepresented ones. The speakers themselves, when unmuted, were reproducing only piano and bass, and a slight hint of horns. Only in the interplay between these amplified supplements and the unamplified sounds from the stage—not to mention the incalculable reflections and absorptions of the physical materials in the room—does one find an approximation of the sonic aesthetic JALC prizes.³¹

This simplified example doesn't even get into the acoustic effect of the patrons themselves. But it shows that even before any visitors arrive, the desired “acoustic” sound does not exist without some gentle amplified tweaks. As in Hosney's quotation, the ideal sound, the “original” to be reproduced, exists more in the mind than in the room, an idealized dream of a technology-free world in which, somehow, instruments are balanced just right, all of them audible, clean, and clear. The distinction between original and copy thus loses much of its salience, as both emerge in the overlapping of vibrational energy from instruments, voices, speakers, and their reflections and absorptions throughout space

3.4.2. “A Little Extra High End”: On Frequency and Flatness

To further understand the interaction between amplified and unamplified sound, let me return briefly to the concept of frequency response, a notion that would seem to mesh elegantly

³¹ Of course, as soon as they leave the speaker or instrument or human body, *all* of these vibrations are of the same mechanical variety. Whether they were at one point transduced into analog oscillations or patterns of digital bits is of little import at the level of quivering air molecules. Yet it is still useful to distinguish them conceptually, not least because a human listener is quite capable of classifying two types of sound arriving at the ear—sorting out which sounds are coming from the instrument and which from the speakers, despite the extraordinary number of different vibrational patterns coming from all sorts of sources at the same time. And, perhaps most important, separating these two regimes of sound is precisely how my interlocutors think about it.

with some of the sonic ideals Doug Hosney listed above—amplifying “as transparently as possible,” for instance, or without “changing the sonority or the tonal quality.” When I asked Hosney if such ideals implied a flat frequency response, he added considerable nuance:

It is *essentially* flat. But what you hear when you’re in a room with a bass is, you know, the *bong* of the bass. But you also hear the *tck-tck-tck*, of the of the fingering. As you get away from it, the larger waves [lower frequency] still get to you, but you lose some of the articulation [in higher frequencies].... So sometimes what you’re doing at the console is putting a little extra high end on the bass so that it translates out to the house to hear what *appears* to you to be flat. (D. Hosney, pers. comm., December 19, 2016)

Again, the sound from the speakers is purposefully *different* than the sound transduced by the microphone, a deliberately unfaithful representation with “a little extra high end on the bass.” Why? Because the unmediated “acoustic” sound—the waves that travel through air (and reflect off surfaces) to the listeners ears—is *also* unfaithful to the source. For air itself is far from a neutral, disinterested intermediary. The physics of waves tells us that all sound dissipates with distance from its source, but higher frequency vibrations dissipate more quickly, and at a smaller distance, than lower ones. So even if an engineer could coax a flat frequency response from the speaker (no easy feat), the higher frequencies (carrying the all-important “*tck-tck-tck*” of bass articulation) would be disproportionately attenuated when they reach the listener’s ears. The solution is for the system to add an inversely distorted signal so that, in combination with the acoustic waves from the instrument itself, the ideal bass sound emerges.

Hosney’s “little extra high end” thus points toward a vibrant site of negotiation between the material behavior of the space and a host of imagined relationships between musicians and listeners. The sound system, operated by an engineer responding to the barrage from waves meeting their ears, is purposefully unfaithful so that it might counter the infidelity of the air, the room, and the untold mechanical interactions throughout the space. Higher frequencies are amplified more than others so that they might interweave with the inversely distorted acoustic

vibrations to form “what appears to you to be flat” (D. Hosney, pers. comm., December 19, 2016). Attaining the desired acoustic ideal is thus a complicated, negotiated, and surprising affair.

For no matter how meticulously one constructs a sound system, the listener is always situated in material space, surrounded by material bodies of all sorts, none of which, when placed under close examination, are transparent, neutral, or inert. And they are far from predictable. What is crucial to my argument here is the sheer complexity of musical, material, and technological relations that must be negotiated in the moment—and, more pointedly, *in the space*—in order to conjure the illusion of mediation-free experience. This dynamic relationship is not merely complimentary but reactive, contested, and, dare I say, improvisational.

3.4.3. How Meyer Relates to JALC’s Overlapping Approach

Superficially, this highly interactive mode of mediation seems fundamentally different than Meyer Sound’s clinical, abstracted mode of thinking about the networks of black boxes and wires tasked with doing the same thing all the time, under any conditions. But it isn’t, really. Among other things, without the linearity provided by Meyer’s linear systems, JALC’s conjuring of technology-free sound, and the illusion of a pure, “acoustic” experience, would likely be impossible. Indeed, though I described a hybrid, overlapping assemblage of amplified and unamplified sound, any of the sounds and signals that pass through electroacoustic transductions and transmissions are dependent on precise, accurate equipment. For example, if one wants to boost some frequency bands of an acoustic bass to get more articulation, as I just described, the illusion of naturalness will likely be subverted if such changes are not accurately reflected in the

vibrations coming out of the loudspeakers.³² Also, in a widely documented phenomenon, “acoustic” sounds, like the human voice and the instruments associated with the type of jazz performed at JALC, are disproportionately susceptible to the kinds of colorations and distortions that electroacoustic transducers might add (Winer 2018).

One principal reason is rooted in the complexity of such sounds’ overtone profiles—and the perceptual salience such overtones carry for enculturated listeners. This is because so much of the perceptual distinctiveness of such instruments—that is, what makes a violin sound like a violin, or what makes a Stradivarius sound like a Stradivarius—is located in their distinctive harmonic resonances. When they are lost, such voices and acoustic instruments lose much of their character and recognizability.³³ This is a significant problem for sound reproduction, for such overtones have the greatest potential for destructively interfering with each other in a non-linear system (what is known as intermodulation distortion). Such resonances are also more likely to exacerbate any existing distortion artifacts previously existing in the system or speaker itself (such as harmonic distortion).³⁴ In the phase dimension, any non-linearities may

³² It also, of course, requires accurate processing devices, in this case equalization, which are not as unproblematic as we would hope.

³³ “Electric” instruments and mixes certainly have complex overtones, too, but since they are generally more “distorted” already, the non-linear transparency has been generally considered to benefit them less (D. Hosney, pers. comm., December 19, 2016). For a textbook example, consider the sound of electric guitar. Even when processed “clean” through an amplifier, the resulting is basically nothing but non-linear distortion (different changes are made to the sound depending on level, frequency, and all sorts of other factors). When distorted for artistic effect through overdrive or intentional feedback, the phenomenon is even more obvious pronounced. In such cases, adding distortion in the reproduction phase has not been deemed as destructive as in acoustic forms, like some jazz or classical (e.g., D. Hosney, pers. comm., December 19, 2016).

³⁴ I should also mention that, from a scientific perspective, there really isn’t much difference between these “pleasing” distinctive resonances and those that folks like John Meyer have made it their mission to eliminate in loudspeakers. They are also textbook examples of non-linearity: they occur differently at different dynamic or frequency ranges, and in any number of different ways they can be made to emit sound.

disproportionally affect acoustic sounds, where the “attack” of an instrument has a considerable effect on the overall perception of the instrument’s tone (Winer 2018).³⁵

Further compounding the importance of linear reproduction to the JALC approach is the fact that filters like equalization, used above in the acoustic bass example, simply lose their effectiveness in a non-linear signal chain. Specifically, if a system responds differently at different overall amplitudes (volumes), any equalization (EQ), which is linear across all amplitudes, will unpredictably boost and attenuate different shapes depending on how loud an instrument or voice is resonating at any given moment (which can be a question of milliseconds) and in which frequency range. This can represent a particular problem for acoustic jazz.

For instance, in the jazz played in Rose Theater, aesthetic value resides in perceiving the difference between the softest and the loudest sounds, and hearing full spectrum, undistorted sound at all times. In contrast, most forms of popular music are generally more dynamically compressed, meaning there is less difference between the quietest and loudest parts of a performance.³⁶ With dynamically compressed audio, the need for sound systems to maintain linearity at different energy levels is less important, since the material stays within a more limited dynamic range, making it easier to accommodate any nonlinearities with filters like EQ.³⁷

³⁵ One effect of phase non-linearity is that different parts of the sound can arrive at the listener’s ears at slightly different times, which, at the very beginning of a sound’s arrival (the “attack”) greatly change sonority of the acoustic event. Even for a sound that sustains over a comparatively extended period, like a piano key being held for a few seconds, the initial milliseconds can greatly alter the perception of the *whole* duration of the sound—in my opinion one of the quirkiest aspects of human hearing. I am consistently amazed at how much a piano can sound like a string instrument when the attack is unintelligible.

³⁶ This has nothing at all to do with the type of *data* compression that has to do with reducing the amount of data to encode digital sound—as in the MP3 and many other algorithmic formats.

³⁷ For a competent attempt at making sense of dynamic compression from a social sciences perspective, see Devine (2013). I quibble with Devine’s opposition of loudness and fidelity, as well as some other instances binary logic. For example, Devine separates users’ “actual use” of sound reproduction technologies, and the very idea of

On the other hand, jazz, in order to sound natural and aesthetically proper, requires transparent reproduction whether quiet or loud, a fact that is well-documented in the literature and was mentioned numerous times in my fieldwork.³⁸ All of these salient features of the music can easily be lost with a less linear system, impairing any relation of fidelity, however overdetermined it might be.

3.4.4. “Strong Magic”

The preceding analysis shows us how originals and copies can coexist in time and place. It also shows how amplified and unamplified waves can overlap in an assemblage-like mediation between such originals and copies. Let me now expand on another distinctive aspect of this arrangement: that it paradoxically hinges upon a “natural” ideal of acoustic sound that could never exist without electroacoustic enhancement. Put very simply, partly aided technology’s increasing ability to present listeners with plausibly “acoustic” sound while actually enhancing various perceptually desired elements, we have come to imagine technology-free spaces as better sounding than they ever have been—or will likely ever be. Indeed, listeners have been conditioned to imagine natural sound very differently, even outside the relation of reproduction.

Such an arrangement requires technology with a level of basic functioning that Sterne’s historical listeners could only dream about (and dream they did!). In Sterne’s analysis, early phonography and telephony were so distorted that humans were required to “help the machine”

“listening”—which to him favor “loudness” over “fidelity”—from the technological ideals of the machines themselves, which apparently, for Devine, favor fidelity. Still, Devine’s account provides a worthy social history of an important issue that deserves any attention it can get. See also Milner (2010).

³⁸ See John Meyer (pers. comm., April 26, 2019); Bob McCarthy (pers. comm., December 13, 2018); Tom Clark (pers. comm., March 26, 2019); Sam Berkow, (pers. comm., February 26, 2019); Doug Hosney (pers. comm., December 19, 2016); John Uhl (pers. comm., January 27, 2019); Kirchberger and Russo (2016).

(2003, 251). This entailed considerable labor just so that a basic level of function could be attained—or even imagined. As Sterne states, “when sound-reproduction technologies barely worked, they needed human assistance to stitch together the apparent gaps in their abilities to make recognizable sounds” (246). This human assistance came in both practical, embodied form (bodily contortions, tactile manipulations of devices, etc.) and audile techniques, culturally specific modes of listening that allowed auditors to sustain their faith in reproducibility in the face of these technologies’ obvious imperfections.

In contrast, the technology at Rose Theater, to the extent that listeners consciously contemplate it at all, is simply expected to work. Only when it doesn’t work does anybody take much notice. And when such rare breakdowns are detected, the standard response of audience members is not to “delegate their skills to technology in order to help it work” (Sterne 2003, 247), but, much more likely, to simply blame the operator³⁹—thus accentuating the basic point that, in venues like JALC’s, professional sound reinforcement is simply expected to transparently go about its job unnoticed. This arrangement requires little labor or faith from the listener, opening a space for a new relation of fidelity, one with a new kind of “original” to which the process of reproduction aspires.

More specifically, we find a kind of unconscious faith in a deeply affective—and primarily unconscious—feeling that “acoustic” sound can be simultaneously reverberant, balanced, and clear, where a listener may aurally distinguish musically salient sonic materials without the aid of electronics. Put simply, the “natural” ideal—the imagined original that JALC

³⁹ This phenomenon is widely known and document. See, e.g., field notes (May 17, 2019); A. Sheehy (pers. comm., April 15, 2019); J. Gaudin (pers. comm., July 2, 2019). Whitney Slaten also provides numerous relevant ethnographic anecdotes, especially in his discussion of mixing outdoor “Jazzmobile” concerts from a console position in close proximity with audience members, many of whom were uninhibited from expressing their opinions, both positive and negative (2018, 58–130).

engineers endeavor to reproduce—is something that one would never find in a real, material room without some electroacoustic assistance. Indeed, nowhere in the world is there a room the size of Rose Theater where one could clearly discern the “*tck-tck-tck*” of bass articulation, no matter how quiet or empty. There isn’t a room in the world where one could hear a perfectly audible and clear balance between the piano and horn sections of a jazz big band, or the individual voices of different sections of the orchestra. In a sense, rather than requiring listeners to turn a deaf ear to technological imperfections, they are instead prompted to disregard the fact that an acoustic room simply shouldn’t sound so “pure and clean.”

This new “world of magic” is reflective of years of aural entrainment that has conditioned audiences to expect what might be described as an unnatural natural sound. For experienced professionals, such changes in audience expectations are not surprising. Bob McCarthy alludes to something very similar in a witty fictional vignette:

Great news! We just received the sound design contract for Rogers and Hammerstein’s *Carousel*. The venue is the 1600-seat Majestic Theater, the same as its 1945 debut, which is highly rated for its excellent acoustics. It’s the original orchestrations in the same pit. No stage automation and moving (noise-generating) lights. A revival to rival all revivals. Obviously we don’t need a sound system. If we believe natural sound is best, we should resign the project. The original show was composed and staged for natural sound. How can we presume to improve upon this? The following problems arise: The director hates it, the performers hate it, the audience hates it, and the critics hate it (except for the 90-year-old one). The show closes in a week and we’ll never work on Broadway again. What’s changed? Expectations. Audiences no longer expect natural sound. They expect magic sound delivered without the slightest effort required. Sonic “couch potatoes.” Get used to it. It’s not a fad and it’s not just the audience. Performers want magic sound too. They want to act and sing with a wide dynamic range and still be heard at the back. That takes strong magic, but that’s our job. (McCarthy 2016, 208–9)

There is something remarkably similar to this “strong magic” going on in Rose Theater. Like the theater goes in McCarthy’s hypothetical, Rose listeners hold expectations that would be largely disappointed if not for the tactful intervention of the sound system and its support staff.

Slaten also uses the idea of magic in describing an experience he had as a patron at a production of *Porgy and Bess* at the Richard Rodgers Theater (which, incidentally, used a mostly Meyer Sound PA). As he sat in his seat, looking around at all the different pieces of technology (microphones, speakers, etc.), Slaten tried to discern their effects on the sound. It was difficult: “I normally had a knack for speculating about settings like this, but for once I was stymied. In that moment, I didn’t feel like a live sound engineer. I didn’t feel like an ethnographer studying and unveiling aspects of sound reproduction at live performances. Instead, I felt as if the form of sound reproduction I was experiencing encouraged me to encounter the vast majority of production techniques as hidden, as somehow magical, indeed as *transparent*” (Slaten 2018, 216–17).

Though I make no claim of “perfect reproduction,” we see in both McCarthy’s and Slaten’s examples—and in my own observations at JALC—an endorsement of the *plausibility* of the idea that mediation might recede from awareness. Both speak strongly to the changing expectations of listeners, especially that they might be provided clearly recognizable sonic reproductions with minimal or no detectable side effects.

What I want to emphasize, though, are not only ideas of clarity and transparency—that musical details can be discerned and the technology recedes from awareness—but the manifold ways that such ideals are manifest in interaction with the “natural” acoustic of the room. In Rose Theater, we find not only a demand for clarity, dynamic range, and coverage (that the music should be “heard at the back”), but a heightened pretense of naturalness. We are meant, quoting Doug Hosney again, to feel a natural environment “where the walls are really responding” (pers. comm., December 19, 2016).

These machines and systems not only work—and work effectively—but they enhance the perception and expectation of *acoustic* space so deeply that our very ideas of unamplified sound are reshaped, if subtly. This is not restricted to the ideas of transparency or “cultivated hiddenness” (Slaten 2018). It is an assertion of plausibility that, absent technology, a room could sound this good, walls and all.

Sterne writes that in a fundamental tenet of the philosophy of mediation the perceivable presence of technology entails a kind of “debasement” of an ontologically prior, and more authentically “auratic” (à la Benjamin), original sound. In such an arrangement, detectability engenders a “loss of being.” But in Rose Theater, we have an aesthetic and ethics of enhancement, not only of what we hear in an environment reinforced with electroacoustic technology, but also in our imaginations and expectations of mediation-free experience. The system doesn’t only enhance the reproduction; it enhances the imagined original. It enhances our very foundational assumptions about what natural, technology-free space *should* sound like—regardless of whether it ever *could*.

3.5. Conclusion: Rare Magic

I agree with Bob McCarthy that it “takes strong magic” to foster an environment like what I observed in Rose Theater, where “a piano sounds like a piano,” and where most anyone in the room can hear an acceptably nuanced reproduction of bass articulation. As this chapter has shown, such an endeavor requires an exceptional mix of high technology, professional expertise, and multifaceted ways of dealing with the relationships between imagined originals and aurally overdetermined copies.

This strong magic is also a *rare* magic. As I have discussed, Meyer Sound is one of the few large players in the development of live sound technologies that take issues of transparency

and accuracy seriously, and their investments in science as a source of epistemological and practical authority is distinctive to say the least. We would also benefit from keeping in mind that that a growing majority of human encounters with musical sound currently occurs beyond any proximity with “live” musicians. Such encounters have often been precipitated by a growing multitude of sound-reproduction devices designed more for affordability and convenience than accuracy or transparency. Indeed, as Jonathan Sterne has argued in numerous works (2003, 2012, 2015), it is simply unsupportable to think of the history of sound-reproduction as a story of increasing verisimilitude, despite widespread ideological commitments to the contrary. Of particular note has been the broad ascent of “lossy” audio compression, combined with increasing use of mobile phone technologies and streaming services as primary points of contact with mediated sound, which has generally left little room for the ideals of technological transparency as I describe them here. Moreover, similar to some of the resistance Meyer Sound’s “neutral” approach has encountered, there has been little aesthetic demand for accurate recording formats or equipment.⁴⁰

The field of live sound reinforcement is something of an exception to this wider general field of audio. Indeed, as I continue to demonstrate in the next chapter, while listeners to recorded and broadcast audio have generally been experiencing a *decrease* in general audio quality over the past few decades (see Sterne 2012), the concert industry has, across many genres and contexts, increasingly made positive progress on issues of intelligibility and accurate reproduction. This isn’t to say that this industry has bought in to the “neutral” approach—though the virtues of such an approach are certainly gaining increasing acceptance—but it is certainly

⁴⁰ Even in the contemporary manifestations of “audiophile” culture display

true that listener demands and technological standards have been swiftly evolving toward a broader expectation of increased intelligibility and consistency of sound. Beyond music, attendance to high-end sound has also increased in applications such as education, business, government, the restaurant industry, and even “aural architecture” (e.g., Blesser and Salter 2007a; J. Gaudin, pers. comm., July 3, 2018; D. Bigg., pers. comm., July 5, 2018). Meyer Sound has been a leader in such shifts.

Yet even today, as “scientific” approaches to system design have been gaining considerable steam,⁴¹ the clinical approach to linear sound transmission found in JALC’s spaces is a striking display of science and technology. It is a worthy representative of many of the promises about sound technology that have long trumpeted but rarely taken seriously. This very rarity, and the sheer difficulty involved in aligning so many different artifacts and ideas, foregrounds the importance that JALC places on the very idea of acoustic sound. Most important, it emphasizes how purposefully JALC aligns its acoustic environment with western art-world ideas about unmediated “natural” sound.⁴²

And it places jazz firmly at the center of western ideas about technology as a mode controlling sound, space, and experience as a scientific pursuit. As Jonathan Sterne writes, “sound-reproduction technologies represented the promise of science, rationality, and industry and the power of the White man to co-opt and supersede domains of life that were previously considered to be magical” (2003, 9). In a certain sense, Meyer Sound and its adherents at JALC

⁴¹ I discuss this trend extensively in chapter 4.

⁴² See Thompson (2002); Tommasini (1999, 2013) for examples of the classical world’s aversion to technology. I should also note that the “classical” technological ideals I’m referring to are only a subset of the western art music world. Of course, technology has had a considerable influence in twentieth century western music, with concert hall’s preeminence increasingly decentered over the twentieth century (see, e.g., Crawford 2001, 689–713).

are taking this sprawling project of “acoustic modernity,” as Sterne puts it, to the furthest reasonable extreme, and in one of the most putatively “magical” “domains of life”—live musical performance. I will pick up these arguments in the next two chapters.

Chapter 4: Tuning the Room: On the “Arts” and “Sciences” of Sound and Space

4.1. Introduction

This chapter briefly steps away from my close attention to jazz to dig deeper into Meyer Sound Laboratories and its distinctive approach to thinking about and manipulating sound. I have two main goals. The first is to demonstrate Meyer Sound’s philosophy of sound reinforcement, system design, and optimization, as well as the technologies and methodologies for putting them into practice. I highlight how the authority of science is mobilized to proffer an ontology of sound reinforcement as objective and technologically controllable. To simplify, this first aim is to show how the technology works and what it means. Or, at least how it’s *supposed* to work and what it’s *supposed* to mean. The second goal is to demonstrate how these ideas and artifacts are put into practice—“in the field,” as my interlocutors say—which I reveal to be far from a straightforward exercise in scientific disinterest and objectivity. On this point, I analyze what Meyer Sound calls *system optimization*, or, more informally, “tuning.” Room tuning is a complicated process through which highly trained operators measure and calibrate a range of quantitative sonic parameters to make sound systems, and their interactions with their physical surroundings, “physically perfect” (M. Reich, pers. comm., July 14, 2018). I show how the material practices of room tuning are a contested meshwork of modes of knowing and doing. I show that live sound reinforcement is never neutral, never vanishing, even if the labor that goes into making it work is entirely unknown to the audience—and to many of the technicians that work in the room on a daily basis. Put differently, I show how the process of tuning the room, and the aural experience of occupying the resulting sonic space, is “relational and contingent, situated and reflexive” (Feld 2017, 86). It is a necessarily complex and often confusing material

network of interactions between actants, both living and non-living. And it is at all points contested (Sakakeeny 2010; Ochoa Gautier 2006). This discussion contributes to this dissertation's aim of revealing the vibrant and agentic impact of nonhuman matter in the performance and experience of sound. These first two goals feed into the third: to provide the basic background analysis for chapter 5, which will return to the subject of jazz, exposing how the technoscientific regimes discussed in this chapter articulate jazz, and its sound, into the politics of race and gender.

This chapter represents a pivot point in this dissertation—and a momentary step back from some of the major concepts I've been considering so far. I barely touch upon jazz or its sound—and I do not seriously discuss race, gender, or any other of the key political/cultural problematics that motivate this study. Instead, these pages dig deep into the technology, its associated practices, and the scientific frameworks that undergird it—exploring how certain technoscientific modes of thinking and doing reveal a distinctive ontology of sound and space. This exploration will require a close analysis of materials seldom discussed in music scholarship.

This chapter's findings stand on their own merit, but let me take a moment to situate them within the broader argumentation of this dissertation. The preceding chapters have all participated in a broader argument that articulates the sound of jazz, and the ways it is manipulated through various sound technologies, with certain pillars of western modernity, which can be loosely distinguished into two axes: western "art world" aesthetics and technoscience. So far, the argument has leaned toward the former, showing how room acoustics, acoustical isolation, and "high-fidelity" sound reinforcement share distinct—though never uncomplicated—intersections with western classical aesthetics. While I have also highlighted

technology throughout, the current chapter leans more acutely into the realm of the technoscientific. Because of the complexities of the materials involved, and my aim to provide a close accounting of the material artifacts and practices at play, I must briefly suspend my explorations of jazz, its sound, and its social implications.

But this chapter's close analysis of science and technology is in full service of my overarching arguments about jazz and performance, which will return in full force in chapter 5. In that chapter, I will explore how the philosophies and practices of technoscience described in this chapter articulate jazz and its sound in regimes of western modernity, colorblindness, and whiteness. That argument requires that I first lay out in detail precisely how the technology is implemented. Moreover, while my ethnographic observations move outside the physical space of Jazz at Lincoln Center, the sonic principles discussed here are the bedrock of the electroacoustic architecture in JALC's performance spaces. Indeed, all of the sound systems at JALC were designed with the exact same principles, methods, and technological systems discussed in this chapter—and by some of the same people. Thus, to understand the sound of jazz at JALC—and many other places that share the scientific approach discussed here—we must understand the ontology of sound as conjured by Meyer Sound.

Meyer Sound and its adherents are outspoken in their embrace of science as a mode of knowing and doing. They specialize in especially complex, high-end sound systems, consisting of many loudspeakers controlled by sophisticated digital processors. As I discuss below, they codify their philosophy with a rhetorical boundary they call the “Arts/Sciences Line,” which they use to distinguish their work and philosophy as *scientific*, in contrast to other methods they classify as subjective and unscientific—but also *creative* and *artistic*. Though they embrace the discourse of science as a form of “boundary work” (Gieryn 1999) by which they distinguish

themselves from “non-scientific” companies and communities, they maintain unhesitant esteem for the creative side of live musical performance.

The primary technological artifact in this chapter is the SIM (“Signal Independent Measurement”) analyzer, a hardware-software measurement apparatus based around an approach to dual-channel Fast Fourier Transform analysis developed by John Meyer, Bob McCarthy, and a couple other Meyer technicians in the early 1980s. When it was released, SIM provided unprecedented ways to visually render aspects of live sound that were previously inaccessible. Importantly, I discuss how this technology has been used to develop the practice of *sound systems design and optimization*: the design of complicated sound systems and the “tuning” (optimization) of those sound systems as they are installed in real, physical spaces.¹ Ideally, the tuning process uses the SIM analyzer as a guide to creating a spatially uniform, tonally neutral “blank canvas” for artistic people to work with.

In other words, my interlocutors aim at keeping sound reinforcement in the *background*, unnoticed—“making the loudspeaker disappear,” as one of my interlocutors stated” (J. Monitto, pers. comm., July 8, 2017). In this chapter, I describe the epistemological, technological, and practical work involved in sustaining the very idea of a “transparent” sound reinforcement system that recedes from perception. I also show how, even if it remains entirely unnoticed to audiences, the sonic environments conjured by these systems are more than neutral containers

¹ Sometimes, calibration and optimization are considered two separate steps in the overall tuning process. At other times, calibration is considered a subset of optimization. Very occasionally, tuning is referred to as a process *after* optimization (or optimization/calibration). In such cases tuning implies making subjective tweaks to an already-optimized/calibrated system. At least one interlocutor called this subjective portion “voicing the system” (M. Ramirez, pers. comm.). But, most often, tuning is the general term for the entire process, with an emphasis on the “objective” parts. I generally use “tuning” in this last sense, while distinguishing the subjective tweaks when necessary.

waiting to be filled with the ontologically foregrounded sounds-as-objects² such as music or speech. Instead, sound systems, and the way they are designed and tuned, comprise a thriving, contested, and vibrant assemblage of matter and ideas that demands new ways of thinking about “live” sound, “liveness,” and the sonic mediation of space.

Still, while my main findings complicate ideas of scientific objectivity and abstraction, I maintain that the Meyer Sound commitment to controlling space through sound and technology is no mere fantasy. Indeed, even if my ethnography ultimately reveals that such ideals require recalibration, the methods of shaping sonic experience covered in this chapter are remarkably effective at controlling space through sound. As I will discuss in chapter 5, such modes of sonic control enroll scientific ideas, methods, and instruments in the creation of particular kinds of sonic spaces conducive to capital, power, and social inequality. But before proceeding to such conversations, I first need to lay out how this brand of technoscientific practice is actually carried out.

4.2. From Black Magic to Black Boxes: On the Arts and Sciences of Sound

Sonic accuracy has never been an important goal for manufacturers and users of audio technology (see also Sterne 2012, 201; Devine 2013). Sound reinforcement for live music, much like sound reproduction technologies such as phonography or radio, has been predominantly oriented around the goal of “good sound,” subjectively judged by human listeners. For live sound, the most notable exception is Meyer Sound Laboratories, which in the 1970s started advocating for “linear” sound reinforcement: that is, loudspeaker systems that would reproduce, evenly and without enhancement or coloration, precisely the same sonic signal as its input.

² On sounds as objects, see Rodgers (2011); Born (2018).

Company founder John Meyer and the epistemic community he has fostered have approached such goals by enrolling the authority and methods of science. And they have done so not only as a matter of epistemological and methodological principle, but also as a way to distinguish themselves from other companies and communities.

4.2.1. The Art/Science Line

The most striking representation of Meyer Sound's desire to use ideas drawn from science to perform boundary work is a rhetorical trope they call the "art/science" line. Though at its core the line is mostly metaphorical, it actively structures much of how Meyer people define what they do (and don't do) and how they relate themselves to other communities' ways of thinking about sound. I discuss the art/science line as a promiscuous kind of boundary work that threads through a range of binary oppositions important to how this community defines itself, its ideas, and its work. Among others, these oppositions include past/present; subjective/objective; creative/calculative; artistic/scientific. The art/science line also distinguishes Meyer Sound from "other brands" (M. Reich, pers. comm., July 14, 2018): clients buy and rent Meyer machines, and espouse their methods, largely because of their "scientific approach" ("Meyer Sound: Company Philosophy" 2015).

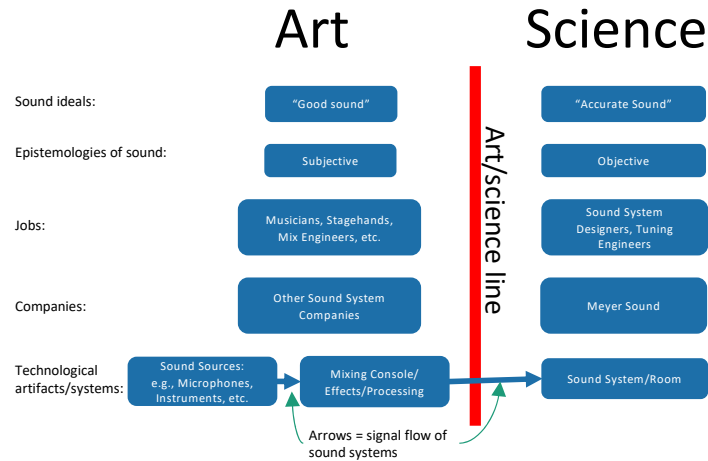


Figure 4.1: Meyer Sound's "art/science line," which is deployed to distinguish sound ideals, epistemologies of sound, jobs, companies, and technological artifacts/systems

At its most fundamental, the art/science line posits a distinction between two general approaches to thinking about sound and audio. The "science" side approaches sound reinforcement as "an objective pursuit," using "prediction tools [and] analysis tools" to provide "uniform response" in an "objectively verifiable" way (McCarthy 2010). Space and sound are objectified as controllable, measurable quantities that can be manipulated with clinical precision using replicable methods that take subjective human judgments out of the equation. The "arts" side is rooted in more subjective concerns—on what sounds "good."

My interlocutors often map the distinction between art and science to a corresponding historical distinction between a kind of primitive, nonscientific "then" and a more enlightened, science-based "now." For example, José Gaudin, system designer and head of optimization for the Montreux Jazz Festival, told me an oft-repeated story about how John Meyer decided to take a scientific approach to live sound reinforcement after some negative experiences as a patron at concerts:

You have to think back, it was the 1970s. So loudspeakers weren't efficient. It was all black magic. Sound was black magic at the time. Not music-wise, but sound—sound *reinforcement* was black magic. You had the guru. You had someone who "*knew how to do it.*" He had a—method. [But] the method was working only on [certain] type of rooms

or working on the outside, you know.... The technology, the culture, the education wasn't as spread as it is now. Now it's very very...spread.... It wasn't at the time. (J. Gaudin, pers. comm., July 8, 2017)³

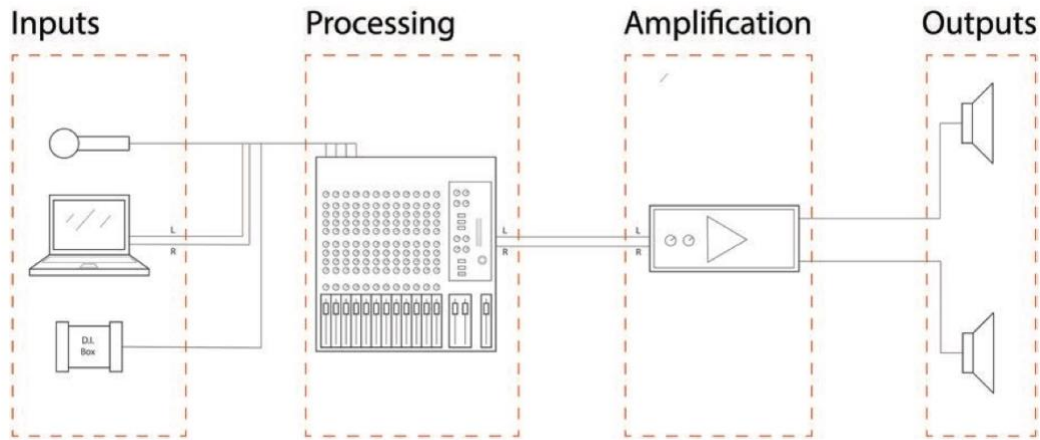
Though there are still plenty of people engaging in what Gaudin would classify the “black magic” approach, there is something different about “now,” when we have the technology, education, culture, and proper tools to “objectively” recover from a time when a “guru” would claim to hold the truth on how to optimize a room but wouldn't be able to explain it rationally or make it work in various places.

The art/science binary is also materialized in technological artifacts and systems themselves. In terms of signal flow, the line is located at the output of the mixing console, which also serves as the input of the sound system—at least how Meyer Sound considers the sound system. Here's Bob McCarthy, describing how an audio signal flows through a sound system:

The signal flows serially through three distinct sections: the source, the signal-processing and the speaker system in the room, finally arriving at the listener.... [T]he operation of the mix console falls exclusively into the scope of the mix engineer. The transition point out of the artistic sphere occurs at the console outputs. This is the handoff point for the source and we are charged with taking delivery.... [W]e will consider the signal to have passed over the “Art/ Science” line. (McCarthy 2009, 433–34)

The crux of this statement—that the line between the arts and the sciences can be found at a particular spatial/material/technological locus—needs some unpacking. For it entails an ontology of the sound system that excludes many things that most people consider central to the idea of a sound system.

³ I also heard similar versions from Bob McCarthy and Martin Reich (pers. comm.). John Meyer alluded to the same ideas, though he did not refer to specific concerts (pers. comm.). Though he has referred specifically to certain concerts in published interviews. This idea of a historical distinction between the primitive years and the enlightened ones is reproduced in many places, from Bob McCarthy's influential book (2016) to Emily Thompson's (2002) important history of science take on the field of architectural acoustics. Another example is found in Josh Loar's (2019) textbook on sound systems, which describes the advent of room optimization with FFT analyzers as a transition from “the Neanderthal age (‘make it fucking loud!’) to the present (‘make it loud, but also clean and clear and articulate!’)” (273).



"The Four Standard Elements" of a Sound System, from Loar (2019)

Figure 4.2: The standard way to conceptualize a sound system: including inputs, mixing console, amplification, and outputs/speakers. Note how "processing" is included in the mixing console element. From Loar (2019).

For example, the standard (non-Meyer) way to conceptualize a sound system is found in Figure 4.2, which delineates “four standard elements” through which signals flow left to right :

(1) audio sound sources like microphones, audio players, and other inputs, which feed (2) a mixing console, which combines and conditions these sound signals then sends this “mix” on to (3) amplifiers and ultimately (4) loudspeakers (Loar 2019). There are plenty of variations of this general template—some that merge these elements into fewer boxes, some that add considerably more—but the basic arrangement is standard. It is a sensible model, especially for smaller systems in which the mixer and amplifiers (and sometimes the speakers, too) may be situated in the same physical enclosure. This model also makes intuitive sense: every bit of technology that in some way intersects electronic transductions of mechanical waves is included in the system.

The Meyer Sound Model of a Sound System

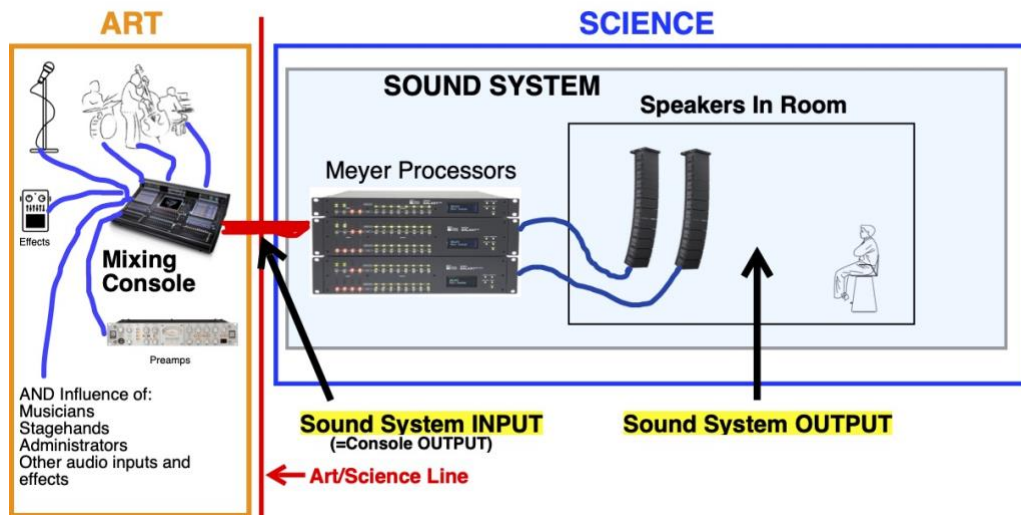


Figure 4.3: The Meyer Sound concept of a sound system and the art/science line

Unlike the standard model, the Meyer Sound framework detaches everything “upstream” of the console output and deems it exterior to the system—and thus exterior to the domain of science (see Figure 4.3). This includes the mixing console and everything feeding into it—microphones, instrument signals, effects, and so forth. All these sound sources and signals (among others), as well as the creative decisions and actions of all sorts of individuals (where stagehands put mics, what mics are selected, what effects are used), are fixed in the domain of art (the orange box) and excluded from the sound system.

In the Meyer Sound model, the sound system is in the domain of science (the blue box in Figure 4.3). The main components are (1) Meyer-branded signal processing, (2) Meyer loudspeakers (with amplifiers built in⁴), and, importantly, (3) the room. The processors can be

⁴ Meyer Sound is well-known for its advocacy of the powered approach, and it is crucial to their technological philosophy. Among other things, combining amplifiers with speakers allows for both to be matched to each other, thus doing away with a major potential source of non-linearity. As home hi-fi enthusiasts know, the pairing of amplifiers and speakers is more than the sum of the two. Drawbacks are expense and some added weight in the speaker cabinet itself (though, overall, they are lighter because they don’t require outboard amplifiers, which usually push the aggregate system weight higher than an active package).


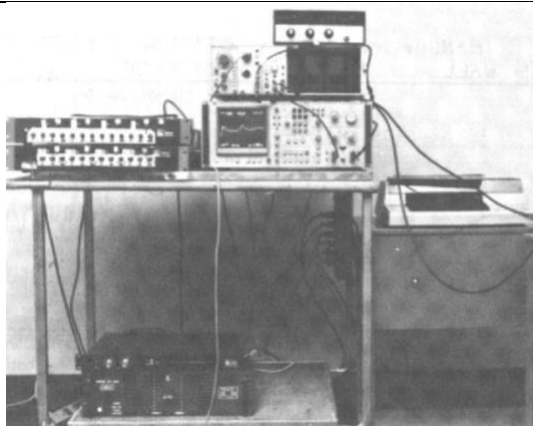

imagined as very fast and high-resolution digital “mixers of mixes” that send signals to many different speakers and speaker groups, each with independently controllable filters like gain (output level), time delay, equalization (EQ), and many more exotic effects. It is in these boxes (controlled by a laptop or tablet) where much of the “tuning” is effectuated: time delays are placed on certain speakers or groups; where levels are adjusted and equalization, all-pass filters, and any number of other subtle and not-so-subtle alterations are applied. Importantly, the final element of the system, the speaker/room composite, includes not only the permanent architectural structures that compose the room, but also any physical bodies, human or nonhuman, that occupy it.⁵

To maintain a sense of scientific coherence, the Meyer model attempts to fix clear physical and epistemological boundaries on where the system starts and where it ends. Most important, the Meyer model cuts out the array of potential audio inputs that are included in the standard model (microphones, media players, etc.). Instead, a Meyer system has only one input: where the output of the mixing console feeds analog audio into Meyer processors. This interchange is both the start of the sound system and the boundary between between art and science.⁶ As indicated above, the output of the system, where the reproduced sound is meant to transparently match the “original” source provided by the console, is not found at the speakers themselves but in the assemblage comprised of the speakers, the physical room, and any human

⁵ Note that the seated patron pictured in the figure is not included in their role as a listener, which is not necessarily a part of the system, as certainly would be the case in a social/technological relation of fidelity as discussed in chapter three. Rather, the human body is included here purely for its capacity to affect the transmission and reflection of mechanical waves.

⁶ The room/speaker system doesn’t have to be located in the same physical space as the processors or even the mixing console. At JALC, for instance, the Meyer processors are located in the basement. I also note that this “output” of the system is significantly more complex than the single input

bodies or other materials that reflect or absorb mechanical waves. In experimental science, it is a foundational principle that the boundless physical world may be circumscribed into a narrower, coherently definable object of study, one abstracted into a smaller set of clearly observable variables.⁷ Similarly, the Meyer approach isolates a subset of a more sprawling social-technological network so that it may subject it to quantitative abstraction, measurement, and control. Here, even human bodies are enrolled as part of the “experiment”—incorporated into the rationalized theater of measurability, objectified into the domain of science.

		
<p><i>Figure 4.4a: Bob McCarthy with the original SIM prototype (lower right) in 1984. Photo from McCarthy (2016)</i></p>	<p><i>Figure 4.4b: Picture of the original SIM in laboratory environment, from a scientific paper by John Meyer (1984).</i></p>	<p><i>Figure 4.4c: Bob McCarthy fixing an uncooperative SIM III, February 15, 2019, Brooklyn, NY. Photo by Tom Wetmore.</i></p>

4.2.2. An “X-Ray Machine” for Sound: The SIM Analyzer

A central mediator of the art/science line is Meyer Sound’s audio analyzer, called SIM, an acronym for “Signal Independent Measurement.” At its core, SIM uses Fast Fourier Transform analysis (about which more below) to process audio data in the time domain—that is,

⁷ As Stephen Jay Gould states, “Reduction of confusing variables is the primary desideratum in all experiments. We bring all the buzzing and blooming confusion of the external world into our laboratories and, holding all else constant in our artificial simplicity, try to vary just one potential factor at a time” (Gould 1996, 367).

mechanical vibrations represented in electronic form (amplitude versus time)—and convert it to frequency, phase, and other domains.⁸ SIM displays this data visually as line graphs, allowing technicians to visualize certain aspects of sound that had never been easily quantifiable before (Figure 4.5). One of my interlocutors referred to the SIM as an “x-ray machine for sound” (M. Ramirez, pers. comm., June 27, 2018).⁹ The original SIM was officially put to market in 1986, though Meyer technicians (most notably John Meyer and Bob McCarthy) had been experimenting with prototypes since the early 1980s.¹⁰ Though FFT analyzers had existed since the 1960s,¹¹ no one had developed a way to make use of it in a live sound scenario until the early 1980s, when John Meyer got together with Bob McCarthy (McCarthy 2016).¹²

⁸ The key advances that the SIM provided over previous technologies (namely, the RTA analyzer, which is still in use today but, according to my interlocutors isn’t useful for much) included the use of Fast Fourier Transform (FFT) analysis, which could provide graphic measurements of not only sound level versus frequency spectrum, which RTA analyzers could already do (with much less precision and in subtly misleading ways), but simultaneous measurement of phase and delay, which RTA analysis can definitively not do.

⁹ Though many of the citations in this section include interviews of and writings by people associated with Meyer Sound, I have rigorously checked with unconnected, or even competing, sources to help account for any bias. Sam Berkow, for instance, the creator of SMAART, which is the strongest competitor for Meyer’s SIM analyzer, in his oral history interview for NAMM (Berkow 2011), cited John Meyer specifically as a formative influence that came before his work. Incidentally, Berkow was also the architectural acoustician who took the lead on designing acoustics of the Appel Room o JALC. Also note that amongst the team cited as creating SMAART alongside Berkow (Don Pearson, David Griesinger, and Alexander Yuill-Thornton), two out of three had previously worked with Meyer Sound on the SIM project (McCarthy 2016, 2020).

¹⁰ John Meyer was experimenting with single-channel FFT analyzers in the early 1970s (J. Meyer, pers. comm.).

¹¹ The mostly widely used FFT algorithm (there are now a handful) was released in a paper by Cooley and Tukey in 1965, and a handful of computer manufacturers were quick to implement it. Hewlett Packard was one of the first, and it was certainly the most widespread in the 1960s and 1970s. Hewlett Packard analyzers were at the core of the early SIM prototypes, which basically consisted of a Hewlett Packard FFT box (reprogrammed by Bob McCarthy), a delay unit, and a parametric EQ designed and hardwired by McCarthy. Specifically, they used an HP 3582A dual channel FFT box. See Figure 4.4.

¹² FFT analyzers, notably, were *not* created for audio analysis in particular. They have had far more industrial applications. This includes virtually any field in which data is collected in a time domain and would benefit from expression in terms of frequency. Which means, basically, anything that involves vibration or oscillation, from thermodynamics to car engines to radios—and much more. Catering existing FFT boxes to audio analysis was not straightforward. Simply getting them to display an amplitude versus frequency graph over the human audible range in a sensible way, especially considering the logarithmic nature of human hearing, had to be customized in the

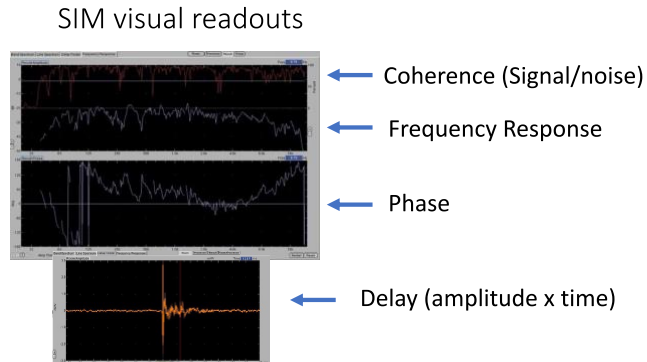


Figure 4.5: SIM visual readouts

The way SIM uses *dual-channel* FFT analysis is perhaps the most important innovation. With only one channel of analysis, an FFT analyzer can analyze an audio signal (say, from a measurement microphone) and visualize it in line graphs. But while this is a major accomplishment, it is only useful for a limited range of signal types. For example, imagine played a recording of my voice through a sound system like the one depicted in Figure 4.3, and a measurement microphone captured a signal of it in the room. A single-channel FFT analyzer could provide a visualization of the audio signal captured by the microphone as a line graph—which would certainly not be “flat”—but it would tell me nothing about how accurately the system reproduced the input signal. Why? Because I have no idea what an accurate analysis of my voice *should* look like. Hence, I wouldn’t be able to tell the difference between a visualization of an accurate reproduction and a distorted one.

machine’s computer code. This was a painstaking and virtuosic task. A good introduction to these concepts and this history is Bob McCarthy’s online demonstration, “The Evolution of System Optimization” (2020), available at <https://youtu.be/Uk9Ogz76glk>.

Thus, a major limitation of the single-channel FFT analyzer is that it requires known “excitation signals” (Meyer 1984) such as pink noise¹³ to serve as a baseline, so that we might visually detect discrepancies in the analyzer visualization. Put simply, if the final measurement looks like the test signal, the system is good; if it doesn’t, any deviation indicates non-linearity. And with “known” signals like pink noise—which appears visually flat on a (logarithmic) frequency response graph—the deviations should be easy to see. Such a process is fine for laboratory measurements, but it is not ideal for live music. As John Meyer stated in a 1984 paper, since such test signals “can be annoying,” it was “not possible to...gather data unobtrusively in the presence of an audience.” Hence, until the advent of Meyer’s novel approach, “information about the effect of audiences on the acoustics of spaces [was] scarce” (Meyer 1984, 2). This is a non-trivial point since the presence of an audience can drastically change the sound of a room, most notably through changes in the room’s absorptive characteristics and the air’s environmental conditions (Beranek 2004, 501).¹⁴

¹³ Pink noise is a common test signal that sounds a lot like the more famous “white noise” (which randomly produces sound at the same amplitude at all levels), but with a linearly descending amplitude as frequency increases. That is, with frequency plotted on a logarithmic scale.

¹⁴ A technical aside: one of the great difficulties was not the mathematical calculations necessary to perform this function, but in synchronizing the timing between the two signals. Because of the nature of electronics and acoustic transmission, some signals take longer to reach their destination than others, especially those signals that have to take a longer physical path, undergo more transductions, or have more digital processing. If an analyzer is fed one signal from a signal generator close to the analyzer box and one signal from a microphone that’s picking up the same signal after it goes through sequence of transductions (including transmission through air, which is much slower than traveling through electronics), the signal from the signal generator will arrive significantly earlier than the signal from the microphone. Comparing these two out-of-sync signals would be useless (in technical lingo transfer function math only works when the two signals are *correlated*), so the Meyer team developed a proprietary analog delay device that could synchronize the signals by adding delay to one of the signals to match the other (M. Ramirez, pers. comm.; McCarthy 2020).

Sound System with SIM Measurement

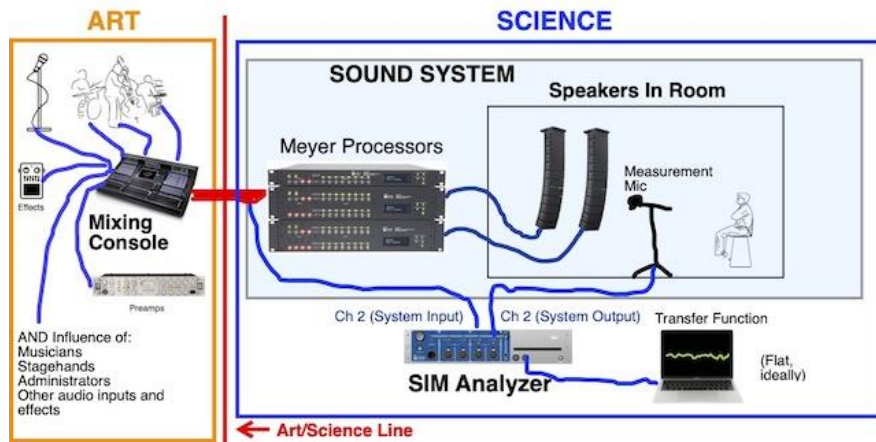


Figure 4.6: SIM measurement of Meyer Sound system

SIM solves such problems by measuring two signals instead of one. These measurement signals can be taken from any points in the signal chain, depending on what aspects one wishes to test. The most important arrangement is to measure the input and output of the system, as defined in the preceding discussion (see Figure 4.6). Using dual-channel FFT analysis, the SIM calculates the *difference* between the two signals—what is known as the *transfer function*. This isolates precisely any changes the system might introduce, regardless of what the original sound is (i.e., the input signal doesn't have to be pink noise or any other “annoying” test signal). Only the *difference* between the two signals matters; not what they actually look like.

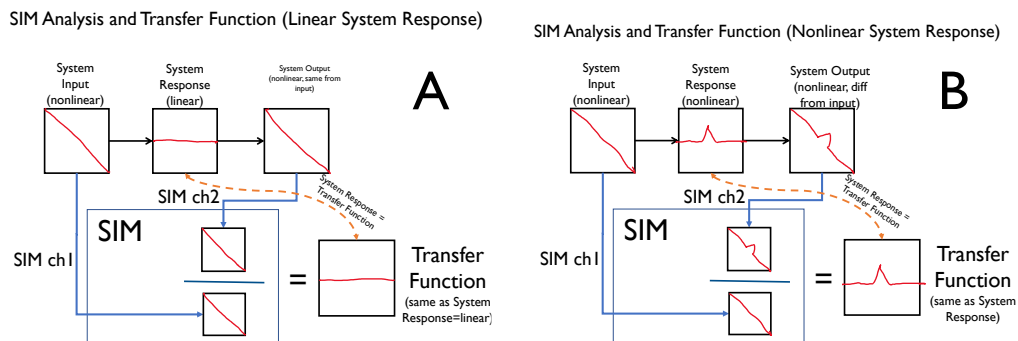


Figure 4.7: Transfer function examples

For instance, Figure 4.7a shows how a non-flat signal enters a flat system, which ultimately outputs an identical non-flat signal (a flat reproduction of a non-flat signal); the transfer function is thus flat, because it calculates the difference between the two identically non-flat signals. This means that the transfer function correctly measured the system response to be flat even though the actual signals were not flat (usually so). Figure 4.7b shows a non-flat test signal passing through a non-flat system to ultimately reproduce a non-flat test signal *different than* the input. The resulting transfer function shows a graph identical to the non-flat system response, with no relation to input signal. In both examples, the transfer function shows the response of the system itself, no matter what the input or output signals look like. Because the input signal no longer mattered, music could be used, which meant tests could go one with audience present—and even during a performance (using the live music itself as a test signal).

Audiences could thus be incorporated into the test itself, allowing SIM techs to measure the combined acoustic effect of their bodies on the system’s response. The system could even be tuned mid-performance to accommodate any such changes.¹⁵ Human beings themselves are thus incorporated into the whole “scientific approach,” the acoustic influence of their bodies quantified and codified into visual changes on a screen. They become part of “the system,”

¹⁵ For example, if the audience “warms up” the room (D. Gibson, pers. comm), the SIM can detect this without playing any “annoying” test signals and an engineer can compensate by changing the equalization of the system. Note that, during my fieldwork, none of my interlocutors actually measured and tuned a room mid-show. The room tunings I observed, whether at JALC, MJF, or a number of smaller venues, was all done behind the scenes, with no audience. I did, however, see a handful of visiting engineers at Stravinski Auditorium at MJF doing some tweaks mid-performance. Big-name international touring often tour with such “systems techs,” as they’re called. They usually use SIM’s competitor Smaart, a flexible, powerful, and far less expensive software package that users can run on their own laptops (SIM is a dedicated hardware/software box). I refer to Smaart again below, in my ethnographic narrative.

inside the “science” domain of the art/science line—like the solitary listener I pictured in Figure 4.6.

I propose the SIM machine to be at both the technological and philosophical center of Meyer Sound’s whole approach to sound. The machine is critical for the very definition of the sound system as a network of materials with a defined input and output. The dual-channel nature of SIM is key here. The moment we can imagine sending one signal to SIM as input and one signal to SIM as output is the same moment we can ponder a system as a self-contained and coherent object of scrutiny and manipulation. The machine gives intelligibility to the idea that a system can begin at a cable coming out of a mixing console and end in a complex room/speaker assemblage.

Referring back to Figure 4.6, we see how the SIM machine connects the most important aspects of the Meyer Sound philosophy: it links the art/science line, speakers, processing, and even the human bodies in the room/speaker system. Importantly, in Figure 4.6 the SIM machine is pictured as outside the sound system (but within the domain of science (the blue box). Like a microscope looking at a petri dish, the SIM machine and its visual readout stand external to the relation of mediation while constructing the sound system as an object of contemplation and observation. Similarly, SIM articulates and reinforces the art/science line while firmly establishing the credentials of Meyer loudspeakers and systems through quantitative data and scientific authority.

4.3. “The Battle for Spatial Uniformity”: Tuning the Room

Room tuning requires a significant investment of time and effort, most of which takes place well before any artists or mix engineers arrive. Bob McCarthy explains:

Tuning is about making the far seats similar to the near seats. An objectively verifiable—but verifiably unattainable goal of same level, same frequency response, same

intelligibility throughout the room. Making the under-balcony as similar as possible to the mix position (which hopefully is NOT under the balcony). It is about making sure every driver [loudspeaker] is wired correctly, still alive, aimed at the right place and cleanly crossed over to the next one [a smooth transition between overlapping speakers].

The most overarching principle in delivering “artistic decisions as accurately as possible” (J. Monitto, pers. comm., July 8, 2017) comes down to what Bob McCarthy (McCarthy 2016, xv) calls a “battle for spatial uniformity.”¹⁶ The central distinction here is that rather than making the sound tuned only from the front of house (FOH) mix position, where the mix engineer is located (usually somewhere near the center of the floor), the sound should now be the same *everywhere*.¹⁷



Figure 4.8: Typical scenes from room tunings, emphasizing the visual (pictured: Bob McCarthy, Mauricio Ramirez, José Gaudin). All photos by Tom Wetmore

¹⁶ This sentiment echoed in numerous interviews with people like Martin Reich, Mauricio Ramirez, and others.

¹⁷ Before the advent of modern analyzers that could take multiple measurements from a microphone placed at *distinct locations* in a room—and *save them* digitally so data from different locations could be compared—all tuning, done mostly by ear, would usually take place only at the mix position (McCarthy 2016, viii).

Sam Berkow describes optimization as “a process that should be guided by structured listening and critical listening” (in McCarthy 2016, 13), which is true. But my observations show that by far the bulk of the time is spent looking at graphs, mathematically calculating phase times, and looking to see if computer traces (graphs) match up (see Figure 4.8 for typical scenes of conspicuous viewing). This process of matching up aspects of sound takes place along three analytic dimensions: (1) time, (2) frequency response, and (3) level. The primary goals of tuning in the time dimension are to make the sound waves from different speakers arrive at the listener (or any particular point in space) at the same time, and with as little negative phase effects as possible. Speakers must be “timed” to each other—usually by adding tiny delays to one or more of them (on the order of milliseconds)—in any situation in which they not located at the exact same distance from the point in space where the tuning takes place. Otherwise, sounds from closer speakers will arrive earlier than more distant speakers, causing a range of intelligibility issues and undesired phase interactions between the overlapping waves. Unfortunately, it is physically impossible to time all speakers at all points in space (or at all frequencies), so a compromise is necessary. Technicians have developed a range of mathematically rigorous ways to optimize such compromises.

Tuning frequency and level are likely more intuitive to most people. Tuning in the frequency dimension concerns the relative balance of sound levels across the frequency spectrum, and it is done principally through the manipulation of equalization (EQ).¹⁸ Applying EQ adjustment is analogous to the “tone” settings on a variety of consumer audio devices

¹⁸ In the old days, to “EQ” a room was pretty much the beginning and the end of what “tuning” a room meant. Increasing the “lows,” or the low frequencies (around 125 Hz), is said to increase the “warmth”; increasing the “highs” or “mid-highs” is said to increase the “brightness” or “crispiness” (Beranek 2004, 30; M. Ramirez, pers. comm.).

(home/car stereos, smart phones, etc.), though the primary aim in the Meyer sonic epistemology is for a neutral, “toneless” frequency response. Tuning level basically means that most spaces in a room have equal loudness, and that there are smooth transitions between the coverage areas of different speakers and groups.¹⁹

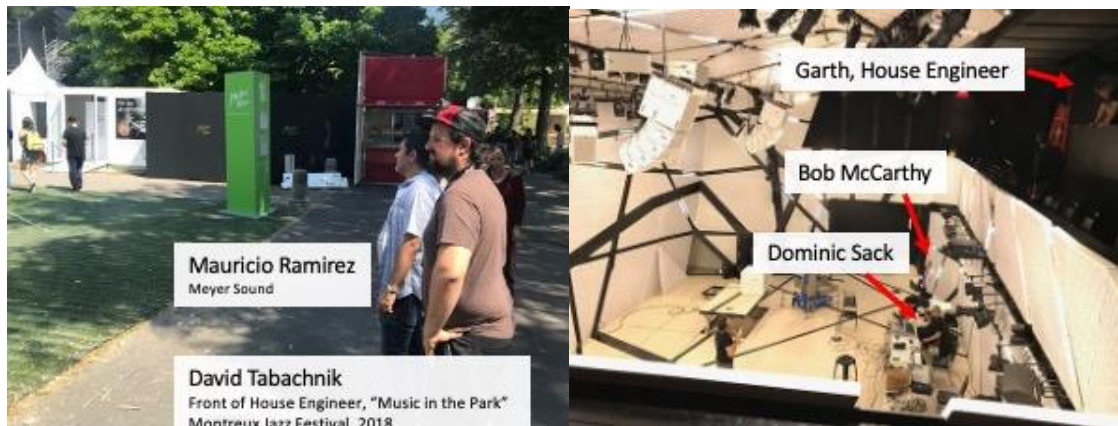


Figure 4.9: "Voicing" the system after optimization
Left: *Mauricio Ramirez (Meyer optimization engineer) and David Tabachnik (front of house mixer, "Music in the Park," Montreux Jazz Festival), at the Montreux Jazz Festival.* Right: *Bob McCarthy (Meyer Sound), Dominic Sack (CEO, Sound Associates, at desk), Garth (Front of House Engineer, above), at National Sawdust, Brooklyn, NY. Photos by Tom Wetmore.*

Uniformly matching the three axes of sonic measurement across space is what Martin Reich, the Montreux Jazz Festival Sound Coordinator, describes as “first setting the system physically correct”—to “exclude all the mistakes [and] make the system physically perfect.” With this painstaking work done, engineers can make global adjustments to the whole system that will apply evenly across all the speaker groups and locations throughout of the room. Mauricio Ramirez, an experienced Meyer technician, calls this last step “voicing,” and it customarily involves consultation with the house mixing engineer(s) (pers. comm., M. Ramirez, June 27, 2018). These final modifications, in Reich’s words, slightly shift the system from being

¹⁹ Though loudness is a perceptual quality and not a physical one, and though loudness and “level” or “amplitude” have important technical distinctions, I will equate these concepts when the distinctions are not salient, and the conflation will make my writing more narrative. Technicians do the same thing regularly.

“physically perfect” to having “an acoustical signature.”²⁰ This last step flirts with the art/science boundary because it is here that subjective desires can be, and usually are, accommodated.

4.4. Microphones, Machines, and Moving: Tuning as Contested Assemblages

I now introduce ethnographic observations from the many sound system tunings I participated in during my fieldwork. My goal is to give a sense of how much more complicated and contested it is to apply Meyer’s methods and technologies in “in the field” (my interlocutors’ term) than to conceptualize them in the abstract. Though I observed about fifteen tunings over a period of about two years, the majority of took place in the week preceding the 2018 edition of the Montreux Jazz Festival (MJF) in Montreux, Switzerland. MJF was an ideal site because there are many venues (about 15, depending on how one defines “venue”), and they all have newly designed sound systems installed every year. All the systems are provided by Meyer Sound, which has sponsored the festival for over thirty years.²¹

²⁰ It is possible for a mix engineer or other stagehand to make such adjustments without consulting Meyer technicians. David Gibson does this at Rose Theater at JALC from time to time. But this is not common, and Meyer technicians tend to discourage it. The intention is for Meyer technicians to set up the system as a permanent installation, not as an “instrument” to be tinkered with by mix engineers during a show. It is the blank canvas. One of the advantages of the whole “art/science line” theory is that, since the sound system is segregated from the mixing console, the mix engineer can simply make top-level adjustments from the console itself which will filter through all the speakers in the house without any need to think about the processing and routing that takes place after the signals leave the desk. The “black box” of the system is thus meant to make the manipulations at the mixing console all the more powerful, because they will be reproduced accurately in the whole room.

²¹ The relationship grew from a person relationship between the festival’s founder, Claude Nobs, and John and Helen Meyer. As I discussed in chapter 3, in the 1970s, John Meyer had led a research program in Montreux, studying acoustics and sound reinforcement for classical music. It was then they developed their relationship with Nobs. As the story goes, not long after the Meyers returned to the US and founded Meyer Sound, Nobs reached out to the Meyers for help improving the sound reinforcement at the festival (J. Meyer, pers. comm., April 26, 2019; H. Meyer, pers. comm., April 26, 2019; J. Monitto, pers. comm., July 8, 2017; M. Reich, pers. comm., July 14, 2018). I got whispers of some strain in Meyer Sound’s relationship with the festival in recent years, which likely relates to Nob’s passing in 2013. Ramirez told me that in recent years the festival has stopped the customary practice of providing Meyer Sound with amenities like all-access wristbands, hotel rooms, and so forth, which are common for major sponsors. Meyer still provides these things to their VIPs—including wristbands for at least one grateful ethnographer—but the company has to pay for them. My wristbands, I should note, were available to me on a day-

I originally gained access to the behind-the-scenes sound crews in 2017 through John Monitto, Meyer Sound’s Director of Business Development. I met and became friendly with him at JALC, and upon my arrival MJF the first time in 2017, he provided me introductions and daily wrist bands that gave me backstage access and admission to any performance. I independently met MJF Sound Coordinator Martin Reich, who was also an important interlocutor.

By far my most important connection was with José Gaudin, who not only designs all the systems every year (and tunes most of them) but also serves as mix engineer at the one venue in the festival that consistently features jazz, the Montreux Jazz Club. He is thus the rare Meyer employee that works on both sides of the art/science line. José is a bit of a celebrity in the sound world. A former jet pilot (and mechanic) in the Swiss Air Force, he’s known for his virtuosic math skills. One Meyer employee speculated that José’s experience making “split-second decisions” flying jets explained his super-fast calculations (M. Van Veen, pers. comm., January 9, 2019). He is young (early thirties at most), especially for the immense responsibilities he has at MJF.²² Most important, from my perspective, he had the energy and patience to let me hang around with him day after day, from early morning to late at night.

On my return in 2018, I arranged to arrive the week before the festival started, the same day the first trucks arrived carrying sound gear. I watched and participated as a whole festival was literally “built.” José was my guide, introducing me to everyone, letting me follow him

to-day basis either when Meyer Sound had purchased too many or when one or more of their VIPs couldn’t make it. On the few occasions that a spare wristband was not available from Meyer Sound, the festival’s mixing console sponsor, DiGiCo, always had a spare.

²² Gaudin has no university education, which is incredibly rare for a Meyer Sound employee. It clearly doesn’t matter, though, because he is treated with respect and even awe by some of the most respected people in the company (Bob McCarthy, for instance, expressed this to me directly; so did Merlijn Van Veen and John Monitto). John Meyer is apparently a fan of José’s, not only because of José’s audio skills but also because he owns and works on his own helicopter—which is certainly a good way to get in the good graces of a quintessential “tinkerer” like Meyer (J. Gaudin, pers. comm., July 8, 2017).

around, explaining what he and the crews were doing, and even letting me help out with placing measurement microphones and other simple technical tasks. It was a dense and stimulating experience that yielded overwhelming amounts of data. In what follows, I limit the discussion to one tuning, at the festival’s premier stage: Stravinski Auditorium.



Figure 4.10: Plan view diagram of Stravinski Auditorium, showing some of the speakers and speaker groups (mains, flown subs), the stage, and the front of house (FOH) mixing position.

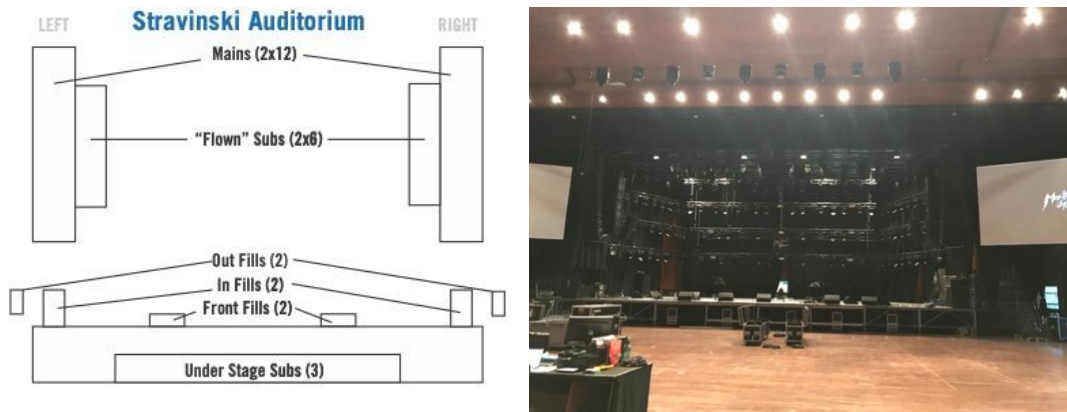


Figure 4.11: Stravinski Auditorium from the “front of house” (FOH) mixing position (the primary location of the main mixing engineer and console). This is also where José and Magú set up the SIM analyzer, the main processor controls, and where most of the time is spent in the tuning process. Photo by Tom Wetmore.

The MJF is mostly centered around the Montreux Music & Convention Centre, where Stravinski is the only permanent performance venue.²³ It is primarily considered concert hall for

²³ The convention center also has a space called Miles Davis Hall, which the MJF converts into a venue called Montreux Jazz Lab, which features almost exclusively electronic dance music (I never saw or saw listed any other kind of music). But this big, lumpy-shaped room is *not* a music hall at its core. It is an exhibition hall. And, like most other spaces in the convention center, it can be *built* into a music venue.

classical music, though it regularly serves other purposes. The rest of the center consists primarily of giant exhibition halls which can be partitioned into modular spaces by building walls and other structures. The Montreux Jazz Club, the one venue catering primarily to jazz, is historically one of these modular rooms, rebuilt every year in a new way.²⁴

Stravinski is the most prestigious and largest of the many stages at MJF. It fetches the highest ticket prices and books the most in-demand artists. As has become common for big-name international jazz festivals, this “main stage” rarely features jazz in any strict sense. In stark contrast to the JALC venues discussed earlier, not only is this room not designed for jazz, but there isn’t even any pretense that jazz should even be privileged there.²⁵ Or even played there.²⁶

²⁴ In 2018, they did something different: the Jazz Club was moved down the road to an independent structure. This was a break from many years of tradition. The new room was much bigger than usual (about 600 rather than less than 200), and as a result, there was a little less jazz and a little more popular music booked there. But it was still the site most dedicated to jazz.

²⁵ These days, the MJF is probably most remembered by jazz and non-jazz fans as a site of some famous concerts from Miles Davis’s electric phases, Michael Jackson, Led Zeppelin, Deep Purple, and others. Deep Purple’s famous song, “Smoke on the Water,” tells the story of a fire at Frank Zappa concert at the Montreux Casino, the original venue of the MJF (no longer in use). The casino, which is now rebuilt but is no longer part of the festival, which takes place mostly at the Montreux Convention Center (which includes the Stravinski Auditorium). In 2018, the moments of highest buzz revolved around the hard rock “supergroup” Hollywood Vampires, which gained a lot of buzz because one of its guitarists, the actor Johnny Depp, was in the headlines for some personal problems, and, the closing headliner, Jamiroquai. All this is to say that if one does not seek out the specifically “jazz”-oriented events (and there certainly are many), one can experience the whole two weeks of the festival without feeling much jazz influence at all.

²⁶ In 2018, when I attended every night of the festival (popping in and out of different venues), the closest to a “jazz” performance at Stravinski was Gilberto Gil or Trombone Shorty, for which claims of “jazz” status would be considered tenuous by most jazz observers. In 2017, Herbie Hancock played with an all-electric group. “Jazz” is almost exclusively limited to the Montreux Jazz Club, and to a much lesser extent, the outdoor “Concert in the Park” venue. In that venue, the jazz performed consists almost exclusively of university and secondary school big bands. The majority of the performances at this venue is popular music, mostly rock during the day and early evening, and a mixture of rock and various kinds of dance music until late in the evening (ending around 3 a.m.).

In the early 1970s, like many other jazz festivals, Montreux evolved into to include at least as much popular music as jazz.²⁷

I thus focus on Stravinski here not because of any relation to jazz, but for a range of other practical reasons. For one, because the system was the most complicated, it took the longest to install and tune, and it was thus easier to document. For example, I had ample opportunity to ask questions during the many hours when the tuning techs were simply waiting for the installation crews to put the system together. Also, because of the scale of the job, the room was tuned by two people instead of one: José, who designed the system and was the festival’s head of optimization, and Mauricio Ramirez, another well-known engineer in the Meyer world. Ramirez, or “Magú” as he insists on being called, made the trip to Montreux to tune some of the smaller venues and to assist Gaudin with anything he needed. Having two technicians provided at least two benefits for me: (1) they would be talking about what they were doing (and not just responding to my questions) and, (2) because neither shared their native language (Gaudin is French Swiss and Ramirez is Mexican), they spoke exclusively in English to each other.²⁸ In all

²⁷ Of course, big-name jazz artists do play Montreux, but they perform almost exclusively in the festival’s Jazz Club (that’s the name of the venue), the smallest of the three premier venues. In 2017, the first time I attended the festival, the Jazz Club was only around 200-seats, booking the kind of acts one would expect to find in a reputable venue in that size range size. Which is to say, “jazz” acts, the likes of which you’d find at a New York club like a Birdland, the Blue Note, and others—though with a slight slant toward European artists over US-Americans. In 2018, the Jazz Club was in an entirely different site—a converted ballroom seating around 600—and it was where I spent most of my evenings. José Gaudin was the mixing engineer. But even in that room, where I listened to quite a few jazz artists (by virtually any definition)—Chick Corea, Brad Mehldau, Robert Glasper, Avishai Cohen, and others—I encountered plenty of popular acts and singer-song writer performances (John Cale, Pomme, Selah Sue, etc.). There were also plenty of “borderline” cases (e.g., Roosevelt Collier, Cory Henry & the Funk Apostles, etc.). The other premier ticketed venue, the Montreux Jazz Lab, hosted exclusively electronic dance music, and though I became very friendly with the house engineer there, I only peeked in a few times to hear how the room sounded.

²⁸ Almost all of the technical folks, whether audio, video, or anything else, speak mostly English to each other—and certainly all the Americans, who I rarely heard speaking any other language. Local crews, like those from Skynight, the rental and installation house that did the heavy lifting, spoke mostly in French with each other, but some also spoke English. The only American I heard consistently speaking French was Ron Kurz, the “truck” mix engineer who handled the recorded mixes of all shows at the Jazz Club. Kurz worked in a portable recording studio and

the other tunings I participated at MJF, with either Gaudin or Ramirez, they were always happy to answer any questions I had (as Bob McCarthy and others were in the US), but I got a much better sense of how a tuning would naturally progress (without my interruptions) by observing discussions and decision-making in real time at Stravinski. (I still asked many questions when it wouldn't disturb the flow.) Lastly, both men unhesitatingly consented to have me document the entire thing. I thus kept one audio device recording the entire time, using a smart phone to capture videos while taking handwritten notes in a notebook and on my laptop. This afforded detailed documentation of the whole operation.

A full accounting of the whole tuning is impossible without dedicating an entire dissertation to it. But for the purposes of my analysis, it isn't necessary. In what follows, I focus on the granular details of just a few short episodes from a multi-day process in order to draw out with "thick description" (Geertz 1973) important cracks in the narrative of sound system design and optimization as "objective" and "neutral" processes. In contrast to the distanced perspective implied in the art/science model, a detailed ethnographic rendering reveals a constellation of unexpected and contradictory factors and forces, both human and non-human. I find a complex combination of visual representation, individual and collective listening, bodily movement through space, verbal and non-verbal communication, and mental and physical fatigue all play a role in shaping. Unlike the distanced purity of a schematic diagram, or discursive boundaries separating "arts" and "sciences," the lived process of tuning rooms reveals an excess of

created an entirely separate mix of the audio intended only for live stream viewers/listeners and for archival purposes. The term "truck" is commonly used to describe a recording studio that is separate from the live performance venue itself that is responsible for creating an independent mix of the same sound signals that the "front of house" engineer in the room mixes. Kurz did his work in a literal truck, but this isn't necessary. Almost all concerts at JALC are recorded, and many are livestreamed, in an incredibly well-outfitted pair of recording studio down the hallway from the main venues. The engineers working in those studios regularly refer to themselves as the "truck" mixers.

epistemological, technological, and political messiness that demands a recalibration of the “pure science” idea of sound reinforcement. I now turn to the examples.

4.5. Example 1: The Fills: On Microphones, Machines, and Moving



Figure 4.12: Mauricio Ramirez using SIM interface on Macbook Pro during tuning of Stravinski Auditorium, Montreux, Switzerland. He is positioned at the front-of-house mix position. Notice the SIM measurement microphone in the foreground. Photo by Tom Wetmore.

“This is something strange,” Magú muttered, peering at his Macbook Pro, perched upon a cabinet of rack-mounted audio gear. Magú was using the computer to interface with both the SIM analyzer and the digital processors distributing and conditioning all the audio signals throughout the system (Figure 4.12). It was around 11:30 p.m., and most of the “big” parts of the system seemed were already tuned to each other. All the speakers in the main array had been tuned to each other; the “flown” subwoofers suspended in the air were tuned to each other; these groupings (mains and flown subs) were tuned each other, as well as to another set of subs beneath the stage and a few additional speakers throughout the system. That is, all these speakers and groups were (1) time-aligned, (2) EQ-matched, and (3) level-matched across all the primary

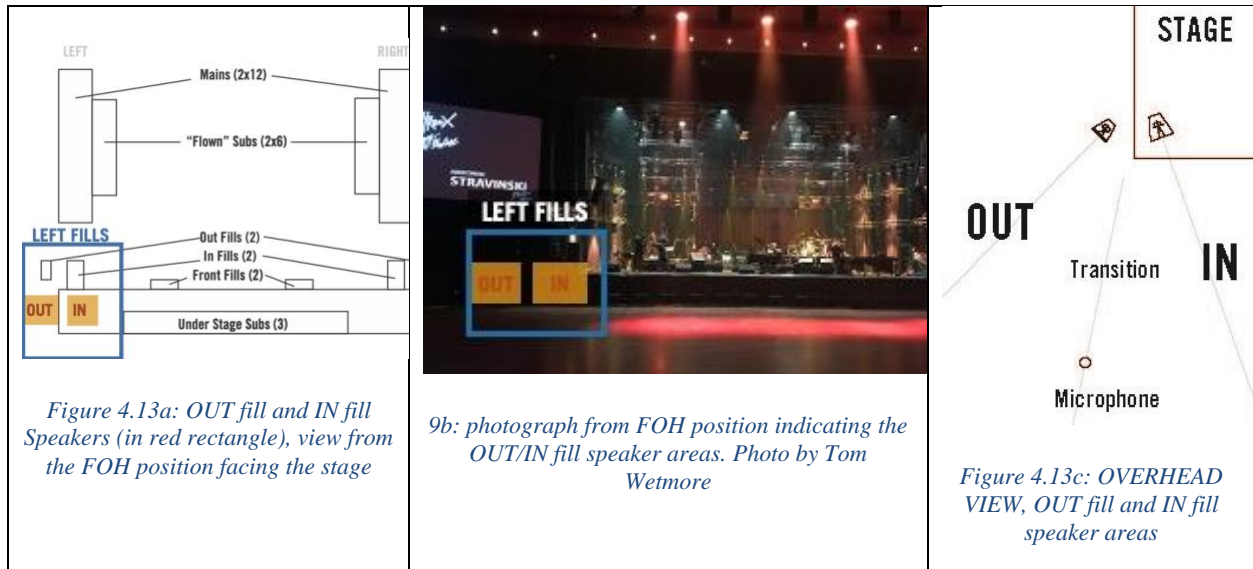
sections of the room. This had been a gargantuan task. And I'm not even mentioning the less glamorous but potentially more important process of plugging all these speakers, mounting them, and pointing them in the right directions.

At the moment, the relatively minor detail on the agenda was to tune the two “fills” on the left side of the house, quite close to the stage (see Figure 4.13). One speaker, “the out fill,” points slightly outward (away from the center of the audience), and another speaker, the “in fill,” points slightly inward. (Since these speakers go by many names, I will simplify by referring them as IN and OUT throughout this discussion.²⁹) Because these two speakers interact with each other (their sound fields will overlap in space), they must be aligned with each other and with the main arrays. With the measurement microphone placed at the crossover point³⁰ between the two coverage areas, the “tuning”—that is, making changes in the processors that would change the sound coming out of the boxes—was done from the front of house position where Magú had perched his laptop (Figure 4.12). But something confusing was going on in the SIM's readout.³¹

²⁹ The out fill is also referred to as “out fills,” “the UPA,” and “the UPAs” and the in fill is also referred to as, “in fills,” “the UPQ,” or “the UPQs.” The acronyms come from the specific Meyer loudspeaker model names. The similarities between the acronyms can cause mix-ups even between experienced techs like José and Magú, who I observed casually mixing them up a few times. It appeared they were usually able to understand each other from the context, though on at least one occasion I observed confusion involving switching “UPQ” and “UPA.”

³⁰ The crossover is the line in space where the relative volume levels of two speakers is the same. The goal is to make it so this point, and any other point between the speakers is the same level as the “on axis” positions of the individual speakers. In other words, if you stand directly in line with speaker A, the level should be the same if you stand directly in line with speaker B. The crossover is where the overlap of both speakers A and B results in the same level as either on-axis position. In Figure 4.13c, the crossover area is the line between the IN and OUT on which the microphone. I label it “transition” in the figure, which is another common term for crossover.

³¹ For the current purposes, the granular details of what exactly was confusing him—which I documented in detail—is less important than the general narrative. I will provide a fuller description and transcription in an appendix.



“I don’t like this,” Magú said, after several attempts to make sense of what he was seeing and hearing. It is not uncommon to be confused by SIM traces, which can be difficult—or even impossible—to decipher. The sheer acoustical complexities of physical acoustics and digital/analog mediation make it so the sound entering the microphone, and the visual analysis of the resulting audio signals, is rarely as clear as one would like. Though the causes for confusing data can often be speculated on with reasonable confidence, they are just as often either too tedious to track down or too physically complex to even try. Common problems include unwanted room resonances, complicated reflective patterns, environmental noise, and poor mic placement.

Magú and José made numerous attempts to change the audio test signals and get readings they understand. They played pink noise from different combinations of speakers, to see how it would change the SIM readouts; they adjusted the digital processing; they looked intently at different screens in the SIM. They found no answer. The crux of the issue eventually revolved around some hard-to-explain bumps in certain frequency registers, and they couldn’t quickly

ascertain which speaker, or which interaction between speakers, might have been causing it. Having reached an impasse in the visual domain, José suggested a new approach.

“Okay,” José said, “so now let’s play only the [IN] and the [OUT] to see if the interaction is as we fear it is.... We can walk around and listen if there’s—uh, the interaction [we fear].” He was talking about listening to music.

* * *

A few seconds later, José and Magú were pacing back and forth in deep concentration between the IN area and the OUT area, José cupping his chin in his hand while Magú seemed like he was struggling to put his observations into words (Figure 4.14).³² Only the IN and OUT were playing. We were all tired, but there was a certain relief in the air because we were now testing with music and not “annoying” pink noise, which had been a constant presence for the past eight hours (Meyer 1984). Usually this “walk around” test is performed to make sure the “crossover area” sounds acceptable, that the transition between coverage of one speaker and another speaker doesn’t exhibit any unwanted sonic behavior. If the speakers overlap too much, it could be too loud. If they overlap too little, there could be a quiet spot in this area. If the speakers are not properly time-aligned, there could be unpredictable summing and cancellation, such as the dreaded “comb-filter” effect.³³ Sometimes unwanted sonic artifacts can be detected easier with the ear by walking back and forth than through measurement. This time, José and Magú were hoping to either find straightforward explanation for what had confused them in the





³² See fieldwork video: <https://rebrand.ly/StravinskiTuning>.

³³ When similar signals overlap with slightly different relative phase (meaning the peaks, troughs, and every other part of the physical wave) are arriving at different times, there is a potential for some frequencies to entirely cancel each other. This tends to happen in a repeated patterns up the frequencies, resulting in a frequency response graph that looks something like a comb, with cancellations jabbing downward like the teeth of a comb.

SIM readings or, even better, to find that the sound was actually just fine and they could simply move on.

In principle, trying to track down any problems or confirm their nonexistence could have been done using SIM, but it would have required either (1) many more microphones or (2) moving a single mic around the area, pausing a few seconds at each location for the SIM to make a reading. (Adding to the clumsiness, the SIM and its visual readout was fixed at the FOH position, which would have thus required some running back and forth between positions or shouting back and forth between two techs.) In any case, though the ear might not be so good at producing quantitative data like the SIM, it is quite adept at hearing subtle differences between sonic environments. For these and other reasons, such ear-based tests are crucial.

	<p><i>Figure 4.14a: Facing the stage, the area under consideration is marked by the red box on this diagram. The left speaker within the red area is the “out fill,” a Meyer UPA, and the right speaker is the “in fill,” a Meyer UPQ. I will call these OUT and IN.</i></p>
	<p><i>Figure 4.14b: Overhead view of the IN and out OUT areas. During this process, we are walking between the two areas</i></p>
	<p><i>Figure 4.14c: José (left) and Magú (right) in the OUT area (see Ex. 2a). Notice the measurement microphone. It is placed directly at the precise half-way point between the IN and the OUT. The two men are on the “outside” of an imaginary line drawn from the corner of the stage and the microphone (see Ex. 2a).</i></p>

	<p><i>Figure 4.14d: They walk through the “transition” or “crossover” area to the IN area, listening deeply.</i></p>
	<p><i>Figure 4.14e: In the IN area, Magú (left) explains how it feels like a “totally different environment”</i></p>
	<p><i>Figure 4.14f: Back in the OUT area again. Magú: “It sounds like the horn is damaged.” The SIM measurement microphone (top left) is a constant presence.</i></p>
	<p><i>Figure 4.14g: After silently observing Magú’s silent listening, and listening to Magú’s judgments, José finally speaks. He agrees that the spaces sound different, “but the transition is good.” All photos by Tom Wetmore.</i></p>

After the three of us arrived in this small corner of the room, it seemed as though the verbal silence between José and Magú was longer than usual. They had done the same walk-around process a few minutes earlier on the right side of the house, and it took well under a minute to return to the SIM satisfied. This time, they were much more deliberate, cautious, and reserved. José kept his hand cupped around his chin while he walked back and forth between the two areas, while Magú walked similar paths with his head down and shoulders slumped in concentration, his hands sometimes interlocked behind his back. José seemed to be following

Magú's lead, and it was readily apparent that both felt something was not quite right. José didn't seem to want to speak first.³⁴

At first, I mostly paid attention to what *they* were doing. I tried to discern from their facial expressions, their physical posture, their walking rhythm, their verbal and non-verbal communication, what they may have been thinking and feeling about the sound. But as I walked back and forth between the two areas, pausing at various moments, looking at the speakers, looking away from the speakers, closing my eyes, reopening them, I start wondering to myself whether what *I* was hearing was correct: an obvious difference in the two areas. The OUT area *did not sound right*. It was hollow, almost tinny. It didn't really seem like an issue of frequency response, as if something was off about the EQ. Though it did sound like there were some attenuated levels of low and mid-low frequencies, more importantly the sound just seemed *small*, narrow, and almost metallic. And somehow fuzzy. It seemed quiet and isolated.

When I walked in the IN area, everything seemed more or less as I had grown accustomed to expecting from other parts of the sound system. If I looked straight at the speaker I could tell sound was coming from it, but when I closed my eyes and just listened, the sound image wasn't spatially narrow or pinched, the spectral balance didn't seem constrained, and the definition throughout the frequency spectrum was clear and present (I could pick out different instruments, rich tonal details of cymbals, and so forth). As I moved again to the corner with the OUT speaker, it *just didn't sound right*.

³⁴ It felt like an odd reversal of the usual dynamic. José is the boss, and in addition to the obvious power differential between the man in charge and the man "assisting," Magú had consistently been free and genuine in expressing his admiration for José's talent and skills. But now, José, perhaps feeding off the palpable feeling that something wasn't right to Magú's ears, was staying quiet and waiting on his partner to speak.

But I felt insecure around José and Magú, who were known virtuosos at room tuning. So, I was deeply curious about what they felt. I was in the doubly disorienting state of (1) not knowing if I could *trust my ears*, especially in comparison to two specialists who do this for a living, and (2) not knowing what I was *supposed to be listening for*. Was I supposed to be compensating for something I didn't know? Was it *supposed* to sound this way? Perhaps when the other speakers are also playing the gaps I was feeling would be filled in, and maybe José and Magú were already mentally compensating for such expectations. Magú and José seemed uncomfortable too.

Adding to the affective atmosphere of uncertainty and tentativeness, of a shared sense of something *just being off*, was the constant presence of the technology itself. As can be seen in Figure 4.14a-f, the SIM measurement microphone was a constant presence in our “deep listening” as sensing bodies traversing space (Bull and Back 2003). Not only was the microphone a constant reminder of a very real participant in the collaborative process of understanding and thus interacting with the sound as system, but it was also a reminder of the digital analysis data that had already informed our listening. In a sense, it was the technological system, with its confusing readings, that had *drawn* us to this physical location in the first place. (More on this below.)

Magú was the first to talk. And when he did, I got confirmation of my vague impressions. “The level,” he said, pausing in the OUT corner, looking at the same speaker that had troubled me (example 2b). “The level, is not—I don't know.” He trailed off, crossing back over to the in fills, head down, eyes mostly closed, José silently trailing behind.

“Ah-ha! Two entirely different environments! This is louder. And it has more—more bright.” José stayed silent, still following Magú as he returned to the out fills. “Here, it's like the

horn is damaged.” This is a serious judgment and pretty much confirmed my own initial encounter. Magú clearly wasn’t happy about it, though he added: “But this is isolated.” In other words, though the speaker sounded faulty, it wouldn’t cause many negative effects on the rest of the space because its coverage only overlapped with the IN speaker, and in no significant way with the main array. From a tuning perspective, it was one of the least consequential speakers in the whole system. (It also pointed mostly at a hallway, where not many patrons would be.)

Though José’s demeanor exhibited sensitivity to Magú’s worries, he didn’t seem troubled: “I think the transition is good. It doesn’t sound amazing, I’m just saying. I don’t think it sounds...the same exactly [between the two areas], but—I think we could release the shelf in the OUT a little bit.” The proposal to “release the shelf” was a modest potential EQ fix to what my and Magú’s ears discerned as a serious quality issue. (José’s “it doesn’t sound amazing” was assuredly a drastic euphemism.) But any alternative would take much more listening, discussion, testing, and experimenting. And there were plenty of reasons to avoid all that. It was late, we were all tired, and the clock was ticking. Besides, the offending UPA covered an insignificant proportion of the audience. As Bob McCarthy says frequently, the goal is to make everything serviceable *first, then* get increasingly detail-oriented if time permits. Here was a clear case of this principle.

So, instead of belaboring the issue, José and Magú simply moved the measurement microphone further to the center of the stage and moved on to the next task. The issue of the OUT speaker was dropped. With a mood of uncertainty still permeating the air, but having decided to move on to other systems, we returned to the analyzer to see what it had to say about the next task.

* * *

“Front fills, front fills, OK,” Ramirez says to himself as soon as he got back to the main tuning station, looking at the SIM screen and flipping through processor settings on his laptop. He had moved on to the next task, the “front fills” that line the stage (see Figure 4.11).

“Wow! The front fills sound pretty cool!” Magú said. The previous controversy was mostly left behind as Magú started to dig deeper into the work of time aligning the next set of speakers. Yet, as he continued flipping through screens and punching buttons on the glowing racks of gear, he muttered one last time, “Yeah, but these—the [OUT] fills—there’s something weird.”

* * *

What we have seen in the above narrative is a shifting between the visual gaze, the touch of the machine, and the deep listening of the human body moving through space—all of them contributing to a shared construction of knowledge about sound and a negotiation of how the mediated environment should be constructed. What started as a mostly tactile and visual affair shifted dramatically when Magú encountered confusing readings that prompted the three of us to move to the area in question. Indeed, it was the *machine*—which itself was a complicated network of physical solids, signals, data, processing, and transductions—that drew us to that area, that directed our visual and aural gaze. As Steven Feld writes, “No study of music today can ignore the history of mixings of organic and mechanical materials, specifically technological enhancements of primal bodily capacities” (2017, 94). In this example, the whole testing system, the microphone, the cables bringing signals to the SIM, the processors sending sound to the speakers while the SIM compared that sound to mediated version captured by the microphone—and even the very act of placing the microphone where it was, and *deciding* where to place it—were just some of the elements comprising the delicate dance of bodies, sounds, and signals through which the process of negotiating the sound of the room emerged.

Deep listening was enhanced by an assemblage of human and non-human actors. Magú and José's listening was informed—and, in some senses, *directed*—by the machine's visual readout. This readout was in turn overdetermined by the audio signal it was sent, the microphone that transduced the signal from mechanical waves, and the spatial positioning of that microphone in the room. Not to mention the immeasurable complexity of mechanical vibrations throughout the gases and solid surfaces of the room. Also, not to be ignored are the technicians' listening practices—and their discussions about their listening—and how they inform their understanding of the machines and the space.

In sum, this episode provides a window into the ways that room tuning is a contested, multisensorial affair across human and non-human actors (Latour 2005). In effect, the network of machines, room materials, and human practices of looking and listening *directed this action* in what Jane Bennett would call a “human nonhuman working group.” And with it, this assemblage exposes Feld's (2015) idea, through acoustemology, of “the relationality of knowledge production” (13). Therefore, this incident reveals the act of tuning the room as a vibrant crossing of human and non-human forces that demonstrates amplified sonic environments as sites and modes of knowing, doing, and being. My observations defy notions of sound systems and rooms as merely blank media or containers, and they demand a refocusing of our attention to a wider conceptualization of live musical performance beyond the sole territory of human subjectivities, and beyond the temporal and spatial demarcations of the “live performance” itself. In the next example, I will dig more closely into the power of visual data to condition human social action.

4.6. Example 2: “I’m Going to get Phone Calls”: On the Visual, the Aural, and Politics of Aural Knowledge

The following ethnographic narrative exemplifies how quantitative visual data—which is meant to be objective and translatable—can be interpreted differently depending on one’s social position (occupation, training, philosophy of sound, etc.), and how these varied interpretations can lead to real material effects. Effects that can be heard. Specifically, I describe how José and Magú opted not to use a particular method of sonic enhancement they both agree *sounds* better (and, to their trained eyes, looks better, too). They did this out of a concern that visiting engineers might misinterpret certain visual data.

The controversy concerns a delicate audio technique called “phase steering.” Such a technique involves carefully tweaking the phase characteristics of different speakers in a line array, such as the 12-speaker main arrays at Stravinski (see Figure 4.11). The goal of these phase adjustments is to make certain frequencies travel farther, louder, and in a more focused spatial shape (a tighter “beam”). The particular technique at issue here uses patterns of phase summation and cancellation to “throw” the mid-to-low frequencies a farther distance without affecting other frequencies (Meyer Sound, n.d.; see Figure 4.15). In other words, by very carefully adjusting the phase interactions between adjacent speakers on an array (getting certain frequencies ranges to arrive ever-so-slightly later than others), desired frequencies are made to constructively interfere (get louder) in some places and to cancel each other out (get quieter) in other places. In this case, the goal is to push the low-mid–frequency waves louder, farther, and in a more focused shape to

the back of the room. Meyer Sound has branded their implementation of this technique Low-Mid Beam Control, or LMBC.³⁵

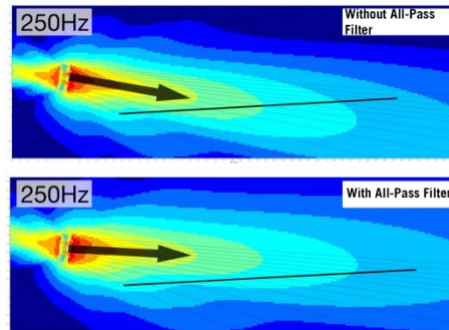


Figure 4.15: Low-Mid Beam Control (LMBC)
This graph compares of coverage at 250 Hz (low frequency) with the LMBC activated (top) and without it (bottom). (Adapted from Meyer Sound, n.d.)

LMBC addresses a perennial problem for venues of a certain size: that lower frequencies are not as directional as high frequencies,³⁶ and places like the rear balconies don't get the same amount of low-frequency sound as higher-frequency sound.³⁷ (And this not something one can fix with equalization or simply adding low-frequency speakers without causing complicated side effects.) Figure 4.15 shows two low-sound beam shapes, one without LMBC activated (top), and one with it activated (bottom). The salient point is that the black arrow points a little higher in the bottom picture, which would be considered “beam steering” or “throwing” low-frequency

³⁵ Meyer's LMBC is a sub-class of an array of techniques that use *all-pass filters*, sometimes called *all-pass delays*. The technique is sometimes called “the all-pass filter” in everyday conversation (e.g., field notes, June 26, 2018). Basically, all-pass filters allow all frequencies to pass through at equal magnitude while delaying some of them (on the order of milliseconds). There are countless things one can do with such filters, including many different kinds of phase steering. Often, technicians will refer to phase steering in general, or LMBC in particular, simply as “the all-pass filter”—even though all-pass filters can be used for many other things.

³⁶ As an extreme example, try pointing a home theater subwoofer in different directions: it doesn't really make a difference, even if it feels nice to have the speaker cone looking right at you as you listen. The non-directionality phenomenon isn't as pronounced for the low-mid frequencies that LMBC focuses on, but the principle is the same.

³⁷ This is a common problem for musical theater productions, and one that I've observed many people discussing, both formally and informally (e.g., field notes, December 13, 2018, in which Bob McCarthy discussed this problem with a handful of Broadway mix engineers over drinks in midtown Manhattan).

sounds to the back of a balcony. This is precisely what Magú wanted to do at Stravinski (Meyer Sound, n.d.).

Such a technique has only become possible in the last few years, and it is still considered difficult and “exotic” (McCarthy 2016, 26). It is very rarely implemented.³⁸ For this chapter, the technical nuts and bolts are less important than the overall points I want to get across in the following ethnographic account: (1) that LMBC is a new and delicate technique that allows a level of control over sonic space that would not be possible without advanced scientific thinking and technological instruments; (2) that the visual serves as a primary modality for getting the technique to work and demonstrating if it is successful; and (3) that despite both Magú and José agreeing that it works, and that the visual measurements confirm that it works, they don’t end up using because José is concerned about “political” consequences.

4.6.1. The Narrative

The LMBC was Magú’s project. It wasn’t firmly part of the plan to use it, but more of an experiment. They’d use it if it worked. José didn’t seem particularly interested, probably because it simply takes too much time to set up, is too much of a hassle, and is low on the list of more fundamental priorities.³⁹ In fact, it was only Magú’s personal initiative that even opened the

³⁸ As such, there is virtually nothing written on it, aside from a few online discussion groups. Bob McCarthy’s book *briefly* refers to it (see following footnote). The only official description I’ve found is in a Meyer Sound educational/marketing video. (Though it is not cited in the video or in its the description, the overdubbed voice on the video is clearly Bob McCarthy’s.) The LMBC capability was only released for their processors in 2017.). I’m not aware of any other company that markets this function, though I’m sure it is coming soon for many if it hasn’t already.

³⁹ José’s attitude seems to mirror Bob McCarthy’s, who only glances at LMBC in his book. McCarthy (2016) describes LMBC as having “some exciting potential” but cautions readers “that such a tool will require much greater skill for application than traditional filters. Exotic solutions such as this should not take precedence over the overall task of uniformity over space.... It will be a happy day in the future when we reach a point where we have speaker systems in the field that are so well optimized that the only thing left to do is to fine-tune all-pass delays” (27). Here, “all-pass delays” is a generic term for what LMBC, which is a specific proprietary method.

possibility of using it. Indeed, when José went on his dinner break, Magú stayed behind in the auditorium (with me), skipping dinner to try to make it work on his own.

Though Magú is a clear believer in the value of the analyzer, his first instinct is to listen—more so than any Meyer employee I’ve met. Magú himself brings up this fact a lot. So, after he set up the LMBC at the mix position—which is all done through the processor interface on his laptop—we both climbed up to the back of the theater and listened while another technician flipped the system between two settings, LMBC on and LMBC off, while music played through the main arrays.

“Yes,” he told me, as we both sat in the last two seats in the house, “so, right now I can detect changes, but I need to *show* the changes to José, otherwise he will not be interested to use [it].” Magú heard improvement (he could “detect changes”), but he knew that a listening test such as this would not “show the changes to José.” Thus, *visual evidence* was necessary. Magú then explained how he considers José, who is younger than Magú, to have a more virtuosic “brain capacity” for math and technology, and that José places more value than Magú on numbers and visual data. This, Magú started rushing to take quantitative measurements—to get visual corroboration to prove his case.⁴⁰ He seemed excited by the challenge, hustling around the balcony, putting the measurement microphone in different places and hurrying back down to the SIM (on the floor FOH position) to record the traces (see Figure 4.16). The final measurement was the most important: the last seat in the center of the balcony (where we had been seated). If

⁴⁰ Interestingly, this is a kind of reversal of an episode from the previous year’s festival. José was explaining to me how he designed the sound system for the Jazz Club venue at the MJF. Because the design was somewhat unconventional (and required more speakers), he told me that “with these guys, you have to *prove everything*” with numbers and visual data. He went on to show me how he had to do a full mockup with MAPP XT (see my discussion above) and come up with quantitative explanation for why his idea would be better. In that situation, “these guys” were the ones that needed to be convinced with numbers (pers. comm., July 8, 2017).

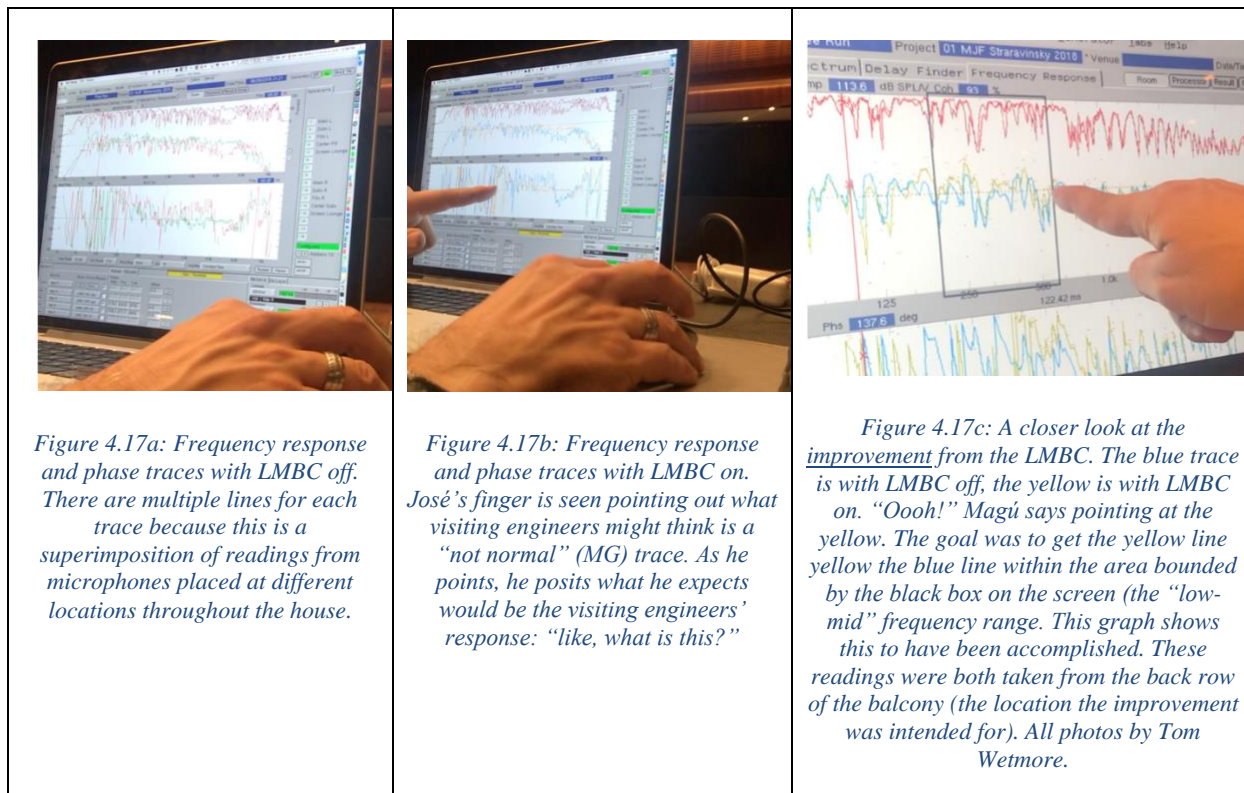
LMBC could boost the low-mid sound in that location, Magú would have attained his goal. By the time we returned to FOH after placing the microphone for this last measurement, José was back from dinner, and we all gathered around the SIM.



Figure 4.16: Magú rushing to gather visual data before José returns from dinner, going back and forth between placing the measurement microphone and looking at SIM screens. Photos by Tom Wetmore.

“Ooooooh!” Magú said, as we all look at the screen. A flickering, jagged yellow line was climbing up and above a similarly jagged, but unmoving, blue line. The yellow line was the “live” measurement of frequency response (what the microphone was capturing at that moment, with the LMBC on), and the blue line was a stored measurement at the same location with the LMBC off.

“I think that we are there,” Magú said, pointing to what he called the “benefit” on the screen. This improvement was represented visually in a section of the graph (the low-mid frequencies) where the yellow line (LMBC on) was higher than the blue one (LMBC off; see Figure 4.17c). This is what José and Magú wanted: more low-mid sound at the back of the auditorium.



Both men studied the graphs, flipping between different screens and discussing (Figure 4.17a-c). José didn't seem excited. Magú, as he often does, suggested they listen to music to decide. José hesitated:

JG: Well...before we go further than this, we have these two political questions. First, people—so—people here show up, take a Smaart [a measurement from a competing audio analyzer],⁴¹ take measurements. If they see this, we'll need to—we'll have to explain the filters.

MR: When they see—what?

JG: The wraps—this wrap [he points to the phase traces⁴² with the LMBC on; see Figure 4.17b].

MR: Yes?

JG: They'll be like, "what is this?" So, we'll have to explain it. That's one thing that I'm worried about.

MR: Okay.

⁴¹ For more on Smaart, see footnotes 9 and 15.

⁴² Note: "wrap" = phase trace = phase versus frequency line graph as recorded and displayed by SIM.

JG: The second thing is...we could do one preset with, one preset without [thus giving visitors the option to switch between LMBC on and off].

MR: Yes.

JG: [It's] never going to change [engineers will never use it].

MR: So you're telling me—you're telling me that the [visiting] guys will see these wraps, and they will think that this is normal [Figure 4.17a, traces with LMBC off] and the other [Figure 4.17b, phase with LMBC on] is not normal?

JG: Yes.

MR: Okay I will not argue with you. But for me this is bullshit. Most of the technicians don't know how to read phase.

JG: Yes.

To simplify: LMBC made the frequency response look (and sound) better but the phase look worse. Which is to say the phase looked worse to people who “don't know how to read phase.” In this moment, the way the system sounded started to seem less important than the way it looked, as filtered through the analyzer. The ragged lines on the computer screen thus asserted an outsize role in mediating the process of setting up sonic space.

Both José and Magú agreed that LMBC worked (though only Magú had actually listened to it). But there was something about the way the phase *looked*—and the way it was subject to multiple interpretations (some more defensible than others)—that made José concerned. Thus, an issue of sonic enhancement, when mediated through visual representation, became overdetermined by non-musical and non-sonic interests. Most notable was the “political” matter of “hav[ing] to explain the filters” to visiting engineers.

Magú, though puzzled over why they should worry about misguided visiting engineers, promptly deferred to José:

MR: I don't dispute the argument.

JG: No, no wait, I just want to discuss with you.

MR: You are the one that will be here. You are the one that will be here.... [José deals with visiting engineers throughout the whole festival, while Magú leaves before it starts.].

JG: So, what I mean is, if you want to put LMBC on, we need to do a filter without—a snapshot [preset] without.... I think it's a good idea.... It would be great to use it. [But] the *byproduct of this is that I get phone calls every day*. I need to show up by getting here to explain what is this doing [*sic*]. This is the byproduct of this. So...if we use LMBC, it's fine.... But we need to make two snapshots.

MR: Yeah, no. Actually, no. I will remove the LMBC.

JG: No, no.

MR: We will not [use LMBC]. But the explanation that you are giving to me—

JG: Huh?

MR: The *explanation that you're giving to me is the most funny that I have heard.*

JG: Okay.

MR: [...] For me, like—guys that come with the Smaart.... *They do exactly everything that has not to be done [sic]....*

[...]

JG: Don't get me wrong, I'm not saying that we're not going to use it, I'm just saying *there's a lot of other implications than looking at traces.*

MR: I understand. I understand...

[...]

JG: The thing is—the only guys that are going to raise some hell is the day we have like 20 instruments on stage on the other side of the festival and I have to run here and explain.

In the end, José and Magú did not implement LMBC for the festival. They never even listened to it together. José's concern that he would be forced to deal with "phone calls" from confused visiting engineers, and his fear that visitors would "raise hell" at the most inopportune moments, was ultimately enough. Magú found José's explanation "the most funny that I have heard," especially since he felt visiting engineers don't know what they're doing and "do exactly everything that has not to be done." But he ultimately dropped the issue. Rather than focus on the sound itself, this entire debate is over what the sound *looks like*.

In this example, the visualization of sound provided by the SIM did not provide a clean objectivity and transparent communication. Instead, it was the source of potential controversy and practical headaches. We see not only a contrast in how Magú and José engage with sound and sights—Magú often pushing to listen, José often opting for visualizations—but we see the methods of "scientific" visualization as *resistant to*, rather than fostering, transparency. Indeed, SIM visualization foreclosed the potential to use the LMBC by restricting José from even listening to the system with it activated. (He never did.) This exchange is yet another example of how what from the distanced perspective of theoretical musing can be easily conceptualized as a

sonic space as an “abstract” and controllable object but is in practice—in the “science of phenomena” rather than the “science of laws”—a much more complicated affair (Stengers 2005).

4.7. Conclusion

Both of my ethnographic narratives show how sound system tuning “in the field” presents a very different perspective than the clear-cut rationality implied by the art/science line and the Meyer philosophy of the sound system as an abstractable and measurable scientific object. The process on the ground reveals a host of influences: unexpected and confusing technological analyses, communication breakdowns, outside distractions, time constraints, fatigue, imagined audiences, and so forth. The point is that neither the objective laws of science, the express will of human subjects, nor the networks of technologies and bodies fully determined the way the room, ended up sounding. Indeed, these examples show the “significance of sound less as a point of consensus than of negotiation” (Sakakeeny 2010; see also Meintjes 2003; Ochoa Gautier 2006).

Of all the tunings I’ve observed, there has never been one without surprise, when the room, the system, the technology, or any number of other non-human actants did not make their influence known. Indeed, I find it useful to deploy Bennett’s (2010) concept of “the agency of assemblages” (21), in which the capacity to produce action “becomes distributed across an ontologically heterogenous field, rather than being a capacity localized in a human body or in a collective produced (only) by human efforts” (23). In my first ethnographic example, José and Magú participated in, fell out of, then rejoined and reshaped various such assemblages, crossing human and non-human materialities. For example, at the beginning of this episode, Magú encountered confusing blips on a computer screen. The reason for the confusing readings were never known. But somewhere in the vast network of wires, waves, reflections, and digital

number crunching, the SIM machine lost its ability provide coherent data, and the machine's promise of "objective" truth about sound fell away. We never found out what caused the readings, but it is clear that they made something happen. They prompted José, Magú, and me to move. And to listen.

I am not ascribing *intentionality* to the confusing readings or the network of nonhuman things that led to them showing up on the screen. But I do want to emphasize how this relatively minor episode chips away at the pretense of *human intentionality* as the sole agentic force driving the action. And it complicates the idea of science and technological apparatuses as transparent modes of accessing truth about the physical world.

The second example also challenges the epistemological authority of visual representation and scientific analysis. Here, visual data, even when it made sense to well-trained individuals, was a point of potential contention and politics. According to José, engineers would not interpret the data the same as José or Magú. The very *potential* for this confusion—and the "phone calls" it could lead to—was enough to tip the balance away from using a solution that could have improved the experience of the audience. In this case, the measurement data specifically caused the room to be *less* accurate and even.

These are just two examples out of many more I could have selected. But they are enough to demonstrate my main point: that visual data and high-resolution measurement are not free of contestation; they do not always provide transparent and complete truth about sound; and they are not always cooperative with the desires of their human operators. As a result, we should rethink the idea of sound technology as the province of unquestioned human agency, where science and technology can be unproblematically enrolled to *do what we want*.

But I don't mean to imply that my observations subvert the philosophy behind the methods, technologies, and ideas discussed in this chapter. In a very real sense, my interlocutors are enormously successful at what they do, and in precisely their own "scientific" terms. These rooms *do* have remarkably uniform coverage throughout space. They *do* offer full spectrum reinforcement at impressive levels of sonic detail and intelligibility. And, for most of the tuning, the technologies and procedures work just as they're supposed to.⁴³ I could have recounted hour after hour of straightforward measurements and adjustments. Much of the process is routine precisely because the technologies and methodologies work. In short, the Meyer approach is successful in using audio technology to construct sonic spaces that are highly controlled and effectively quantified. And they wouldn't be able to do this without the embrace of scientific concepts.

This chapter has analyzed approaches to controlling sounds and space that are technoscientific in the extreme, but it hasn't had much to say about jazz or other key conceptual problems at the heart of this study. In chapter 5, I will discuss some pressing implications of the pretense of scientific objectivity and control discussed here, which I will relate to jazz and the way it is proposed to sound at JALC and elsewhere. Much like the western art aesthetics I have discussed in previous chapters, these acutely technoscientific modes of mediating the sound of jazz entangle the music with frameworks that are dissonant with jazz's power as an agent of oppositional energy. Specifically, I focus on how the methods and ideals discussed in this

⁴³ And, besides, as a well-developed body of literature in science and technology studies has shown, even the hardest of the hard sciences are subject to many of the very same contingencies that I have discussed in my ethnographic descriptions. I discuss this further in chapter 5.

chapter share striking material and conceptual genealogies with many of the frameworks that have long undergirded western systems of race- and gender-based inequality.

Chapter 5: Black Boxes, Pink Noise, and White Listening: Rationalizing Race, Gender and Jazz

*“You’ve taken my blues and gone—
You sing ’em on Broadway
And you sing ’em in Hollywood Bowl,
And you mixed ’em up with symphonies
And you fixed ’em
So they don’t sound like me.
Yep, you done taken my blues and gone.”*
– Langston Hughes ([1949] 1995)

*“Ultimately the “hardest” science is about the realm of greatest
boundary confusion, the realm of pure number, pure spirit... and the
preservation of potent secrets. The new machines are so clean and light.”*
– Donna Haraway (1991)

5.1. Introduction: Very Hard to Hear

In the previous chapter I revealed how a community of technicians use explicitly “scientific” techniques for measuring, designing, and controlling sound in ways that emphasize neutrality, transparency, and objectivity. These philosophical and technoscientific commitments carry with them claims to epistemological and social authority. In that chapter, I ultimately revealed how such ideals, when applied to the actual physical practice of “tuning” sound systems—applying their methods “in the field,” as my interlocutors say—are considerably messier than the distanced “realm of the pure number” associated with the natural sciences (Haraway 1991, 153).

In this chapter I return focus to my interlocutors’ investments in the capacity of science and technology to access objective ontological truth about “sound itself,” free of matters of subjectivity and social entanglement. While I problematized such ideas in the previous chapter, they nonetheless provide a “core ethos” (B. Svboda, pers. comm., July 8, 2017) that is central to how sound is conceived and approached at my field sites.

In the broadest sense, this chapter asks how submitting sound to the ideals of transparency, objectivity, and related “scientific” principles are related to whiteness, a concept I consider here as a hegemonic system that naturalizes the views, interests, and modes of knowing and being associated with white men (of a certain class) as “normal and right” (Bonilla-Silva, Goar, and Embrick 2006, 231). I further ask how these technologies—as well as those discussed in earlier chapters (i.e., physical acoustics and sound isolation)—contribute to George Lipsitz calls a “white spatial imaginary” at Jazz at Lincoln Center (JALC).

On the first page of his important book *The Possessive Investment in Whiteness* (2018), George Lipsitz writes: “Whiteness is everywhere in U.S. culture, but it is very hard to see” (see also Dyer 2017). A premise of this chapter follows analogously: whiteness is everywhere in my field sites (and elsewhere), but it is very hard to *hear*. In this chapter, I think of whiteness in at least three overlapping ways: (1) a mediator of material structural inequalities (white supremacy), (2) a set of epistemological postures and systems of categorization through which people and groups perceive and make sense of the world, and (3) a phenomenological *orientation* that places differential restrictions and affordances on bodies with varying levels and kinds of affiliations with whiteness and their ability to occupy spaces and institutions (Ahmed 2007). Though the term “whiteness” itself evokes race and ethnicity—an evocation I recognize and purposefully mobilize here—I also consider whiteness inextricable from questions of gender, class, western coloniality, and other manifestations of difference and inequity.

In constructing this argument, I don’t want to erect or imply strict boundaries between essentialized “Black” and “white” ways of producing and experiencing sound, music, space, or anything else. There exists far too much diversity in genres of humanity, cultural/epistemological backgrounds, and phenomenological modes of dwelling to draw any firm and exclusionary

boundaries around any social categories, racial or otherwise. The destructive power of Black/white thinking on race is especially jarring considering the richly complex set of cultural dynamics that have been crucial to jazz's rich history from its very beginnings. Black/white thinking about race has dominated jazz ideology and historiography—even in much of the best scholarship—this precluding more nuanced discussions of jazz's history that would accommodate a wider range of diversity (Washburne 2020; Moreno 2016; Fellezs 2007; Ake 2002; Radano 2003). As Christopher Washburne (2020) states, binary thinking “collapse[s] cultural, national, and ethnic difference within both ‘black’ and ‘white’ communities in the United States and leave no space for those who do not self-identify with either of those two racial categories” (96).¹ Dismantling binary thinking on race opens up new ways to creatively think about human musical/sonic diversity from countless orientations largely erased from most thinking about jazz. I endorse this critique whole-heartedly.

Yet dismantling binary thinking does not require doing away with concepts like whiteness, Blackness, and other patterns of difference. To the contrary, it may challenge us to engage with them more rigorously, and to be more careful about how they are conceptualized. In this dissertation, I do not think of whiteness or Blackness in terms of classifying human beings but instead as a sprawling bundle of hegemonic relations consisting of overlapping sets of forces, structures, tendencies, discourses, orientations, practices, and so forth. I imply no firm stability or boundaries. And I certainly do not suggest that *all* people who identify or are perceived as white or Black must participate in whiteness or Blackness in the same way.

¹ Arguing for a more transnational, intercultural conception of jazz and its history, Washburne (2020) does more than assert a historiographical space for the primary musical topic of his book, *Latin Jazz*: by arguing against binary thinking he gestures toward the possibility of fitting countless other intercultural musics to escape the “erasure” of black/white thinking.

Let me focus back on whiteness for a moment. Following Sara Ahmed (2007), whiteness might also be thought of as an *orientation* or bundle of orientations that shape how people inhabit the world—or a “background to experience.” A person, group, institution, sound, or approach to sound can be *orientated* in many ways in relation to whiteness—with it, against, adjacent to it, and any number of other dissonances or congruities. The nature of these orientations can change moment by moment, conjuncture by conjecture, in different contexts and spaces. But while everyone relates to whiteness, not everyone occupies it equally, and some people may align more harmoniously—and enjoy its benefits—more than others. Whiteness thus intersects a wide array of the workings of racism.

So, I focus on whiteness here not to exclude people, groups, or ideas that aren’t generally called “white,” or people whose relation to whiteness is difficult to define, but to interrogate the cover *center* of a complex racial scheme that relies for its continued power on going unnoticed. Indeed, the most important aspect of whiteness I want to thread through this chapter is *transparency*, how a particular set of ways of perceiving, thinking about, and being in the world—a “white common sense,” “white habitus” (Bonilla-Silva, Goar, and Embrick 2006), or “white racial frame” (Feagin 2020)—can become naturalized as the dominant way makes sense of the world. Whiteness becomes so naturalized that it is rarely recognized. It serves as an ostensibly neutral framework against which marked subjects deviate.

As Ruth Frankenberg states in her important book, *The Social Construction of Whiteness: White Women, Race Matters* (2005), “whiteness does have content in as much as it generates norms, ways of understanding history, ways of thinking about self and other, and even ways of thinking about the notion of culture itself” (231). As I posit in this chapter, whiteness is also a

way of understanding—and even *perceiving*—sound and subjecting it to regimes of measurement and control.

And it provides a baseline set of epistemological givens and social rules that recede into the background but generally stack the game against people who don't occupy the privileged subject position of "rational" white male—what Sylvia Wynter (2003) calls "the central ethnoclass Man" (261). My aim is to explore how this kind of transparency shares a common set of ontological and epistemological frameworks with the notions of transparency espoused by my interlocutors in the realm of sound and sound technology. The basic hypothesis is that these two versions of transparency, in sound and systems of human classification, "have a common circulatory system" (Haraway 2018, 22).

In what follows, I recount histories and analyses of white sounding and listening and their attendant implications for the classification of the human—focusing mainly on race and gender. I highlight how normative white sonic values and modes of analyzing sound are naturalized as "normal and right" (Bonilla-Silva, Goar, and Embrick 2006, 231), and how they provide the conscious and unconscious standard against which the sounds of difference are heard and categorized

The first half of the chapter begins with idea of listening as an "organ of racial discernment" (Stoeberl 2016b, 4), as a system of differentiating people and perceiving and understanding the world from raced and gendered subject positions that are made to feel transparent, neutral, and unmarked—like nothing at all. White male modes of listening and sounding serve as the unmarked standards against which other modes are framed as divergent. I pay particular attention to Marie Thompson's (2017) critique of a "modest white aurality," which posits sound as an independently knowable physical entity that can be heard and analyzed

as prediscursive and strictly material—which is to say “properly ontological” (Bryant, Srnicek, and Harman 2011a, 4)—phenomenon, “beyond” the implicitly marginal issues of signification, representation, culture, or social identity. Such a posture, which I show to be deeply resonant with the Meyer Sound “objective” approach, is bound up with a historically white male orientation to the natural world, one that claims universality while marking all other perspectives as particular and thus marginal. Especially important is this community’s embrace of western science and technology, which I interrogate for their enmeshment in frameworks of Eurocentric rationality, disinterestedness, and visual representation as a “conquering gaze from nowhere” (Haraway 1988, 581)—all of which share various epistemological and political lineages with “Man” as the overrepresented subject of modernity (Wynter 2003; Weheliye 2014). My primary guide for this part of the conversation is the antiracist feminist science studies² of Donna Haraway (2018, 1988).

In the second half of the chapter, I turn to the problem of space, examining how the use of sound at my field sites, especially JALC,³ intersects with what George Lipsitz (2011) calls the “white spatial imaginary.” I outline how the aural environments at JALC privilege ideas of homogeneity, control, rationalization, and exchange value over contradictory ideals of the “Black spatial imaginary,” including heterogeneity, local community action, creative use of public spaces, and the privileging of use value over capitalist exchange. I use Matt Sakakeeny’s (2010) ethnography of a contemporary New Orleans brass band parade as a counterexample

² “Antiracist feminist science studies” is Haraway’s term, though it is not the only way she describes her sophisticated and ever-adaptable political/intellectual orientation. It is, however, used quite a bit in the primary text I engage with here (Haraway 2018).

³ Though my discussion of the white spatial imaginary would apply at least as much (and probably more) to MJF, I focus on JALC, mainly because it more vocally espouses Black cultural priorities, thus introducing important tensions that I discuss below.

emphasizing a particular brand of Black collective action. In Sakakeeny's narrative, overlapping human and non-human urban sounds create a "joyful noise" that celebrates community while reclaiming urban space. I contrast this and related sonic examples with the more controlled and acoustically quarantined sound of JALC, opening up new ways to question how JALC, despite officially embracing a vision of Black cultural leadership, withdraws from a wide range of Black musical styles and orientations. I also show how JALC recruits sound into the logic of capitalist exchange, deploying values like sonic transparency to construct their performance spaces as neutral, rationalized, fungible objects that can be rented out to the widest array of clients.

I close this chapter by exploring a key contradiction: that a white spatial imaginary might hold so much sway in an organization formally oriented around jazz as a specifically Black form of musical and social practice. I engage and deepen this contradiction, noting ways that both Black and white spatial imaginaries may overlap and enmesh. I ultimately suggest that, by orienting JALC's performance spaces, even in part, around epistemologies and spatial imaginaries of whiteness and exchange value, the sound of JALC's rooms contributes to an attenuation of jazz's utility as a transgressive political force and an expression of what Guthrie Ramsey calls jazz's "ethnocentric energy" (Ramsey 2003, 3).

5.2. Part 1: White Aurality, the Listening Ear, and Whiteness as "Universal Listening"

In this section, I begin a conversation about "whiteness as an auditory construct" (Stoeberl 2016b), questioning whether the "objective" approach to sound system design reflects a "white aurality" (M. Thompson 2017) rather than the presumed unmarked position of objectivity. This question draws me to the work of Donna Haraway, who shows how certain pretenses of scientific transparency and technoscientific visual representation—core attributes of my

interlocutors' approach to sound—are overdetermined by gendered and racialized modes of knowledge production and definitions of human subjectivity and personhood. I relate my ethnographic findings to these theories and argue that my interlocutors, their technologies, and their epistemological connections are all deeply linked.

5.2.1. Auditory Whiteness as Universal Listening

In her book, *The Sonic Color Line: Race and the Cultural Politics of Listening*, Jennifer Stoever (2016b) proposes the idea of a “sonic color line” as a framework for understanding how sounds and listening practices are articulated into systems of difference. Stoever creates the evocative rhetorical figure of the “listening ear” as the primary mechanism of this framework, describing it as

the ideological filter [that] represents a historical aggregate of normative American listening practices and gives a name to listening's epistemological function as a modality of racial discernment. An aural complement to and interlocutor of the gaze, the listening ear is what Judith Butler calls 'a constitutive constraint': a socially constructed ideological system producing but also regulating cultural ideas about sound. The listening ear enables the key dichotomies of the sonic color line...; it *normalizes the aural tastes and standards of white elite masculinity as the singular way to interpret sonic information*. (Stoever 2016b, 13; emphasis added)

The listening ear prompts us to imagine, recreate, and listen for aural markers of difference and sameness, to classify what we hear according to constellations of culturally mediated characteristics sedimented by years of repeated use and representations in media and everyday social interaction (radio, music, talk, the written word). The listening ear proffers “listening as an organ of racial discernment, categorization, and resistance in the shadow of vision's alleged cultural dominance” (4). People are unconsciously disciplined into the sonic color line such that listening to certain sounds, from certain bodies, reveals markings of socially constructed identities.

The sonic color line also shapes how one hears nonhuman entities and the aural environments. A police siren, for example, might be heard differently by individuals marked as “other” in dominance systems of racialization, for such individuals are attuned to their disproportionate exposure to police brutality. As another example, people more closely aligned with whiteness are more likely to interpret an array of environmental sounds linked to people and communities of color as disordered, noisy, or even threatening (Cheng 2018; Stoever-Ackerman 2010; Stoever 2016b). On the other hand, a white person speaking on the radio—or any other person recreating the normative *expectation* of “whiteness as an auditory phenomenon”—will come across not as a racially marked “white sonic identity,” but as a universal, unmarked “American” sound (cf. Mann 2008).

For this chapter, the most important aspect of the sonic color line is how it functions as the unmarked standard of both how to listen and how to sound while being specifically oriented around the tastes, desires, and interests that have become centered as norms in a society oriented around whiteness. As Stoever (2016b) states, “whites not only have been conditioned to see and hear the world differently but also have labeled and propagated this sensory configuration as universal, objective truth” (10).

Whiteness...is notorious for representing itself as ‘invisible’—or in this case, inaudible (at least to white people). The inaudibility of whiteness stems from...the belief that white representations stand in for ‘people’ in general, rather than ‘white people’ in particular. The inaudibility of whiteness does not mean it has no sonic markers, but rather that Americans are socialized to perceive them as the keynote of American identity. As dominant listening practices discipline the population to process white male ways of sounding as default, natural, normal, and desirable..., they deem alternate ways of listening and sounding aberrant and—depending upon the historical context—as excessively sensitive, strikingly deficient, or impossibly both. (Stoever 2016b, 13)

Whites are conditioned to reproduce the aural markers of whiteness while nonwhites are culturally disciplined to conform to what the sonic color line *expects* them to sound like. The

significant difference is that sonic markers of whiteness are never named as such but are instead placed in the universalizing category of “American.”⁴

I find striking resonances between Stoever’s articulations of auditory whiteness and the approaches to sound reinforcement discussed in the last two chapters. The very idea of an entirely “neutral” environment of sonic “spatial uniformity” carries all the hallmarks of the “aural tastes and standards” (Stoever 2016b, 13) of the almost exclusively white male community that creates these sonic environments (that is, my interlocutors). Indeed, the very *idea* of treating a room as a space of sonic transparency, as an abstract and quantifiable object of scientific scrutiny, is the product of a long and sprawling intellectual history constructed nearly exclusively by white men.⁵ Let me now expand on the scientific and philosophical problematics involved with thinking about sound in such a socially detached way.

⁴ Stoever’s primary historical and literary archive is oriented around the United States. Most of my conceptualizations are as well, but I also proceed on the premise that whiteness and white supremacy are *global* phenomena and that the racial trope of transparency intersects any space touched by European colonialism—be it material, epistemological, or otherwise) (see especially da Silva 2007; Wynter 2003; Mills 1999, 2017).

⁵ The *direct* lineage leading to the particular Meyer Sound-linked community I was immersed in is described in the opening pages of McCarthy (2016). The most prominent names include John Meyer, Alexander Yuill-Thornton II, Don Pearson, Julius Smith, Jamie Anderson, Sam Berkow, Drew Serb, James Locke, Dave Robb, and others—all of which present as phenotypically white. Similarly mathematical foundations of process trace through Jean-Baptiste Joseph Fourier (of course) and his more recent iterations by influential engineers like Harry Olson and the influential pairing of James Cooley and John Tookey, who developed the *Fast* Fourier Transform algorithm at the heart of nearly all FFT analyzers in operation today (most applications having nothing to do with audio). In my experience, the only “non-white” technician in the Meyer community was Mexican Mauricio Ramirez, Director of Training. His Mexican identity was often marked explicitly, including by Ramirez himself, through jokes and stereotypes (being accustomed to loud environments, familiarity with drinking culture, etc.; field notes, June 28, 2018; field notes, January 9, 2019). Other than Ramirez, the Meyer-employed technicians I engaged with most included John Meyer (President and CEO), Bob McCarthy (Director of System Optimization), Steve Ellison (Director of Spatial Sound), Jose Gaudin (Senior Technical Specialist and Sound Systems Designer and Head of Calibration for Montreux Jazz Festival), John Monitto (Director of Business Development), Merlijn Van Veen (Senior Technical Support and Education Specialist), Michael Brown (Technical Specialist), Roger Harpum (Business Relationships & Hospitality), and Brian Svoda (Technical Specialist), all of which present as white men. Note that anyone listed here with a more “executive” title (e.g., Director of Business Development) is *also* a veteran technician. At the time of my field research, everyone listed here regularly provided hands-on technical support and performed technical tasks (tuning systems, etc.). I neither encountered nor ever heard of any Black or female Meyer technicians. The only Meyer-employed women I encountered (more than superficially) were Helen Meyer, co-owner and Executive

5.2.2. “White Aurality” and the “Sound Itself”

Marie Thompson (2017) takes issue with the whiteness she finds endemic to what she calls the “ontological turn in sound studies.” According to Thompson, this wave of scholarship, which largely concerns putatively non-representational sound art, “disavows ‘old’ questions of culture, signification, discourse and identity, and promotes ‘new’ questions of materiality, affectivity reality and being” (266). In Thompson’s interpretation of such studies, questions of meaning and culture are eschewed in favor of inquiries into “properly ontological questions” aimed at “the nature of the sonic itself” (Srnicsek, quoted in, Thompson 267; Cox, quoted in Thompson, 271).⁶ To the thinkers Thompson critiques, any sonic attachments to social life and human modes of identification—as mediated through things like music, language, and other potentially discursive systems of meaning—are essentially considered unimportant, and even tedious, next to the deeper reality of sound as an independent material entity.

This “sound itself” approach presumes to seek out more universal truths about sound “beneath” what such thinkers consider to be more particularistic and subjective concerns of signification and culture. Aligned with science, objectivity, and universality—such approaches couch themselves in the presumed ontological realism of positivist understandings of the sound-

Vice President, and Jane Eagleson, Director of Communications and Artist Relations. By all accounts, Helen Meyer is a *very* important and influential person in the company, though she is not involved with any explicitly technical or scientific aspects (W. Marsalis, pers. comm., April 13, 2019; D. Hosney, pers. comm., December 19, 2016; S. Ellison, pers. comm., February 7, 2017). I never encountered a Black Meyer employee. I don’t have access to any quantitative demographic data about the company, but I am comfortable claiming that I either had close contact with or was aware of all the “top” employees of the company—certainly on the technical end. If there exists any more diversity in the company’s demographics, it is mostly in the lower ranks.

⁶ Thompson cites three theoretical trends as central to this turn: speculative realism, object-oriented ontology, and new materialism. I tend to think of the second as a particularly well-known (and effectively branded) subset, or intersecting stream, of the first. Graham Harman, who created object-oriented ontology, frames it this way (see, e.g., Harman 2011).

as-material to privilege such an ontology of sound over those “merely” reduced to concerns of representation, culture, or identity.

Thompson claims that the ontological approach, while denying cultural particularity by positing an object of inquiry “deeper than” or “prior to” signification, is neither transparent nor objective. Such a posture of disinterested universality is in fact reflective of a very particular—if very widespread—epistemological genealogy of whiteness. As Thompson puts it, the proposal of “a sonic materiality that can be cleanly distinguished as preceding sociality, discourse, meaning and power” requires an embrace of “‘modest’ white aurality”—a mode of listening that claims detachment from subjective concerns and thus posits the listener as a neutral observer of universal truths. This listener presumably transcends sociality but is in fact distinctly, if furtively, aligned with whiteness.

White aurality...amplifies the materiality of ‘sound itself’ while muffling its sociality; it amplifies Eurological sound art and, in the process, muffles other sonic practices...all the while invisibilizing its own constitutive presence in hearing the ontological conditions of sound-itself. White aurality is not an ahistorical, unchanging perceptual schema, insofar as whiteness and aurality are both material-discursive composites that shape and are shaped by one another and in relation to a particular environment, but nor is it simply the product of individual bias. Rather...white aurality can be understood as co-constitutive with, amongst other things, Eurological histories, practices, ontologies, epistemologies and technologies of sound, music, and audition. (M. Thompson 2017, 274)

The very pretense of seeking objective truth about sound, separating sound-as-material from its signifying or cultural entanglements, is to deny the reality of human difference and to devalue those who recognize and occupy such positions of difference.

This “sound itself” orientation aligns with what Zuberi and Bonilla-Silva (2008) call “white logic”: it strips sonic objects of their social content in the name of objectivity while it “grants centrality to the knowledge, history, science, and culture of elite White men and classifies ‘others’ as people without knowledge, history, or science, as people with folklore but not culture” (Zuberi and Bonilla-Silva 2008, 17). While the ontological position on sound

doesn't explicitly *deny* the "other" knowledges about sound, by centering *ontologies* of sound as transcending human differences, it casts all other approaches as marked, particular, and marginal.

But the "properly ontological" position on sound is as particular as any other. Put simply, the very idea that an observer can gain access to sonic realities "deeper" or "beyond" the implicitly provincial questions of representation and identity is a specifically *white male thing*. In the words of Jennifer Stoeber, this mode of imagining a "sound itself" beyond representation is a perfect example of how the sonic color line "normalizes the aural tastes and standards of white elite masculinity as the singular way to interpret sonic information" (13). Indeed, the discourse of the "properly ontological" as materially independent and objectively ponderable—from a distanced, free-floating posture—is itself inseparable from a specifically *western* system of science and philosophy (not to mention a powerful, white-coded tradition in sound art tracing much of its lineage back to John Cage; see G. E. Lewis 1996; Piekut 2012; M. Thompson 2017).

5.2.3. The Modest Witness and a "Culture of No Sound"

The "modesty" of Thomson's white aurality evokes the pretense that a rational individual may objectively observe matters of independent ontological fact, detaching from their own subjectivity. This idea is encapsulated most vividly in the figure of the "modest witness," a now-canonical concepts in mainstream and antiracist feminist science studies (Shapin and Schaffer 2011; Haraway 2018, 201; Potter 2001). Thompson references this genealogy only casually, but since it applies more directly to my ethnographic objects of study—and particularly how my interlocutors align so purposefully with science—I will expand on it.

Shapin and Schaffer first posited the concept of the modest witness in their landmark book, *The Leviathan and the Air-Pump* ([1985] 2011), which examines the founding moments of experimental science in the 1660s. The primary site of these founding moments was the

laboratory of Robert Boyle, where his famous air pump demonstrated for the first time the idea of a vacuum. In this laboratory, the very idea of scientific experimentation, and the correlated idea of the socially isolated laboratory as a privileged site of knowledge production, was founded.⁷ And it was here, Shapin and Schaffer claim, that Boyle and his contemporaries established the authority of the scientific apparatus—the machine—as a disinterested observer of the natural world.⁸

These new machines required trustworthy human witnesses to observe and report what they did. These “modest witnesses,” as Shapin and Schaffer (2011) dubbed these trusted human observers, were called on to deny their own subjective opinions and passions. “It is not I who say this,” the witnesses might claim, “it is the machine” (77). Thus was born the figure of the modest witness as the ostensibly objective authenticator of scientific knowledge.

Donna Haraway complicates this concept in her important book, *Modest_Witness@Second_Millennium* (2018; cf. Latour 1993; Piekut 2012). Haraway scrutinizes how only certain kinds of humans could serve as witness—that is white men of a certain class and professional position. Women, the poor, the non-white, and the sexually nonnormative could not serve as modest witnesses to new scientific knowledge. They were too affectable, too particular. And they didn’t occupy a form of personhood with the necessary social

⁷ So was the idea of the scientific “instrument” that could be used to reliably repeat a given experiment, and the notion that such an experiment in some way represented a natural phenomenon—in circumscribed, controlled form (Shapin and Schaffer 2011).

⁸ And it was precisely because the machine was considered to be isolated from the concerns of human beings that the secular knowledge it produced could displace the “transcendental” and “magical” ways of knowing that these early “scientists” were trying to unsettle (Haraway 2018, 23).

“independence”⁹ to bear the epistemological load of creating new knowledge. Only the privileged men could occupy the bodiless “transparency” necessary to institute this new mode of knowledge production.

This self-invisibility is the specifically modern, European, masculine, scientific form of the virtue of modesty. This is the form of modesty that pays off its practitioners in the coin of epistemological and social power. This kind of modesty is one of the founding virtues of what we call modernity. This is the virtue that guarantees that the modest witness is the legitimate and authorized ventriloquist for the object world, adding nothing from his mere opinions, from his biasing embodiment. And so he is endowed with the remarkable power to establish the facts. He bears witness: he is objective; he guarantees the clarity and purity of objects. His subjectivity is his objectivity. His narratives have a magical power—they lose all trace of their history as stories, as products of partisan projects, as contestable representations, or as constructed documents in their potent capacity to define the facts. (Haraway 2018, 23–24)

These white bourgeois men ascended to the new modern form of full political personhood—“the modern” (Latour 1993)—while those precluded from witnessing were marked with an epistemological/political deficiency that has continued, in many different forms, for centuries (cf. on language and tradition Bauman and Briggs 2003; Chakrabarty 2008; cf. on voice and aurality Ochoa Gautier 2014). This foundational site of exclusion from the production of knowledge was a “founding gesture” (Haraway 2018, 24) of western modernity.¹⁰

5.2.4. Tuning, Transparency, and the Modest Witnesses of Sound

There are unmistakable resemblances between Haraway’s modest witness, Thompson’s “modest white aurality,” and the “scientific approach” to sound system design and optimization

⁹ Independence here refers not only to the idea that women’s identities were tied to men, but that a modest witness must be *financially* independent. Independence of thought was thus tied to socioeconomic class. See Haraway (2018, 27).

¹⁰ Not only was this gesture an important moment in establishing scientific practice as a white male-dominated domain, but, as Haraway argues, it also served as an arena where identities were negotiated and formed. In other words, it didn’t not just exclude people occupying the preexisting identity, woman, for instance, but helped to form that very category. On this point, Haraway builds significantly on the then-unpublished works of Elizabeth Potter (later published as Potter 2001).

discussed in chapters 3 and 4. Like the modest witnesses of the 1660s or the sound scholars of the ontological turn, my interlocutors invest in a realist ontology in which sound as an external reality may be understood and analyzed without reference to any of its “representational” content (language musical meaning, etc.), through the aid of scientific methods and technologies. I want to suggest, then, that these interlocutors, and the conceptual frameworks they espouse, are caught up in the same epistemological commitments that support the white male priorities and dispositions that Stoever (2016b), Thompson (2017), Haraway (2018), and many others describe.¹¹

Perhaps the most intuitive example of my interlocutors’ “modest” orientation is the “art/science line,” discussed at length in chapter 4. The art/science line dramatizes a strict separation of the subjective and the objective, using scientific authority and technological instruments to objectify sound in space as an independent material “thing” amenable to quantitative measurement and control. Evoking the precisely the same kind of distinction as scholars who aim at studying sound as distinct from its signifying properties (M. Thompson 2017), Meyer’s art/science line can be interpreted as a distinction between the “cultural” (meaning, signification, representation, etc.) and the “ontological” (sound as a pre-representational material process). By segregating themselves in the “science” category that excludes subjective “arts,” individuals embracing the Meyer Sound philosophy, like the scholars critiqued by Thompson, seek to isolate sound from all manner of social or cultural entanglements (aesthetic judgments, discursive meanings, sign systems, affective moods, systems of

¹¹ For further critiques of the situatedness of supposedly neutral frameworks, see, from the perspective of sound, see Rodgers (2016); Goh (2017); Ingleton (2016); from science studies, see Harding (1992b, 1995, 2016a); Traweek (1992). For a first-rate decolonial intervention, see Wynter (2003).

representation, etc.). Embracing science, and its well-established epistemological and political authority, allows these actors to disregard subjective concerns, to defer all discussion of “identity,” and to assert what Sharon Traweek (1992) called a “culture of no culture” (162).

As in the rise of experimental science in the 17th century, the story of Meyer’s approach to sound reinforcement is centered around a technoscientific instrument. In Boyle’s case it was the air pump; to my interlocutors, it is the SIM analyzer. As Haraway (2018) and Shapin and Schaffer (2011) tell us, Boyle’s air pump “acquired the stunning power to establish matters of fact independent of the endless contentions of politics and religion” (Haraway 2018, 24). Similarly, in the Meyer story, the SIM analyzer is known by its users as the most objective path toward “what is really the reality” of sound (M. Reich, pers. comm., July 14, 2018), regardless of competing human interests like aesthetic beauty or subjective tastes and expectations. To the Meyer Sound community, the SIM machine is not just a product—a commodity—but a material encapsulation of their epistemological system. It provides the primary way of discussing and negotiating how a room and its technology sounds. It authorizes every claim.

Here is how Merlijn Van Veen, Senior Technical Support and Education Specialist, described the SIM analyzer to me:

I...refer to the [SIM] analyzer as an x-ray machine, that basically makes an x-ray photo of the sound system. And it takes a class in radiology to make sense out of that x-ray photo, out of the transfer function, which is basically data interpretation. And depending on how you interpretate the data, uh, you can connect the dots.... And I suppose that just like radiology, it takes, you know—you need to look at a lot of x-ray photos throughout your career to start feeling confident with performing the diagnosis. *And in my line of work, the analyzer has 100 percent authority.* (Van Veen, pers. comm., January 9, 2019).

Van Veen draws on a number of authorities in staking out a claim to scientific objectivity. First, he makes an analogy with a well-known piece of scientific equipment, the x-ray machine.

Importantly, this widely trusted instrument expresses data in a *visual* medium, another source of authority that, even for sound specialists, carries with it an assumption of objectivity often

privileged over the aural (about which more below). The third authority he cites resides in the *expertise* necessary for proper “data interpretation.”¹² Lastly, he places an overarching “100 percent authority” in the analyzer itself.

The domain of the visual provides the primary way to mediate between vibratory sound and human discourse. “As humans we are more visual,” Mauricio Ramirez told me. “We can connect everything with color, with bright[ness], with position, with space. But in *sound* it’s complicated, because we don’t see the sound” (pers. comm. June 26, 2018).¹³ Ramirez is by far the Meyer technician that most freely defends the role of the ears in calibrating systems.¹⁴ But despite his self-professed “old-school” approach that places more emphasis than most on listening than looking, Ramirez still insists on the fundamental objectivity of the visual—even if it has limitations (pers. comm., June 26, 2018). (There are certainly limitations to what SIM can quantify and visualize, which I will discuss more below.)

¹² Later in discussion, Van Veen kept the medical metaphor going by posing a rhetorical scenario: “If you have a broken leg and you go to the hospital and the doctor’s a freshman just out of university and says, okay, the leg has to come off. You want a second opinion?... You will insist that a more experienced person looks at the same set of x-ray photos...before you have your leg chopped off. And it’s the same with transfer functions.... You’d have to do see a lot of transfer functions to become skilled at seeing with confidence...” (pers. comm., January 9, 2019).

¹³ Ramirez also provided an involved visual metaphor for sound frequencies, making the analogy between different audible frequency ranges with different colors. He discussed how high frequency light is bluer, low frequency light is redder, with a bunch of different colors in between. All of this is well known in the physics of optics.

¹⁴ Recall, for example, the episode in chapter 4 in which Ramirez expressed the need to demonstrate José Gaudín, his immediate supervisor at the moment, that that implementing an exotic processing filter had improved the sound in the room. Ramirez was already satisfied by listening, but knew he needed visual data, from the analyzer, to “show the changes to Jose” (field notes, June 26, 2018). A year earlier, Gaudin told me a similar story, this with him as the one who needed to produce visual data. Before the 2017 wanted the Montreux Jazz Club to have a radically different sound system than in previous years. (This venue is built differently every year, in different places, with different walls, different sizes, and so forth.) The technical specifics are not as important as the general point: that Gaudin was asking Meyer Sound to pay for more speakers for a smaller area so that the sound could be improved. The system design philosophy Gaudin was following was not a standard one, so he faced resistance. As he told me, “you have to prove everything to these guys.” He then pulled out his computer and showed me a series of visual mathematical predictions about how well his proposed system would improve the sound. The point was that visual data was what was needed to settle Controversies about sound.

Bob McCarthy, who probably invented more techniques for scientifically analyzing live sound than anyone, gave me a particularly vivid description of how the visual reveals otherwise-unknowable data about sound:

I can put a microphone up in the room and measure the response here [*points*] and put another microphone there [*points*] and then tell you the difference [transfer function].... And...you can't deny it [the visual data]. It's sort of right there. Because it's sort of like when you see that first picture of, uh, of a bug on an electron microscope. You didn't realize, "Oh my god, it has all those features!" Well, that's what we've got, essentially. Acoustic instruments are almost on an electron microscope level—that we can see.... The basic analyzer I use [SIM 3] measures at 48th of an octave. So, take a piano key and split it into four parts. And so we're seeing it super fine, and people say, well, "why do you want to see it that fine?" (Bob McCarthy, pers. comm., December 13, 2018)

Like the x-ray machine cited by Van Veen above, McCarthy invokes another well-known scientific instrument to assert the SIM's authority and index its elite "high tech" nature. The reference to the electron microscope is particularly evocative, as it indexes a level of precision and exclusiveness far outside of the everyday life of any non-technician. Additionally, vision is invoked not only as objective—"you can't deny it.... It's sort of right there"—but as a window into aspects of sound that wouldn't be known without the machine ("Oh my god, it has all those features!"). The SIM machine, with its authoritative visual data and associated methods of making sense of its graphs (Van Veen's "data interpretation"), provides ways to understand and manipulate sound that is both precise and borderline magical.

McCarthy's vivid evocation of the power technoscience to measure and manipulate the natural world places him, and his cohorts, in the figurative role of "master decoder." In Donna Haraway's canonical essay "Situated Knowledges" (1988), the master decoder is the unmarked rational white man that deploys western technoscience to colonize the world through knowing and abstracting it. Vision is the primary mode of action.

The eyes have been used to signify a perverse capacity—honed to perfection in the history of science tied to militarism, capitalism, colonialism, and male supremacy—to distance the knowing subject from everybody and everything in the interests of unfettered

power.... The visualizing technologies are without apparent limit. The eye of any ordinary primate like us can be endlessly enhanced by sonography systems, magnetic resonance imaging, artificial intelligence-linked graphic manipulation systems, scanning electron microscopes, computed tomography scanners, color-enhancement techniques, satellite surveillance systems, home and office video display terminals, cameras for every purpose from filming the mucous membrane lining the gut cavity of a marine worm living in the vent gases on a fault between continental plates to mapping a planetary hemisphere elsewhere in the solar system. Vision in this technological feast becomes unregulated gluttony. (Haraway 1988, 581)

For Haraway, vision is the privileged modality by which the world is ordered and thus dominated in late modernity. The litany of probing instruments Haraway describes—including the electron microscope—are vivid depictions of how technoscience can colonize the most minute aspects of the natural world for the benefit of “Man,” while simultaneously reinforcing nonnormative figures (the woman, the racial other) as somehow deficient.

One of the primary epistemological tools of this visual colonization is what Haraway calls the “god trick,” which she famously describes as

a conquering gaze from nowhere. This is the gaze that mythically inscribes all the marked bodies, that makes the unmarked category claim the power to see and not be seen, to represent while escaping representation. This gaze signifies the unmarked positions of Man and White, one of the many nasty tones of the word “objectivity” to feminist ears in scientific and technological, late-industrial, militarized, racist, and male-dominant societies. (Haraway 1988, 581)

Here, the transparency of the “unmarked positions of Man and White” are at the center of a global epistemological and political order shrouded in western science and technology, while alternative ways of being and knowing are marginalized to “a finite point of view, and so an inevitably disqualifying and polluting bias” (575).¹⁵

¹⁵ Those denied entry into this privileged subjectivity are classified as “the embodied others, who are not allowed *not* to have a body” (Haraway 1988, 575).

Like the white male decoders of Haraway's "god trick," Meyer technicians, and their instruments, are meant to master sound through observing it while erasing their own presence from perception. The work of the systems and the work of the technicians, like that of Boyle's air pump and its modest witnesses, submits to the presumed reality of the true material nature of sound, accessible only to the "conquering gaze" (Haraway 1988) of the machine that tells "what is really the reality" (M. Reich, pers. comm., July 14, 2018). The tuning technicians themselves, whose work is mostly done long before the audience arrives, are socially silent and invisible (cf. on mixing engineers Slaten 2018), while they maintain a stunning power to shape the spatial environment long after they have gone.



Figure 5.1: Comparing "live" graphical measurements to saved "traces"

These technicians visualize sonic processes "on an electron microscope level" (B. McCarthy, pers. comm., December 13, 2018), and they do so with a "gaze from nowhere" (Haraway 1988) distanced and abstracted from the mechanical vibrations themselves—and certainly their discursive meaning or affective feeling. The analyzer and its associated network of processors, algorithms, wires, and microphones detaches the observer from the subjectively and intersubjectively lived experience of the sound (and, of course, that special subclass of sound known widely as music). The technician can view mathematical representations of mechanical vibrations from anywhere in the room. (Or even outside the room.) The machine can store measurements from minutes, hours, even years earlier, from locations anywhere in the room (or

elsewhere). And it can display them all on the screen at the same time. The analyzer can overlay these and other saved graphs with the “live traces” under measurement at any given moment (see Figure 5.1). It is through these squiggly lines that technicians most obviously enter into the vast lineage of white men who have deployed technoscience to control the natural world through representing it. These technicians stand outside the material and symbolic relations of sounding, on the other side of microphones, processors, computer screens, and, of course, the “art/science” line.

5.2.5. “The Machine Doesn’t Know”

Now, let me pause to emphasize that I make no claim that the Meyer Sound approach is *exclusively* contingent on the visual domain, even if the SIM’s visual display is the center of the governing philosophy and claims to authority. My interlocutors know better than virtually anyone that the analyzer does not see *everything* about sound, and that no processors or loudspeakers provide total control over the entire sound field. Quite the contrary. My interlocutors are the leading experts on what such technologies *cannot do* as much as what they can. These technicians certainly know that frequency response doesn’t encapsulate everything there is to know about the “tone” or “timbre” of sound signals. They recognize that tropes like “warmth,” “intimacy,” and “envelopment” may have quantitative correlates (e.g., frequency response, early delay time, lateral reflections), but they also know the critical limitations of such measures. So, while the shorthand of “more low frequencies” to describe warmth has its uses, and can be expressed visually in frequency response graphs, my interlocutors know that the real, subjectively lived phenomenon of warmth is much more complex, subjectively variable, and difficult to communicate. These are just a few examples. In short, my interlocutors know that

there are numberless aspects of the subjective experience of sound—or even its physical behavior—that they simply do not have access to with these tools,

My interlocutors also understand that the graphs they see on the screen mean little without a range of contextual information. As Martin Reich, Sound Coordinator for the Montreux Jazz Festival, put it,

We humans tend to listen with the ears and the eyes. And our emotions. So, this is something that the machine doesn't do.... The machine doesn't know if the microphone is in the right spot. And the machine doesn't know where the audience will be, and what the parameters around are. For example, will the floor be covered with humans, which means a lot of absorption from the floor reflections? ... Things like this the machine doesn't know, so it needs both. It needs the brain that understands what's going on, and it needs the machine that verifies—without any emotion, every day, with the same precision—what is really the reality. (M. Reich, pers. comm., July 14, 2018)

The contingencies are nearly endless, but these technicians are greatly skilled at negotiating them. Tuning rooms is a perfect example of the “ontologically entangled authorship” of facts (Haraway 2018, xix). That is, knowledge is co-produced between humans and nonhumans rather than as a simple and transparent reporting of whatever the machine “says” (Shapin and Schaffer 2011, 17). Indeed, as I showed in chapter 4, my interlocutors regularly negotiate a complex array of materialities realities irreducible to graphs on a screen. Room tuning is a messy affair, and it defies the epistemological tidiness evoked by metaphors like x-ray machines and electron microscopes.

Though this more epistemologically diverse model of knowledge production *seems* quite different than the “gaze from nowhere” of the white male witness to science (Haraway 1988, 2018), or the disinterested ear of white aurality (M. Thompson 2017), this messiness doesn't substantively affect my claims. Despite my interlocutors' knowledge that the analyzer shows less than the full picture, they are also aware, in the accepted style of western science, that in the carefully delineated *subset* of reality that they have staked out to measure, objectivity may be

maintained. For example, while frequency amplitude response surely doesn't tell the whole story about sound, and certainly about how it is perceived by different people, it does accurately index *something* about the sound: that is, to embrace tautology, the frequency amplitude response. Though the concept is certainly culturally specific, it is still generally coherent, measurable, and translatable. And even if this and other "scientific" concepts are submitted to all kinds of practical and embodied contingencies, there are still core scientific frameworks that my interlocutors can intelligibly evoke to claim epistemological authority.

Besides, as Haraway and Shapin and Schaffer explore (among many others), the kinds of practical contingencies I exposed in sound system tuning have been commonly found in the natural sciences since their very beginnings.¹⁶ What matters most for the present argument is not the way knowledge about sound is actually negotiated (that was more important in chapter 4). Instead, what matters is how my interlocutors' approaches to sound are embedded within systems of epistemological authority that have been, throughout their history, articulated with white, male, colonial, capitalist subjects and interests. To simply assume this *orientation* toward sound as a quantifiable, controllable, and ultimately dominatable material entity is to align with the same forces as the white male "master decoder" (Haraway 1988, 581).

¹⁶ There is solid literature on the laboratory practices of producing knowledge that support my hunch. The most famous exploration of the "ontologically entangled" (Haraway 2018, xix) mode of knowledge production" might be Latour and Woolgar's (2013) ethnography of the Salk Institute, *Laboratory Life*, first published in 1979. Other important science studies work dealing with the production of scientific knowledge through the interaction of technological instruments, modes of representation (mostly visual), and embodied practices include Latour (1987), Traweek (1992), Suchman (2007), Knorr-Cetina (1999), Lynch (1985), Kohler (2002); Collins (1974, 1992, 1998). There have been plenty of studies that show such a phenomenon for such instruments as door closers (Latour 1992), particle physics equipment (Traweek 1992; Knorr-Cetina 1999), space shuttles (Vaughan 1996), even refrigerators (Cowan 1985) and bicycles (Pinch and Bijker 1984). Influential anthologies include Bijker, Hughes, and Pinch (2012); MacKenzie and Wajcman (1985).

5.3. Part 2: Black Sound, Abstract Space, and the White Spatial Imaginary: Under the Bridge and Above the City

Turning now to the second half of this chapter, I shift from focusing on auditory whiteness as a matter of epistemology, subjectivity, and science to a discussion of whiteness as a matter of sound, space, and political economy. I draw connections between the approaches to sound and technology discussed in earlier chapters and a concept George Lipsitz (2011) calls the “white spatial imaginary.” According to Lipsitz, the white spatial imaginary “idealizes ‘pure’ and homogeneous spaces, controlled environments, and predictable patterns of design and behavior.” (29). It is about sameness, codification, and, in a word, transparency. On the other hand, Lipsitz outlines an opposing Black spatial imaginary that emphasizes participatory interaction, shared community engagement, mobility, and the creative use of public spaces. Such engagements with space, to Lipsitz, are inherently emancipatory engagements, finding their most elegant manifestations in Black expressive culture, including jazz, which he dubs “a living archive of oppositional consciousness and thought” (19).

Especially important is how the white spatial imaginary’s emphasis on control and predictability is deployed in service of capitalist formations that disproportionately serve the material interests of whites. According to Lipsitz, such spaces favor “possessive individualism and competitive consumer citizenship” over community participation and cultural diversity—in short, the white spatial imaginary privileges “profits over people” (19). Lipsitz states: “The white spatial imaginary views space primarily as a locus for the generation of exchange value” (30). On the other hand, the black spatial imaginary “oppose[s] the land use philosophy that privileges profits over people and instead to create[s] new ‘use values’ in places that have little ‘exchange value’ (19). In other words, rather than orienting spatial practice around profit and capital—constructing space as a facilitator of the market—the Black spatial imaginary focuses more on

creative uses of public spaces for human enrichment and enjoyment, community expression and assertion, and other “local” purposes organic to individuals and communities themselves.

My aim in the next pages is to outline how JALC’s deployment of sound and sound technology exhibits key characteristics of the white spatial imaginary and attenuates some aspects of the Black spatial imaginary that have long been associated with jazz and other Afro-diasporic forms. Consequently, I contend, by presenting the sound of jazz the way JALC does, it lessens jazz’s potential for “oppositional consciousness and thought.”¹⁷

5.3.1. Whiteness as Orientation

I take guidance in this section from Sara Ahmed’s (2007) proposal of whiteness as a phenomenological *orientation*. To Ahmed, whiteness is not a question of ideological codes or definitions of identity or personhood, but a range of habitually sedimented, collective *orientations* of bodies, histories, and expectations. Among other things, these inherited orientations condition how easily different bodies may occupy certain spatial locations and social positions: “Whiteness is an orientation that puts certain things within reach” (Ahmed 2007, 154). According to Ahmed, “whiteness becomes a social and bodily orientation given that some bodies will be more at home in a world that is orientated around whiteness” (160). These spatial orientations “take shape through the habitual actions of bodies, such that the contours of space could be described as habitual.... Spaces acquire the shape of the bodies that ‘inhabit’ them”

¹⁷ Similar claims be even easier to make and evidence in the MJF case, so much so making such claims would be significantly less enlightening. The reason is that there isn’t any really any problematic tension at all. That is, unlike JALC, the discourse of jazz as politically oppositional, or even jazz as an African American expressive practice, is so remote that my argument about sounds ability to attenuate such an energy becomes moot. Put differently, while I am describing what I find at JALC as an *attenuation* of Black “ethnocentric energy” (Ramsey 2003) and oppositional potential, at MJF I would be talking about an almost complete *non-presence* of any such energies or potentials.

(156). Some bodies get more “stressed” (156) upon entering certain spaces that have inherited the orientations of whiteness, while the presence of white bodies “goes unnoticed” (156).

In what follows, my sonic riff on Lipsitz’s white spatial imaginary doesn’t strictly enforce codified restrictions on people of color, or on associated sounds or cultural signifiers. Instead, as in Ahmed’s phenomenology of whiteness, the white spatial imaginary places differential frictions—what Ruth Wilson Gilmore (2002) calls “disproportionate costs of participating” (17)—on marked bodies, practices, and modes of knowing and being. I extend Ahmed’s thinking by attending to the role of sound technology in *orienting* the sonic environment such that certain sounds, and thus certain bodies, become “more at home” than others.¹⁸ One effective way to get a sense of this dynamic is to think about some sounds that would *not* feel “at home” at JALC, sounds that clearly fall in line with Lipsitz’s Black spatial imaginary.

5.3.2. “Under the Bridge”

In the 2010 article, “‘Under the Bridge’: An Orientation to Soundscapes in New Orleans,” Matt Sakakeeny ethnographically observes a New Orleans jazz funeral and second line parade as it proceeds through different neighborhoods, passing and pausing at various local “sound marks” (the sonic correlate to “landmarks,” as proposed by Schafer 1994). Sakakeeny analyzes the parade as a mode of sonic reclamation, resistance, and celebration by a community of mostly Black participants (musicians, dancers, local community members). Sakakeeny highlights how the mobility of the event orients participants to the changing soundscape as the

¹⁸ In the more political economic language of geographer Ruth Gilmore Wilson, the spatial functioning of racism is “a limiting force that pushes disproportionate costs of participating” in white worlds upon marked subjects and groups. Such racially marked people are burdened with the “frictions of political distance” (2002, 17).

group progresses through different aural environments, while participants' voices and instrumental sounds join with the reverberations of the built environment in a collective expression of shared relations of locality, class, and racial/ethnic experience.

A particular focus of the narrative occurs when the parade pauses below an overpass formed by the controversial Interstate 10, a monument to segregation and mid-20th-century urban planning and "white flight." The interstate, planned and built at a transitional moment between formal Jim Crow segregation and the more concealed regimes of spatial racism that followed, sliced directly through the Tremé, one of the city's oldest and most culturally significant black neighborhoods. Like so many other urban planning projects, Interstate 10 cloaked itself in the discourse of colorblind capitalist progress to deflect attention away from its real material effects: encouraging middle-class whites to flee the city for the suburbs, concentrating Blacks and other minority populations in inner-city neighborhoods, and worsening such neighborhoods' access to the city's sources of economic production (among many other things).

As the parade progresses, it lingers under this interstate overpass.

The "bridge" creates intimacy, enclosing parade participants, maximizing a sense of unity, and the concrete makes for spectacular acoustics, amplifying and multiplying the participatory sound, creating a sort of "unplugged" feedback loop; acoustic, but shockingly loud, and made louder by the musicians playing at peak volume to compete with the sound of cars and trucks whizzing by above. Ideally, the sounds of the music, the crowd and the environment work together to orient individuals as a collective occupying a shared space. (Sakakeeny 2010, 2–3)

Importantly, Sakakeeny claims that the participants draw on a network of Black cultural practices: "parade participants in New Orleans 'speak' through practices linked to black

expressive culture: bodily engagement, crowd participation, musical call and response, improvisation, and rhythmic syncopation and repetition” (13).¹⁹

Such approaches to occupying public space with sound, Sakakeeny argues, are modes of reclamation. By coming together to create “joyful noise” (19), parade participants engage in an oppositional politics that confronts the otherwise rationalized, ordered ideals conducive to whiteness and capital. As Sakakeeny documents, such sounds, like many others associated with Black people and neighborhoods, are racially coded as discordant with white tastes and economic interests, and they are continuously policed, both formally and informally (neighborhood associations attempting to crack down on “noise,” aggressive policing tactics against black-owned music venues, etc.).

With this background, the jazz parade’s loud overlapping of Black “joyful noise” (19) is a powerful oppositional assertion: “Occupying the contested inner-city streets of New Orleans through black cultural practices transforms abstract to concrete space, and articulates a ‘right to the city’” (17).²⁰ Here Sakakeeny is invoking noted Marxist philosopher and geographer Henri Lefebvre and his important concept of “abstract space,” which I want to spend some time focusing on. In Sakakeeny’s gloss, abstract space is “bureaucratically shaped space” (17), which is opposed by a more emancipatory mode of human spatial practice: “lived space.”

¹⁹ While Sakakeeny argues for “multiple orientations to black culture” (23), this core typology of Black cultural practices holds up throughout his article.

²⁰ I say “glossed” because, like most people who discuss Lefebvre, Sakakeeny misses one of Lefebvre’s key points: that his different forms of space are not meant to be pure oppositions.

5.3.3. Abstract Space and the Illusion of Transparency

In the original Lefebvre, abstract space is “the space of scientists, planners, urbanists, technocratic subdividers and social engineers, and of a certain type of artist with a scientific bent” (1991, 38). It comes into existence through systems of codes and sign systems that define and delimit space for the smooth operation of political economy. Abstract space conceals its power to dominate through what Lefebvre calls an “illusion of transparency” (27). Lefebvre uses this term to describe how the capitalist mode of production makes clandestine use of “objective” representations of space to reinforce unequal structures of power. Capitalism, Lefebvre says, proffers “a view of space as innocent, as free of traps or secret places” (28). While Lefebvre is unconcerned with the issue of race, many other writers, like Sakakeeny, have picked up on the resonance of Lefebvre’s concept with the politics of whiteness.

Geographer Katherine McKittrick brings the idea of transparent space directly into the problematic of race and Blackness.

While transparent space is a view, or perspective (what we see is knowable, readily decipherable), governing social desires continually bolster its seemingly self-evident characteristics: particular local and global mappings, infrastructures, regional boundaries, and transportation routes are examples of how transparent space, seemingly innocent, is materialized in the geographic environment. Prevailing spatial organization gives a coherency and rationality to uneven geographic processes and arrangements: a city plan, for example, can (and often does) reiterate social class distinctions, race and gender segregation, and (in)accessibility to and from specific districts; the flows of money, spaces, infrastructure, and people are uneven, in that the built environment privileges, and therefore mirrors, white, heterosexual, capitalist, and patriarchal geopolitical needs. (McKittrick 2006, 6)

Here McKittrick explains how “transparent space” is deployed to constrain subaltern populations while serving the needs of the colonial subjectivities of “the west” (whiteness, heterosexuality, capitalism, etc.). For example, returning briefly to Sakakeeny’s example, upon its design in the 1960s Interstate 10 was presented by planners as an abstract and disinterested solution to address the flow of capital and putatively race-neutral questions of human transportation. The interstate

was thus, in McKittrick's words, "seemingly innocent," while it served the interests of the whites in power by reinforcing race-based segregation within a discourse of race-neutral "development."²¹ From the "disinterested" perspective of abstract space, absent the subjective experience of local dwelling and community values, slicing a historic neighborhood seemed, like whiteness itself, entirely "normal and right" (Bonilla-Silva, Goar, and Embrick 2006, 231). But it was reinforcing segregation and inequality. It was ensuring that "flows of money, spaces, infrastructure, and people are uneven" (McKittrick 2006, 6) and predominantly in service to the hegemony of whiteness (and whiteness's companions: maleness, heterosexuality, capitalism, global patriarchy).

5.4. Jazz Venues, Transparency, Exchange Value, and Whiteness

I now wish to draw connections between McKittrick's transparent space, Lipsitz's white spatial imaginary, and the way sound is deployed at JALC. The most conspicuous connection is how JALC's acoustics, sound insulation, and sound reinforcement, which emphasizes evenness of coverage and uniformity of aural experience, align closely with the white spatial imaginary's emphasize on the "homogenous," "controlled," and "predictable" orientations (Lipsitz 2011, 29). Later I will pick up on another connection intersecting both Lipsitz and McKittrick: how the sonic environments produced through JALC's sound systems favor exchange value over use value, and thus a political economy that reinforces the racially stratified status quo. First, let us linger on the ideas of control, evenness, predictability, and balance.

²¹ The literature on urban planning and infrastructure (highways especially) as material instantiations of structural racism is vast. See, e.g., Zipp (2009, 2010), Schwartz (1993), Winner (1980), Caro (1974), Gregory (1998, 2020).

The uneasy intersections of such sonic qualities with the white spatial imaginary are exemplified by how poorly such an overall environment would fit the kind of sonic production described by Sakakeeny. For it is inconceivable to imagine the kind of “joyful noise” noted by Sakakeeny in New Orleans brass band parades having nearly the same resonance in one of JALC’s rooms as in its original “under the bridge” context. For Sakakeeny, the urban environment itself contributed to a vibrant, high-energy acoustic soundscape, “amplifying and multiplying the participatory sound, creating a sort of ‘unplugged’ feedback loop; acoustic, but shockingly loud, and made louder by the musicians playing at peak volume to compete with the sound of cars and trucks whizzing by above” (Sakakeeny 2010, 3). Though we find some of these ideals at JALC—intimacy, participatory sounding, interaction between musicians and non-musicians²²—the kind of raw loudness and “feedback” Sakakeeny describes is entirely discordant to the overall JALC sound ideal.

Not only would such sounds seem to go against the overall aesthetic *ideals* of these rooms—especially the desire for quiet isolation from the outside world and its social entanglements (chapter 2)—but such a soundscape simply could not happen within JALC’s walls. For there will never be a competition with cars or trucks within any of JALC’s sequestered rooms. There will never be a sonic confrontation between environmental and musical sound. In fact, as discussed at length in chapter 2, strict segregation from the outside city is one of the primary ways the JALC exerts its aesthetic of purity and social transcendence.

Put simply, JALC’s “pure and clean” environments favor “pure and clean” music. And while such an acoustic space certainly suits Marsalis’s vision of jazz as an intricate musical form

²² Also, as discussed in chapter 1, though these *ideals* are taken seriously by JALC leadership, its staff, and some patrons, most concerts don’t exhibit them conspicuously.

in which details and subtleties matter (a very western view of “art”), it doesn’t mesh so well with many other forms of jazz (and other US Black musics) that are less invested in the kind of musical details desired at JALC, and for which “natural” concert hall acoustics carries little value. For example, as earlier chapters have showed, JALC puts extensive effort into fostering a range of culturally specific sound ideals in their rooms, including (1) a reverberant “golden sound” evocative of the classical concert halls but tuned to the perceived needs of a jazz big band (chapter 1); (2) full sonic and social isolation from the outside world (chapter 2); and (3) transparent sound reinforcement that reproduces the finest “natural” details like the finger articulation of an acoustic bass (chapter 3). All this, and much more, makes for a controlled and contemplative environment appropriate for groups like the Jazz at Lincoln Center Orchestra. But it makes little sense for, say, the brass band parades discussed by Sakakeeny, where an acoustic bass wouldn’t be heard at all, and where the entire point is to engage with the urban soundscape that JALC so definitively quarantines itself from.

The brass band example is important, for the creative use of public space, and especially *the street*, are crucial backbones of the Black spatial imaginary. Indeed, Lipsitz (2011) discusses early-twentieth-century jazz parades as canonical expressions of the Black spatial imaginary, describing them—along with other outdoor jazz occasions like picnics and lawn parties—as “democratic spaces for cultural production, distribution, and reception” (63). Lipsitz specifically contrasts such egalitarian tendencies with the prohibitive costs, social exclusion, and physical limitations of interior spaces like concert halls and even nightclubs, which were subject to the private interests of ownership (cf. Ogren 1989). For Lipsitz, the parades of this era were both politically transgressive and communally affirmative, allowing people to use public spaces “to create new social relations among themselves” (62). And, by enabling Black bodies to enter

neighborhoods otherwise hostile to them, parades mobilized the Black spatial imaginary's capacity to reshape the racial geography of the city.

Beyond parades, Lipsitz cites everything from hip-hop imagery (graffiti, street murals) and breakdancing to New Orleans street parades, street preachers, and Civil Rights marches (60, 61–64, 65, 17–18). Lipsitz even describes Harlem's Jazzmobile as an ideal expression of the Black spatial imaginary, focusing specifically on its mobility and occupation of the urban built environment—how it “turned the streets of Harlem into a performance space by placing jazz ensembles on flatbed trucks” (65).

Sociologist Herman Gray (2005) implicates JALC and Wynton Marsalis in a similar story. Though Gray supports certain aspects of the Marsalis/JALC project, namely how it serves as “an oppositional cultural strategy by African Americans engaged in struggles for institutional legitimacy and recognition” (43), he also expresses misgivings about how JALC's “fundamentally conservative” posture is both “culturally and politically conventional and elitist” (47). On this point, Gray distinguishes between the “abstracted, codified, and preserved” (49) institutional world of JALC and a more dynamic and “transgressive” cultural strategy found in the “the metaphor of the road and the street” (53). The street, to Gray, emphasizes movement, change, community-based action, and a politically assertive Black consciousness—very much in the mold of Lipsitz's Black spatial imaginary.²³ Gray derives his metaphor from mid-twentieth-century touring circuits and urban performance networks, which he posits as spaces in which urban Black communities have negotiated key ideas about music and social life, developing a dynamic set of “cultural styles” (53) that resist assimilation and codification. To Gray, JALC

²³ Lipsitz, in fact, cites Gray's discussion as an example (2011, 64).

forestalls jazz's innovative and transgressive potential by symbolically separating the music from street-based tradition (see also Porter 2002; G. E. Lewis 2004). I build on this point in my conclusion.

For now, I want to connect Gray's, Lipsitz's, and Sakakeeny's evocations of "the street" as an aesthetic and political formation to the way *sound* is practiced within JALC's performance spaces. My basic observation is this: while the "pure and clean" sonic ideal I have been discussing is indeed oriented around a particular "sound of jazz," the specific kinds of jazz that are made to feel "at home" in these rooms contrast distinctly with the street-oriented aesthetics discussed by Sakakeeny, Lipsitz, and Gray.

The point is not to say that JALC's ideals are subverted or corrupted, at least not completely. But it is to say that the way sound is mediated, in conjunction with a range of other articulations with whiteness, profoundly affects the types of sounds and meanings that can be reproduced legibly in these spaces. And as I elaborate later, the ways sound is conditioned can have attenuating effects on jazz's capacity to contribute to oppositional Black cultural projects.

5.4.1. "They Make Money on Us": Value Engineering and the Exchange Value of Sound

Another way that JALC aligns with Lipsitz's white spatial imaginary is the recruitment of sound into the capitalist logics of exchange. This enlistment is most intuitively grasped through the idea of *versatility*—using sound technology to accommodate as many income-producing sonic productions as possible. The basic mechanism is simple: neutral, transparent sonic environment can be effectively used for a wider spectrum of sounds: not just music but spoken word (corporate meetings, etc.), film, dance, television shows, and all manner of other rental productions that are found in JALC's rooms at a higher frequency than jazz. Indeed, concealed

behind the “specifically for the sound of jazz” rhetoric (which, again, has been embraced sincerely), there is also a powerful philosophy of multiuse functionality. As Damian Doria, the project manager of the JALC design team, stated when the facility first opened, “Every room and space...must serve not only jazz and jazz education, but a wide variety of functions and performing-arts functions. As a result, the design team ensured that each room in the facility was a multifunctional space, ready to accommodate classroom instruction, corporate meetings, parties, recording sessions and performance” (2005, 47).

From a sound system perspective, the ability to host such an array of events is tied to the same aural and epistemological ideals of transparency, neutrality, and scientific control that I discussed in the first half of this chapter. In other words, JALC’s multiplex enmeshments with the question of exchange value—some of which I discuss below—are inseparable from the posture of abstracting and controlling sound with scientific methods and technologies immersed in the “modest white aurality” discussed above.

It doesn’t make a difference that JALC is a non-profit organization: it still must follow the same economic forces as any other organization exposed to the market. David Gibson, Head Sound Engineer at JALC’s Rose Theater, told me how, when the facility was still being planned, the building committee hired the global consulting firm McKinsey & Company. The firm “was asked what it’s gonna take to be financially solid. So, they just did the numbers: ticket sales are this much, how many shows you have to have, what’s the building operations cost.” The company tracked every potential inflow and outflow, producing all manner of financial projections. According to Gibson, the study concluded that, between official JALC concerts and

rentals,²⁴ they would need a 95 percent booking rate to stay afloat. Such a booking rate is impossible, as Gibson emphasized: “Even if you had a show in here every night, you’re *still* not gonna be 95 percent.” Such a rate would mean no rehearsal days, no maintenance days, no holiday breaks, and no set-up and break-down time.²⁵ “Nobody breaks even on a building like this,” according to Gibson. “You can’t ever make any money in this room selling tickets. It always has to be underwritten” (D. Gibson, pers. comm., April 9, 2019).²⁶

To stay solvent, JALC has required a combination of better-than-expected fundraising and a concerted effort to make money off rentals. For one thing, as Gibson told me, “they make money on us,” meaning the cost of labor billed to the client is higher than the actual cost. JALC also adds to their revenue by charging rental clients for the use of equipment, including audio technology:

They nickel and dime you. They make you pay for every—every cable, every microphone. They’re packaged, right. So, they make you buy the full 200. You want the sound system? You turn on the sound system [and you have to pay]. And I think there’s a threshold of 10 microphones, then that’s another price. Small sound system [is one price], large sound system [is another]. They charge for the platforms. They charge for the soft

²⁴ Rentals include non-JALC Lincoln Center “favored nations” bookings (Lincoln Center constituents, like the Chamber Music Society or New York City Opera, who must pay full rental rates but get right of first refusal on dates), as well as outside “corporate” rentals. In this community, *all* outside rentals—any “people we don’t know,” as Gibson put it—whether they’re operas or stockholder meetings, can be called “corporates.”

²⁵ Even concerts, which are among the simplest things to set up for at a venue like this, often require load-ins on a separate day (or sometimes more).

²⁶ Bob McCarthy put it another way when he was addressing a collection of sound consultants that were considering purchasing Meyer gear: “Every symphony hall also has to do James Taylor concerts ... to actually make some money.” “Rock and Roll,” Bob McCarthy went on to say, “actually subsidizes the symphony.” The Appel Room, where non-jazz events outnumber jazz concerts by a wide margin, is a textbook case. Far more common than jazz concerts are dinner parties, business conferences, fundraising galas, awards shows, and other non-jazz musical programming—not to mention technical demonstrations for audio professionals, of which there is always a steady stream (J. Uhl, pers. comm., January 27, 2017). Since 2015, JALC has had a close business relationship with Meyer Sound, the details of which were given to me by Doug Hosney, Steve Ellison, and Helen Meyer but with the tacit (and sometimes explicit) understanding that they would not be shared widely. Suffice it to say that JALC is a “showcase” venue for Meyer Sound, and part of the relationship includes JALC providing access for Meyer Sound to do technological demonstrations for potential customers. See the introduction to this dissertation.

goods. They charge for the lights. They charge for everything. They charge for the power tie-ins if you bring your *own* lights.

It is difficult to imagine a more direct illustration of the logic of exchange value than imposing fees on using microphones, audio cables, and simply turning on the sound systems—not to mention the labor required to do any of this.²⁷ In these rooms, every decision, whether it concerns sound or anything else, is submitted to the pressures of the market.

Another striking illustration of the way JALC literally—that is, as a *word*—recruits “jazz” into the logic of capital was revealed to me by Doug Hosney. He explained how, as an organization, JALC distinguishes between “little j jazz,” the musical genre, and “Big J Jazz,” the institution of Jazz at Lincoln Center. This discursive twist—shifting from a notion of “jazz” as a signifier of musical genre to the notion of “Jazz” as an institution—is key to understanding how deeply jazz as a music has been made inseparable from the forces of market capitalism.

TW: So that’s “Big J Jazz”?

DH: So “Big J Jazz” is bigger than “little J jazz”—at least more styles are included in it. So “little j jazz” is certain types of music that’s incredibly hard to define, but “Big J Jazz” is kind of a mission. As an institution, it is a mission that’s wider than the music.... Which is to make “little J jazz” available at the highest level that we can—to increase the audience, through teaching people about it, advocating it, and playing it.

TW: But also, it sort of includes this collaborative spirit—

DH: Well, part of the way this facility works...is that in addition to all the things that Jazz—Big J Jazz, Jazz the organization—books and presents in here [official JALC concerts], you make the spaces available to other producers and groups who want to use it.... The resources from them, the funds from them, feed Jazz the institution, and are helping to maintain the space. Pay for the lights. Cleaning the various things that you have to do to take care of the building. So, on that level, those rental events, the more that we have them, the more groups that want to be here, means that we are offsetting the costs that Jazz would have pay—that Jazz *the organization* would have to pay—if that wasn’t here. The costs instantly [add up]. It’s a hell of a view! It’s an expensive joint! We’re on the corner of 60th and Broadway in New York City. It’s as steep as it gets.

²⁷ I literally mean “required.” No one is allowed to touch any of this equipment unless they are paid union workers. If a renter wants to use any sound technology, they have to pay union workers.

In the passage, Hosney clearly outlines how rental income provides a mediating link between the two types of J/jazz in the JALC universe: rental income “feeds Jazz the organization” which feeds jazz the music.

5.5. “To Dance and Sing”: The JALC Contradiction

JALC’s evocative rhetorical distinction between “Jazz” and “jazz” provides a useful entry point for a discussion of some important analytical and political dissonances that this discussion brings forth. A particularly relevant contradiction emerges in my linking the white spatial imaginary to an institution that has pointedly and vocally promoted Black expressive culture and values. Indeed, JALC is one of the most successful examples of an avowedly Black-oriented cultural institution firmly establishing itself amongst the elite of the institutional art world (see Gray 2005).²⁸ As has been widely discussed, JALC’s central ideological intervention—associated famously with such figures as the Marsalis, Stanley Crouch, Albert Murray, and Ralph Ellison—proposes Black culture not only as a legitimate *part* of US culture, but as an agent of leadership.²⁹

Further complicating my argument, JALC often promotes black culture in ways comparable to those Lipsitz (2011) finds emancipatory and “oppositional” (19). The most obvious examples include Marsalis’s oft-uttered promotion of ideas like “the blues,” “swing,”

²⁸ Even Amiri Baraka, perhaps the most well-known proponent of the “black radical” political potential of more avant-grade forms of US Black music (e.g., Jones 1963, 1967a; cf. Ellison 1995a), has expressed muted approval of JALC (e.g., Baraka 2009).

²⁹ Eric Porter describes this intervention as “transforming black nationalism into a kind of American exceptionalism with a Negro core,” which “radically challenges the marginalization of black people from American experience” (2002, 326). Marsalis’s intellectual cohort has rejected more assertive articulations of black nationalism, aligning with much of the backlash against the emancipatory politics of the 1960s and 1970s. They have thus focused on presenting positive examples of Black culture, while decrying what they feel are more destructive currents (especially hip-hop and other popular musics). In this way, they challenge what Murray (1970) called the focused on asserting a sophisticated vision of Black culture to remedy “the fakelore of black pathology” (38).

and “improvisation” as master tropes for both musical expression and social life. All of these are posited as both specifically African American and more broadly central to mainstream US cultural. In these tropes, Marsalis and his cohorts promote ideals of participatory interaction, ritualistic functionality, communal action, vernacular expression, dignity in the face of challenge, and cooperation within conflict, among others (see Murray 1976; Marsalis 1986; Scherman 1995; Gray 2005; Porter 2002).

Even in JALC’s architectural design, one finds conspicuous metaphors of heterogeneity, use value, sonic/social negotiation, and other hallmarks of Lipsitz’s Black spatial imaginary. Consider Marsalis’s “The Ten Fundamentals of the House of Swing,” an internal set of guidelines that oriented the whole design product.³⁰ In the document, Marsalis (1998) writes: “The entire facility is the House of Swing.... We want all 100,000 square feet to be well coordinated, to dance and sing, to be syncopated and unpredictable, but not eccentric.... We view all of the spaces together like members of a family and care should be taken with the personality of each space.” Some of Marsalis’s most figurative language is found in his discussion of the Appel Room:

This room should have the feeling of a street parade, a night of dancing under the stars, and an ancient Greek theater. Like a jazz parade, there should be a question of where the band ends and the audience begins. Of great importance to the character of this room will be the floor. It’s got to be a floor that you talk about, with a design extending on to the stage and all around, a feeling that is completely new but also antique—like the sound of Louis Armstrong. This space has got to invite people into the sound of the band and inspire them to dance, participate and be romantic. The room should feel like Duke

³⁰ This document has been reported as fundamental to the whole design and construction of JALC facility by Jacobson (2001) and Marsalis and Stewart (2012), and I can confirm this from numerous interviews and offhand comments (see especially D. Doria, pers. comm., April 4, 2019; C. Darland, pers. comm., March 20, 2019; E. Arenius, pers. comm., March 20, 2019). Jacobson (2001) reports that Marsalis keeps a framed copy in his apartment. An edited and abbreviated version is reproduced in Marsalis and Stewart (2012, 88). The document was kindly provided to me, with approval of the JALC board, by Doug Hosney.

Ellington's Orchestra—sensuous, spicy and able to accommodate all tempos. (Marsalis 1998)

Together, these quotes dramatize many of the tropes Lipsitz associates with the Black spatial imaginary—group participation, syncopation, coordination, unpredictability, improvisation—all of which have distinct musical and social resonances. Marsalis's ideas overlap significantly with Lipsitz's notions of interaction, heterogeneity, and collective cultural vitality through negotiated conflict and agreement.

I do not deny the sincerity of these words, nor the attempts by designers to encode these ideals materially into the facility's architecture and sound systems. In fact, members of the design team took such directives *very seriously*, putting considerable effort into interpreting them honestly.³¹

A reasonable interpretation might be that JALC has carved aspects of the Black spatial imaginary into the “jazz steel” of the facility (see chapter 1). In this interpretation, the rooms become “archives,” as Lipsitz says (2011, 19), of Black cultural values and modes of thinking and being. From a certain perspective, I endorse this interpretation. As discussed in chapter 1, there are very real and material ways that the rooms *were* in fact made to “dance and sing,” and, in many ways, they do so in ways aligned with a matrix of Black expressive practices (call and response, interaction, intimacy, complexity of overlapping voices). In a world in which prestigious concert halls have always prioritized specifically western modes of sounding and consuming sound, JALC's facility is a remarkable accomplishment. This is true no matter how subtle the accommodations to the “specifically for jazz” sonic aesthetic may be.

³¹ See, e.g., Wynton Marsalis (pers. comm., April 13, 2019); Edward Arenius (pers. comm., March 20, 2019); Chris Darland (pers. comm., March 20, 2019); Damian Doria (pers. comm., April 8, 2019); Sam Berkow (pers. comm., February 26, 2019); Rob Gibson (pers. comm., May 6, 2019); David Gibson (pers. comm., April 4, 2019).

But I also want to complicate this story. I want to bring forth an understanding of how sound in these rooms is rarely if ever “like a jazz parade,” as Marsalis stated above—or at least not like the parades described by Sakakeeny or Lipsitz. Instead, I suggest that something crucial changes when the typically participatory modes of sounding that Marsalis, Sakakeeny, and many others associate with a shared matrix of Black cultural expression are conditioned through the regimes of technological mediation I’ve been discussing. While these “pure and clean” technological regimes don’t strictly foreclose the oppositional or emancipatory potential of the Black spatial imaginary, they do create important, if largely covert, conditions on the sounds and ideas flowing through these spaces. Recalling Sara Ahmed, I suggest that that the rationalized, highly controlled sonic environments in JALC’s rooms shape and orient “the contours of space” so that some sounds, like some bodies, are more “at home” (2007, 156). While sometimes those sounds align with the priorities of the Black spatial imaginary—at least tentatively, as in the case of a JLCO concert (see chapter 1)—often they do not.

As I also showed in chapter 1, some sounds, such as Marcus Miller’s electric ensemble, encounter resistance. For the Marcus Miller concert described in chapter 1, the room didn’t “respond well” to the high-energy, electric sounds of the band (D. Gibson, pers. comm., March 29, 2019). The way the room sonic environment effectively “pushed back” against these sounds exemplifies Ahmed’s assertion that “spaces oriented around whiteness” place resistances—or in McKittrick’s terms, “disproportionate costs”—on the bodies that are not meant to feel “at home.” Above, I also discussed a similar example, the contemporary New Orleans parade as described by Sakakeeny, which contrasts starkly with the quiet and controlled sonic aesthetic at JALC. Many other sonic productions simply wouldn’t fit, including musical forms and styles that have

been objects of derision by Marsalis—most notably hip-hop, but also many forms of popular musics associated with Black musical culture.³²

It is thus implausible to consider these rooms primarily as mediators of a coherent Black spatial imaginary. Indeed, from the perspective of sound and sound technology, this chapter has revealed an array of ways that whiteness—as a matter of aurality, epistemology, and spatiality—holds considerable structural and phenomenological influence in JALC’s performance spaces. It thus makes more sense to interpret JALC’s sonic-spatial politics as a more modest insertion of Black cultural priorities within a wider framework of western-style universalism. It is this transparent, unmarked, and highly regulated mode of understanding and perceiving sound and space that provides the main “background to experience” (Ahmed 2007, 150). Here, only *certain* kinds of jazz—ones widely interpreted as both musically and politically conservative—are made entirely “at home,” and only to the extent that such sounds do not disturb the overarching background whiteness that permeates this and virtually any other art-world institutional space in the US and beyond.

By embracing a conception of sound as objectively knowable and controllable, JALC is immersed in the wider western history of white aurality and scientific thought that is simultaneously hegemonic, particular, and imperceptible (M. Thompson 2017; Haraway 2018; Stoeber 2016b). Further, by disciplining sonic environments as sonically homogenous, rationalized, transparent, and isolated from public space and social life, JALC espouses aspects of the white spatial imaginary.

³² For a recent example of Marsalis attitudes toward hip-hop and the cultures he associates with it, see the libretto to “The Ever Fonky Lowdown” (2020) and the lyrics and liner notes to the album, “From the Plantation to the Penitentiary” (2007).

Blackness is certainly crucial to JALC's ideological program, but it is couched within a fuzzy paradigm of multicultural US exceptionalism that mutes much of its transgressive force. By vocally aligning jazz with an overtly celebratory mythology of US democracy as historically blood-soaked yet ultimately a beacon of opportunity and freedom, JALC incorporates jazz so deeply into the nation's political theology that the music loses much of its ability to critique the system itself. Though the importance of Black cultural heritage to jazz and to the nation is consistently showcased, Marsalis and his associates embrace discourses of liberal universalism and a general denial of "race thinking"³³ that they feel oversimplify history and place limitations on Black musicians and thinkers. By embracing this "post-nationalist, universalist, and American-exceptionalist project" (Porter 2002, 321), JALC's central ideological and political orientation reproduces promotes an overall trope of transparency and universalism, much like Henri Lefebvre's "illusion of transparency" discussed above (cf. on spatial transparency McKittrick 2006). That is, JALC embraces various kinds of universalism that encumber affirmative solutions to racial inequality by mimicking, in sound and rhetoric, the same illusions of formal equal opportunity that too often result in preserving and continuing white supremacy. Further, by submitting jazz and its sound so deeply into the logic of exchange, JALC reaffirms many of the political economic forces that have long supported the continued inequality of the post-Jim Crow era.

³³ Marsalis once told James Lincoln Collier in a debate about JALC's practices, "the basis of jazz music is in the American Negro culture. Not race...Race is physiology. This is a matter of culture" (Marsalis, Collier, and Craddock-Willis 1995, 164).

Western modernity's foundational principles of rationality and universalism posit a formal equality under the law, where individual freedoms of the autonomous are held paramount, yet such a system demands a conception of equality whereby a person's historically situated identity is suspended. There is little room for social difference since *de jure* equality is asserted as both the foundational principle of the political/judicial system and the primary modality of judging its justice. Modern liberal theories of justice demand that we tell ourselves all people must be treated equally, pointedly obscuring the widespread iniquities distributed at all levels of society. As many scholars have argued, the formal equal playing field and nominal "colorblindness" of the market, like the correlated modes of liberal post-1960s governance (formal equal opportunity and colorblind universalism), distract and divert the moral imperative to redress past and present inequalities (e.g., Bonilla-Silva 2014; Lipsitz 2019; Omi and Winant 2015; Harris 1993). As Kimberlé Crenshaw states, the supposed colorblindness of liberal governance and neoliberal capitalism "immunize[s] the racial status quo against any substantive redistribution" (1997, 282). Further, late liberal logics of capitalism defer questions of social and cultural distinctiveness and associated identity-linked iniquities under myths of "rational" markets as neutral mediators.

All of these "transparent" commitments to unmarked systems of aesthetics, politics, and economics are built on the same foundations—western pretenses of universal reason and the rational, self-possessing human subject of Modernity—as the modes of white male listening, witnessing, measuring, and technological manipulating I discussed in the first half of this chapter. In other words, the modalities of "transparency" of sound and technology I have been discussing throughout this dissertation are undergirded by the same basic political and epistemological frameworks that reinforce the current state of racial inequality in the US and

elsewhere. By recruiting jazz and its sound into these frameworks of whiteness, JALC thus “immunizes” whiteness and white supremacy from much of the oppositional force that jazz has long wielded.

Conclusion

In this dissertation, I have shown how the sound of jazz, and the ontology of live sonic performance, dramatically exceeds the strictly “musical” phenomena we tend to associate with human actors and their instruments. I proffer live performance as dynamic and radically relational, entangling networks of living and nonliving things. Without attending to the contributions of technologies, built environments, technical practices, and all manner of human labor, our understanding and enjoyment of musical performance would be incomplete. Attending to the actions performed by these assemblages of physical materials, and their manipulation by and collaboration with human technicians, provides a richer understanding and experience of live sonic performances of all kinds, while orienting us toward a more ethical relationship with the nonhuman and nonliving entities that co-constitute the world around us.

I have also highlighted throughout these pages how sound and technology are articulated within webs of overlapping political/ideological projects, and how they have profound implications for race and other forms of difference. In the first two chapters, I showed how a team of elite technicians designed the internal acoustics of Jazz at Lincoln Center’s Rose Theater (chapter 1) and its striking isolation from the exterior world (chapter 2) in order to posit a “sound of jazz” redolent with western art music ideals while encoding certain Afrodiasporic performance attributes into the room’s material architecture. JALC is well documented for asserting that jazz should have the “same respect” (Lewis 2004) as western art music, embracing many of the evaluative and institutional standards of the western art world (music-theoretical complexity, canonical logics, etc.). Yet JALC’s alignments with these traditions in the realm of “nonmusical” sound, and how technological systems and practices are recruited into these projects, have never before been analyzed as I do in this study.

Running through the first two chapters was a trope of “pure and clean sound,” which was also central to chapter 3, which began a shift in this dissertation’s narrative toward electroacoustic reinforcement. In that chapter, the pure and clean trope manifested in ideals of fidelity, transparency, and neutrality. I analyzed these and other tropes not only for their technical/quantitative aspects—which are often not as epistemologically coherent as technoscientific common sense encourages us to believe—but also for their resonances with more far-reaching concerns of human and nonhuman sociality. Most pertinently, throughout these three chapters, I showed how such sonic ideals resonated in important ways with JALC’s well-known attempts to construct jazz as a respected high art meant to be experienced in the same ways and with the same standards as western art music. Such efforts also reflect JALC’s, and especially Wynton Marsalis’s, desire to counter racist stereotypes of jazz, and Black performance more broadly, as rebellious, noisy, and bound up with various types of vice—what Marsalis described to me as “the outlaw thing.” In describing how he wanted JALC’s performance spaces to sound, Marsalis engaged a rhetoric of universality in order to claim for jazz and jazz musicians a freedom from acoustical stereotypes, specifically resisting the racially overdetermined trope of the basement jazz club as the “proper place” for authentic performance. I agree about the debilitating aspects of such stereotypes, but I find that the sound of JALC’s rooms, and the ideas behind their design, have more to do with specifically western traditions of musical performance than any universalistic artistic freedom or agency.

In later chapters, I point toward further ways that the technologies I discuss exhibit dissonances with various aspects of JALC’s mission. Namely, I argue that through deployments of technological systems and epistemological frameworks, the sound of jazz is entangled with colorblindness and whiteness. Especially in chapter 5, I worry about how a dedication to control,

exchange value, and the objectification of sonic space as a technoscientific enterprise overlaps with the “circulatory system” of European male bourgeois whiteness (Haraway 2018).

Crucial to these explorations has been Meyer Sound Laboratories and their distinctive approach to using innovative digital technology to conceptualize sound and space as objects of rational measurement and manipulation. All of JALC’s sound systems were built and optimized by Meyer Sound technicians, using techniques innovated by personnel from the company (most notably my interlocutors Bob McCarthy and John Meyer). The Meyer Sound community is dedicated to science and technology, and the capacity for rational methods to ontologize sonic spaces as objectively controllable and “neutral.” Especially important documentation was found at Montreux Jazz Festival, where Meyer Sound is an extraordinary presence, and where I observed over 15 venues being constructed with brand new sound systems. My analysis showed a knotty overlapping of “objective” epistemological commitments and complex interchanges between human and nonhuman agencies. I revealed how despite a sincere commitment to the objective pursuit of controlling sound and space, the irrepressible influence of nonhuman materials must be attended to in any understanding of sonic performance.

These are just a few examples of how I have shown throughout this study how technologies and other arrangements of nonliving matter can be recruited into a range of human political projects while sometimes exhibiting tendencies dissonant with those intentions. At the very least, I have shown that by thoroughly investigating—and listening to—these technologies, and the ways they are oriented by (as they orient) human actions and desires, we find the political and phenomenological reality of spaces like JALC and the Montreux Jazz Festival to be more complex and contradictory than ever.

Indeed, when I claim that the sound of jazz accrues alignments with or orientations around whiteness, colorblindness, and western epistemology, I do not claim that the space I discussed are overwhelmed or *dominated* by these formations. While I claim that the technological deployments in this dissertation attenuate jazz’s liberatory potential, this doesn’t mean that they extinguish or corrupt the capacity for the music and its culture to be a force for change or a site of sincere “ethnocentric energy” (Ramsey 2003).

Building on Sara Ahmed’s notion of race and whiteness as bundles of orientations (see chapter 5), it is perhaps best to understand the heavily mediated sonic environments I have discussed in these pages as one impactful assemblage of background forces articulated within an even larger constellation of agencies and relations that orient bodies, ideas, and feelings to provide the “background of social action” (Ahmed 2007, 149). I emphasize that while the modes of conditioning sound and space discussed in this dissertation are crucially important, they must be understood within a wider tapestry of phenomena: the musical-discursive, the linguistic, the visual, and so forth.

The most basic proposition I espouse is that we pay closer attention to sound, and specifically the aspects of sound that go unnoticed behind and beneath “the music” and the words that surround it. I do not claim that the aspects of sound I discuss here are more important than, or even *as* important as, the “musical” or “discursive” aspects.¹ Nor do I claim that the approaches to sound I describe here *undermine* JALC’s overall political/ideological project, which is carried out on many levels—through musical discourse, programming choices,

¹ By “musical” I am referring to the musical-discursive codes that operate on a more representational, symbolic, or semiotic levels. These are the aspects that become intelligible through common understandings of musical codes and their connected social/cultural meanings.

marketing materials, published books, interviews, and so much more. Nevertheless, by attending to the aspects of sound addressed in these pages, we are prompted to understand all of these modalities of JALC's activities in new ways. The sound of jazz, and an awareness of the material work required to bring it into existence, demands that we listen differently—and more closely—to all the practices surrounding the music's performance.

My study has shown that many different sonic ideals can coexist during any performance—which shouldn't be surprising. Jazz participates in a wide network of Afrodiasporic practices with a marked diversity of perspectives and approaches, a rhizomatic assemblage of riffs and exchanges across intercultural lines. Much of my analysis has unfolded from a dissonance between (1) ideas of an “irreducible materiality” (Moten 2003) that provides the sound of jazz with a “freedom drive” that challenges western codes of rationality and universalism and (2) technological regimes entrenched in precisely the same western codes and frameworks. This dissonance is not meant to imply a strict binary but rather to serve as a catalyst toward more diffractive modes of inquiry. For irreducibility is not a requirement for jazz authenticity, or for oppositional politics. Nor is there a good reason to demand that jazz, however politically or ethnically inflected, must eschew ideals of clarity, scientific rationalization, sonic isolation, and so forth. Strict binaries break down.

Jazz musicians in particular have long shared a wide variety of perspectives that can be called upon for different purposes depending on the situation, either musically or discursively. A particularly relevant example is found in Ingrid Monson's interviews for her book *Saying Something* (1996):

Universalist and ethnically assertive points of view, it must be emphasized, often coexist in the same person and are best conceived as discourses upon which musicians draw in particular interactive contexts. An individual speaking to an interlocutor who underplays the role of African American culture in the music, for example, might choose to respond

with ethnically assertive comments. In a context in which something closer to racial harmony prevails, a musician might choose to invoke a more universalistic rhetoric. These are two sides of a tension between universality and cultural particularity that perhaps explains the wide range of apparently contradictory opinions that can be expressed about these issues in the jazz world. On the one hand, performers are proud to play music that inspires musicians and audiences beyond its culture and country of origin; on the other, many object to the attempts of non-African Americans to gloss over the African American cultural origins and leadership in the music through the language of equality. (Monson 1996, 202–3)

My study has interrogated much the same binary between “universalist and ethnically assertive points of view,” asserting that the colorblind universalism found in the technologies I’ve studied shift the balance toward the former—at least in the domains of sound within the scope of this dissertation.

Much like Monson’s interlocutors, JALC and Wynton Marsalis are adept at embracing universalist, colorblind discourse at one moment while embracing the rhetoric—and sound—of African American distinctiveness at others. Both of these positions, as well as countless others, can and do exist at the same time, and can be referenced and evoked for a range of purposes at different times. Without a more comprehensive understanding of the political and epistemological entanglements of sound and technology we would be left with a critically limited understanding of jazz music, musical-sonic performance more broadly, and the crucial impact of music and sound on human social life on the whole.

References

- Abrahams, Roger D., and John F. Szwed, eds. 1983. *After Africa: Extracts from British Travel Accounts and Journals of the Seventeenth, Eighteenth, and Nineteenth Centuries Concerning the Slaves, Their Manners, and Customs in the British West Indies*. New Haven, CT: Yale University Press.
- Ahmed, Sara. 2007. "A Phenomenology of Whiteness." *Feminist Theory* 8 (2): 149–168. <https://doi.org/10.1177/1464700107078139>.
- . 2008. "Open Forum Imaginary Prohibitions: Some Preliminary Remarks on the Founding Gestures of the 'New Materialism.'" *European Journal of Women's Studies* 15 (1): 23–39. <https://doi.org/10.1177/1350506807084854>.
- Ake, David. 2002. "'Blue Horizon': Creole Culture and Early New Orleans Jazz." In *Jazz Cultures*, 10–41. Berkeley: University of California Press.
- Alper, Svetlana. 1991. "The Museum as a Way of Seeing." In *Exhibiting Cultures: The Poetics and Politics of Museum Display*, edited by Ivan Karp and Steven D. Lavine, 25–32. Washington: Smithsonian Institution Press.
- Anderson, Iain. 2007. *This Is Our Music: Free Jazz, the Sixties, and American Culture*. Philadelphia: University of Pennsylvania Press.
- Artner, Alan G. 2002. "Unsound Design." *Chicago Tribune*, December 1, 2002. <https://www.chicagotribune.com/news/ct-xpm-2002-12-01-0212010410-story.html>.
- Atkins, E. Taylor, ed. 2003. *Jazz Planet*. Jackson: University Press of Mississippi.
- Attali, Jacques. 1985. *Noise: The Political Economy of Music*. Minneapolis: University of Minnesota Press.
- Auslander, Philip. 1999. *Liveness: Performance in a Mediatized Culture*. London: Routledge.
- Badger, R. Reid. 1989. "James Reese Europe and the Prehistory of Jazz." *American Music* 7 (1): 48–67. <https://doi.org/10.2307/3052049>.
- Barad, Karen. 2007. "Meeting the Universe Halfway." In *Meeting the Universe Halfway*. Durham, NC: Duke University Press.
- Baraka, Imamu Amiri. 2009. *Digging: The Afro-American Soul of American Classical Music*. Berkeley: University of California Press.
- Bauman, Richard. 1975. "Verbal Art as Performance." *American Anthropologist* 77 (2).
- Bauman, Richard, and Charles L. Briggs. 2003. *Voices of Modernity: Language Ideologies and the Politics of Inequality*. Cambridge, UK: Cambridge University Press.

- Becker, Howard S. 1951. "The Professional Dance Musician and His Audience." *American Journal of Sociology* 57 (2): 136–144.
- . 1966. *Outsiders: Studies in The Sociology of Deviance*. New York: The Free Press.
- Béhague, Gerard, ed. 1984. *Performance Practice: Ethnomusicological Perspectives*. Westport, Conn: Greenwood Press.
- Benjamin, Walter. 2007. "The Work of Art in the Age of Mechanical Reproduction." In *Illuminations*, translated by Harry Zohn, 217–51. New York: Schocken.
- Bennett, Jane. 2010. *Vibrant Matter: A Political Ecology of Things*. Durham, NC: Duke University Press.
- . 2012. "Systems and Things: A Response to Graham Harman and Timothy Morton." *New Literary History* 43 (2): 225–233. <https://doi.org/10.1353/nlh.2012.0020>.
- Beranek, Leo L. 2004. *Concert Halls and Opera Houses: Music, Acoustics, and Architecture*. New York: Springer.
- Berish, Andrew. 2018. "Space and Place in Jazz." In *The Routledge Companion to Jazz Studies*, edited by Nicholas Gebhardt, Nichole Rustin-Paschal, and Tony Whyton, 153–62. Routledge. <https://doi.org/10.4324/9781315315805-15>.
- Berkow, Sam. 2011. Sam Berkow. National Association of Music Merchants Oral History Archive. <https://www.namm.org/library/oral-history/sam-berkow>.
- Berliner, Paul F. 1994. *The Infinite Art of Improvisation*. Chicago: University of Chicago Press.
- Bijker, Wiebe E., Thomas Parke Hughes, and Trevor Pinch, eds. 2012. *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*. Cambridge, MA: MIT Press.
- Bijsterveld, Karin. 2008. *Mechanical Sound: Technology, Culture, and Public Problems of Noise in the Twentieth Century*. Inside Technology. Cambridge, MA: MIT Press.
- Blessner, Barry, and Linda-Ruth Salter. 2007b. *Spaces Speak, Are You Listening? Experiencing Aural Architecture*. Cambridge, MA: MIT Press.
- . 2007a. *Spaces Speak, Are You Listening? Experiencing Aural Architecture*. Cambridge, MA: MIT Press.
- . 2012. "Ancient Acoustic Spaces." In *The Sound Studies Reader*, edited by Sterne, Jonathan, 186–96. London: Routledge.
- Bohlman, Philip V., and Goffredo Plastino, eds. 2016. *Jazz Worlds, World Jazz*. Chicago: University of Chicago Press.

- Bonilla-Silva, Eduardo. 2014. *Racism without Racists: Color-Blind Racism and the Persistence of Racial Inequality in America*. Lanham, MD: Rowman & Littlefield.
- Bonilla-Silva, Eduardo, Carla Goar, and David G. Embrick. 2006. "When Whites Flock Together: The Social Psychology of White Habitus." *Critical Sociology* 32 (2–3): 229–253. <https://doi.org/10.1163/156916306777835268>.
- Born, Georgina. 2005. "On Musical Mediation: Ontology, Technology and Creativity." *Twentieth-Century Music* 2 (1): 7–36.
- . 2018. "On Nonhuman Sound—Sound as Relation." In *Sound Objects*, edited by James A. Steintrager and Rey Chow, 185–208. Durham, NC: Duke University Press.
- Braidotti, Rosi. 2013. *The Posthuman*. Cambridge, UK: Polity Press.
- Bryant, Levi, Nick Srnicek, and Graham Harman, eds. 2011a. *The Speculative Turn: Continental Materialism and Realism*. Victoria, Australia: re. press.
- . 2011b. "Towards a Speculative Philosophy." In *The Speculative Turn: Continental Materialism and Realism*, edited by Levi Bryant, Nick Srnicek, and Graham Harman, 1–18. Victoria, Australia: re. press.
- Bull, Michael, and Les Back. 2003. "Introduction: Into Sound." In *The Auditory Culture Reader*, 1–18. Oxford: Berg.
- Burke, Patrick Lawrence. 2008. *Come in and Hear the Truth: Jazz and Race on 52nd Street*. Chicago: University of Chicago Press.
- Cameron, William Bruce. 1954. "Sociological Notes on the Jam Session." *Social Forces* 33 (2): 177–182.
- Caro, Robert A. 1974. *The Power Broker: Robert Moses and the Fall of New York*. New York: Knopf.
- Chakrabarty, Dipesh. 2008. *Provincializing Europe: Postcolonial Thought and Historical Difference*. Princeton, NJ: Princeton University Press.
- Chapman, Dale. 2018. *The Jazz Bubble: Neoclassical Jazz in Neoliberal Culture*. Berkeley: University of California Press.
- Charters, Samuel, and Leonard Kunstadt. 1981. *Jazz: A History of the New York Scene*. New York: Da Capo Press.
- Cheng, William. 2018. "Black Noise, White Ears: Resilience, Rap, and the Killing of Jordan Davis." *Current Musicology*, no. 102: 115–189.
- Clifford-Napoleone, Amber R. 2018. *Queering Kansas City Jazz: Gender, Performance, and the History of a Scene*. Lincoln: University of Nebraska Press.

- Collins, H. M. 1974. "The TEA Set: Tacit Knowledge and Scientific Networks." *Science Studies* 4 (2): 165–185.
- . 1992. *Changing Order: Replication and Induction in Scientific Practice*. Chicago: University of Chicago Press.
- . 1998. "The Meaning of Data: Open and Closed Evidential Cultures in the Search for Gravitational Waves." *American Journal of Sociology* 104 (2): 293–338. <https://doi.org/10.1086/210040>.
- Coole, Diana, and Samantha Frost. 2010. "Introducing the New Materialisms." In *New Materialisms*, 1–44. Durham, NC: Duke University Press.
- Cowan, Ruth S. 1985. "How the Refrigerator Got Its Hum." In *The Social Shaping of Technology: How the Refrigerator Got Its Hum*, edited by Donald A. MacKenzie and Judy Wajcman, 202–18. Milton Keynes, UK: Open University Press.
- Crawford, Richard. 2001. *America's Musical Life: A History*. New York: Norton.
- Crawley, Ashon T. 2017. *Blackpentecostal Breath: The Aesthetics of Possibility*. New York: Fordham University Press.
- Crenshaw, Kimberlé. 1997. "Color Blindness, History, and the Law." In *The House That Race Built: Black Americans, U.S. Terrain*, edited by Wahneema H. Lubiano, 280–88. New York: Pantheon Books.
- Cressman, Darryl. 2015. "Acoustic Architecture Before Science." *SoundEffects - An Interdisciplinary Journal of Sound and Sound Experience* 5 (1): 10–23. <https://doi.org/10.7146/se.v5i1.23304>.
- . 2016. *Building Musical Culture in Nineteenth-Century Amsterdam: The Concertgebouw*. Amsterdam: Amsterdam University Press.
- Crouch, Stanley. 1990. "Standard Time, Vol. 3 - The Resolution of Romance." CBS. Liner Notes.
- Currie, Scott. 2012. "'The Revolution Never Ended': The Cultural Politics of a Creative-Music Collective in New York City." *Jazz Research Journal* 5 (1–2): 43–65. <https://doi.org/10.1558/jazz.v5i1-2.43>.
- DeLanda, Manuel. 2002. *Intensive Science and Virtual Philosophy*. London: Continuum.
- . 2006. *New Philosophy of Society: Assemblage Theory and Social Complexity*. London: Continuum.
- DeVeaux, Scott. 1989. "The Emergence of the Jazz Concert, 1935-1945." *American Music* 7 (1): 6–29. <https://doi.org/10.2307/3052047>.

- . 1991. “Constructing the Jazz Tradition: Jazz Historiography.” *Black American Literature Forum* 25 (3): 525-560. <https://doi.org/10.2307/3041812>.
- . 1997. *The Birth of Bebop: A Social and Musical History*. Berkeley: University of California Press.
- Devine, Kyle. 2013. “Imperfect Sound Forever: Loudness, Listening Formations, and the Historiography of Sound Reproduction.” Ottawa: Carleton University.
- Doria, Damian. 2005. “Going with a Swing.” *Auditoria*, January 2005.
- Dovey, Kim, and Kim Dovey. 2010. *Becoming Places: Urbanism/Architecture/Identity/Power*. London and New York: Routledge.
- Doyle, Peter. 2005. *Echo and Reverb: Fabricating Space in Popular Music Recording, 1900-1960*. Middletown, CT: Wesleyan University Press.
- Driggs, Frank, and Chuck Haddix. 2005. *Kansas City Jazz: From Ragtime to Bebop: A History*. New York: Oxford University Press.
- Dugan, James, and John Hammond. 1974. “An Early Black-Music Concert from Spirituals to Swing.” *The Black Perspective in Music* 2 (2): 191–207. <https://doi.org/10.2307/1214236>.
- Dyer, Richard. 2017. *White*. New York: Routledge.
- Early, Gerald, and Ingrid T. Monson. 2019. “Why Jazz Still Matters.” *Daedalus* 148 (2): 5–12. https://doi.org/10.1162/daed_a_01738.
- Eidsheim, Nina Sun. 2015. *Sensing Sound: Singing & Listening as Vibrational Practice*. Durham, NC: Duke University Press.
- Ellison, Ralph. 1972. *Shadow and Act*. New York: Vintage Books.
- . 1995a. “Blues People.” In *Shadow and Act*. New York: Vintage Books.
- . 1995b. *Invisible Man*. New York: Vintage International.
- Enstad, Nan. 2016. “Smoking Hot: Cigarettes, Jazz, and the Production of Global Imaginaries in Interwar Shanghai.” In *Audible Empire*, edited by Ronald Michael Radano and Tejumola Olaniyan, 45–65. Duke University Press. <https://doi.org/10.1215/9780822374947-003>.
- Epstein, Dena J. Polacheck. 1977. *Sinful Tunes and Spirituals: Black Folk Music to the Civil War*. Urbana: University of Illinois Press.
- Ernst, Hugh C. 2015. “The Man Who Made a Lady out of Jazz.” In *Keeping Time: Readings in Jazz History*, edited by Robert Walser, 39–40. New York: Oxford University Press.

- Europe, James Reese. 2015. "A Negro Explains 'Jazz.'" In *Keeping Time: Readings in Jazz History*, edited by Robert Walser, 10–12. New York: Oxford University Press.
- Ewell, Philip A. 2020. "Music Theory and the White Racial Frame." *Music Theory Online* 26 (2): 324–329. <https://doi.org/10.30535/mto.26.2.4>.
- Feagin, Joe R. 2020. *The White Racial Frame: Centuries of Racial Framing and Counter-Framing*. New York: Routledge.
- Feld, Steven. 2012. *Sound and Sentiment: Birds, Weeping, Poetics, and Song in Kaluli Expression*. Durham, NC: Duke University Press.
- . 2015. "Acoustemology." In *Keywords in Sound*, edited by David Novak and Matt Sakakeeny, 12–21. Durham, NC: Duke University Press.
- . 2017. "On Post-Ethnomusicology Alternatives: Acoustemology." In *Perspectives on a 21st Century Comparative Musicology: Ethnomusicology or Transcultural Musicology?*, edited by Francesco Giannattasio and Giovanni Giurati, 82–98. Udine, IT: Nota.
- Fellezs, Kevin. 2007. "Silenced but Not Silent: Asian Americans and Jazz." In *Alien Encounters: Popular Culture in Asian America*, edited by Thuy Linh Nguyen Tu and Mimi Thi Nguyen, 69–108. Durham, NC: Duke University Press. <https://doi.org/10.1215/9780822389835>.
- Fischlin, Daniel, Ajay Heble, and George Lipsitz. 2013. *The Fierce Urgency of Now: Improvisation, Rights, and the Ethics of Cocreation*. Durham, NC: Duke University Press.
- Fiske, John. 2016. *Media Matters: Race and Gender in U.S. Politics*. New York: Routledge Taylor & Francis Group.
- Fleck, Ludwik. 1981. *Genesis and Development of a Scientific Fact*. Edited by Thaddeus J. Trenn and Robert K. Merton. Translated by Fred Bradley and Thaddeus J. Trenn. Chicago: University of Chicago Press.
- Floyd, Samuel A. 1995. *The Power of Black Music*. New York: Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780195109757.001.0001>.
- Fouché, Rayvon. 2006. "Say It Loud, I'm Black and I'm Proud: African Americans, American Artifactual Culture, and Black Vernacular Technological Creativity." *American Quarterly* 58 (3): 639–661.
- Fox, Aaron A. 2004. *Real Country Music and Language in Working-Class Culture*. Durham, NC: Duke University Press. <http://dx.doi.org/10.1215/9780822385998>.
- Frankenberg, Ruth. 2005. *White Women, Race Matters: The Social Construction of Whiteness*. Minneapolis: University of Minnesota Press.

- Gallo, Phil. 2004. "Rose Hall Has Jazz on Upbeat: Fresh Gotham Landmark Trumpets Music Form." *Variety*, October 24, 2004.
- Gates, Henry Louis. 1988. *The Signifying Monkey: A Theory of African-American Literary Theory*. New York: Oxford University Press.
- Geertz, Clifford. 1973. "Thick Description: Toward an Interpretive Theory of Culture." In *The Interpretation of Cultures: Selected Essays*, 3–30. New York: Basic Books.
- Gennari, John. 2006. *Blowin' Hot and Cool: Jazz and Its Critics*. Chicago: University of Chicago Press.
- Gieryn, Thomas F. 1999. *Cultural Boundaries of Science: Credibility on the Line*. Chicago: University of Chicago Press.
- Gieryn, Thomas F. 2002. "What Buildings Do." *Theory and Society* 31 (1): 35–74.
- Gilmore, Ruth Wilson. 2002. "Fatal Couplings of Power and Difference: Notes on Racism and Geography." *The Professional Geographer* 54 (1): 15–24. <https://doi.org/10.1111/0033-0124.00310>.
- Gilroy, Paul. 1993. *The Black Atlantic: Modernity and Double Consciousness*. Cambridge, MA: Harvard University Press.
- Gioia, Ted. 1989. "Jazz and the Primitivist Myth." *The Musical Quarterly* 73 (1): 130–143.
- . 2011. *The History of Jazz*. New York: Oxford University Press.
- Gitler, Ira. 1985. *Swing to Bop: An Oral History of the Transition in Jazz in the 1940s*. New York: Oxford University Press.
- Givan, Benjamin. 2021. "How Democratic Is Jazz?" In *Finding Democracy in Music*, edited by Robert Adlington and Esteban Buch, 58–79. London: Routledge. <https://www.taylorfrancis.com/books/9780367486938>.
- Goehr, Lydia. 1992. *The Imaginary Museum of Musical Works: An Essay in the Philosophy of Music*. New York: Oxford University Press.
- Goffman, Erving. 1974. *Frame Analysis: An Essay on the Organization of Experience*. Harvard University Press.
- Goh, Annie. 2017. "Sounding Situated Knowledges: Echo in Archaeoacoustics." *Parallax* 23 (3): 283–304. <https://doi.org/10.1080/13534645.2017.1339968>.
- Gould, Stephen Jay. 1996. *The Mismeasure of Man*. New York: Norton.
- Gourlay, Kenneth A. 1972. "The Practice of Cueing among the Karimojon of North-East Uganda." *Ethnomusicology* 16 (2): 240–247.

- Gracyk, Theodore. 2002. "Jazz After Jazz: Ken Burns and the Construction of Jazz History." *Philosophy and Literature* 26 (1): 173–187. <https://doi.org/10.1353/phl.2002.0011>.
- Gray, Herman. 2005. *Cultural Moves: African Americans and the Politics of Representation*. Berkeley: University of California Press.
- Greenland, Thomas H. 2016. *Jazzing: New York City's Unseen Scene*. Champaign: University of Illinois Press.
- Gregory, Steven. 1998. *Black Corona: Race and the Politics of Place in an Urban Community*. Princeton, NJ: Princeton University Press.
- . 2020. "Making the 'American Acropolis': On Verticality, Social Hierarchy, and the Obduracy of Manhattan Schist." *Annals of the American Association of Geographers* 110 (1): 78–97. <https://doi.org/10.1080/24694452.2019.1625746>.
- Grosz, E. A. 2011. *Becoming Undone: Darwinian Reflections on Life, Politics, and Art*. Durham: Duke University Press.
- Grusin, Richard A., ed. 2015. *The Nonhuman Turn*. Minneapolis: University of Minnesota Press.
- Haraway, Donna Jeanne. 1988. "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective." *Feminist Studies* 14 (3): 575–599.
- . 1991. "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century." In *Simians, Cyborgs, and Women: The Reinvention of Nature*, 149–81. New York: Routledge.
- . 2006. *Primate Visions: Gender, Race, and Nature in the World of Modern Science*. New York: Routledge.
- . 2018. *Modest_Witness@Second_Millennium. FemaleMan_Meets_OncoMouse: Feminism and Technoscience*. New York: Routledge.
- Harding, Sandra. 1992a. "After the Neutrality Ideal: Science, Politics, and "Strong Objectivity"." *Social Research*.
- . 1992b. "Rethinking Standpoint Epistemology: What Is 'Strong Objectivity?'" *The Centennial Review* 36 (3): 437–470.
- . 1995. "'Strong Objectivity': A Response to the New Objectivity Question." *Synthese* 104 (3): 331–349.
- . 2016a. "'Strong Objectivity' and Socially Situated Knowledge." In *Whose Science? Whose Knowledge?*, 138–63. Cornell University Press.
- . 2016b. *Whose Science? Whose Knowledge?* Ithaca, NY: Cornell University Press.
- Harman, Graham. 2011. *The Quadruple Object*. Winchester: Zero books.

- Harney, Stefano, and Fred Moten. 2013. *The Undercommons: Fugitive Planning & Black Study*. Wivenhoe New York Port Watson: Minor Compositions.
- Harris, Cheryl I. 1993. "Whiteness as Property." *Harvard Law Review* 106 (8): 1707–1791.
- Heap, Chad C. 2009. *Slumming: Sexual and Racial Encounters in American Nightlife, 1885-1940*. Chicago: University of Chicago Press.
- Heble, Ajay, and Rob Wallace. 2013. "Introduction 'People Get Ready': The Future of Jazz Is Now!" In *People Get Ready*, 1–28. Durham, NC: Duke University Press.
- Heller, Michael C. 2017. *Loft Jazz: Improvising New York in the 1970s*. Oakland: University of California Press.
- Henare, Amiria, Martin Holbraad, and Sari Wastell. 2007. "Introduction: Thinking through Things." In *Thinking through Things: Theorising Artefacts Ethnographically*, edited by Amiria Henare, Martin Holbraad, and Sari Wastell, 1–31. New York: Routledge.
- Hentoff, Nat. 1980. "Introduction." In *Live at the Village Vanguard*, by Max Gordon. New York: Da Capo Press.
- Herndon, Marcia. 1971. "The Cherokee Ballgame Cycle: An Ethnomusicologist's View." *Ethnomusicology* 15 (3): 339–352. <https://doi.org/10.2307/850634>.
- Herndon, Marcia, and Roger Brunyate. 1975. *Proceedings of a Symposium on Form in Performance: Hard-Core Ethnography*. Austin: Office of the College of Fine Arts, University of Texas.
- Hinckley, David. 2004. "The House of Swing: Jazz at Lincoln Center Moves into New Dig." *New York Daily News*.
<http://ezproxy.cul.columbia.edu/login?url=https://www.proquest.com/newspapers/house-swing-jazz-at-lincoln-center-moves-into-new/docview/305929982/se-2?accountid=10226>.
- "History." n.d. Jazz at Lincoln Center Website. Accessed September 29, 2021.
<https://www.jazz.org/history/>.
- Hughes, Langston. 1995. "Note on Commercial Theater." In *The Collected Poems of Langston Hughes*, edited by Arnold Rampersad and David E. Roessel, 215–16. New York: Vintage Books.
- Ingleton, Holly. 2016. "Recalibrating Fundamentals of Discipline and Desire Through the *Automatic Music Tent*." *Contemporary Music Review* 35 (1): 71-84.
<https://doi.org/10.1080/07494467.2016.1176768>.
- Jackson, Travis. 2003. "Jazz as Musical Practice." In *The Cambridge Companion to Jazz*, edited by Mervyn Cooke and David Horn, 81–95. Cambridge, UK: Cambridge University Press.
<https://doi.org/10.1017/CCOL9780521663205.007>.

- . 2012. *Blowin' the Blues Away: Performance and Meaning on the New York Jazz Scene*. Berkeley: Univ of California Press.
- . 2016. "Culture, Commodity, Palimpsest: Locating Jazz in the World." In *Jazz Worlds, World Jazz*, edited by Philip V. Bohlman and Goffredo Plastino, 381–401. Chicago: University of Chicago Press.
- Jackson, Zakiyyah Iman. 2015. "Outer Worlds: The Persistence of Race in Movement 'Beyond the Human.'" *GLQ: A Journal of Lesbian and Gay Studies* 21 (2/3): 215–218.
- Jacobson, Mark. 2001. "Wynton Center." *New York Magazine*, December 24, 2001. <https://nymag.com/nymetro/arts/music/features/5527/>.
- Jacques, Geoffrey. 2001. "A Roundtable on Ken Burns's Jazz." *Journal of Popular Music Studies* 13 (2): 207–225. <https://doi.org/10.1111/j.1533-1598.2001.tb00025.x>.
- Jaffe, J Christopher. 2010. *The Acoustics of Performance Halls*. New York: W.W. Norton & Co.
- James, Robin. 2019. *The Sonic Episteme: Acoustic Resonance, Neoliberalism, and Biopolitics*. Durham, NC: University Press.
- Jameson, Fredric. 1973. "The Vanishing Mediator: Narrative Structure in Max Weber." *New German Critique*, no. 1: 52–89.
- Jankowsky, Richard. 2016. "The Medium Is the Message? Jazz Diplomacy and the Democratic Imagination." In *Jazz Worlds, World Jazz*, edited by Philip V. Bohlman and Goffredo Plastino, 258–88. Chicago: The University of Chicago Press.
- "Jazz at Lincoln Center." n.d. WSDG. Accessed September 30, 2021. <https://wsdg.com/projects-items/jazz-at-lincoln-center/>.
- Johnson, Bruce. 2020. *Jazz Diaspora: Music and Globalisation*. New York: Routledge.
- Johnson, David. 1999. "That San Francisco Sound: How the 60s Brought Audio Manufacturers to the Bay Area." *Live Design*. February 1, 1999. https://web.archive.org/web/20110929020720/http://livedesignonline.com/mag/show_business_san_francisco_sound/index.html.
- Johnson, James H. 1995. *Listening in Paris: A Cultural History*. Berkeley: University of California Press.
- Jones, Leroi. 1963. *Blues People: Negro Music in White America*. Westport, CT: Greenwood Press.
- . 1967a. *Black Music*. New York: William Morrow & Company, Inc.
- . 1967b. "Jazz and the White Critic." In *Black Music*, 11–20. New York: William Morrow & Company.

- . 1967c. “The Changing Same (R&B and New Black Music).” In *Black Music*, 180–211. New York: William Morrow & Company, Inc.
- Kajikawa, Loren. 2019. “The Possessive Investment in Classical Music: Confronting Legacies of White Supremacy in U.S. Schools and Departments of Music.” In *Seeing Race Again: Countering Colorblindness across the Disciplines*, edited by Kimberlé Crenshaw, Luke Charles Harris, Daniel HoSang, and George Lipsitz, 155–74. Oakland: University of California Press.
- Kaye, Lewis. 2012. “The Silenced Listener: Architectural Acoustics, the Concert Hall and the Conditions of Audience.” *Leonardo Music Journal* 22 (December): 63–65. https://doi.org/10.1162/LMJ_a_00100.
- Keller, Evelyn Fox. 1992. *Secrets of Life, Secrets of Death: Essays on Language, Gender, and Science*. New York: Routledge.
- Kelley, Robin D. G. 1997. “The Riddle of the Zoot: Malcolm Little and Black Cultural Politics during World War II.” In *Race and the Subject of Masculinities*, edited by Harilaos Stecopoulos and Michael Uebel. Durham, NC: Duke University Press. <https://doi.org/10.1215/9780822397748>.
- . 2000. “Forward.” In *Black Marxism: The Making of the Black Radical Tradition*, by Cedric J. Robinson, xi–xxvi. Chapel Hill: University of North Carolina Press.
- Kendi, Ibram X. 2019. *How to Be an Antiracist*. New York: One World.
- Kenney, William Howland. 1983. “Jazz and the Concert Halls: The Eddie Condon Concerts, 1942–48.” *American Music* 1 (2): 60–72.
- . 1993. *Chicago Jazz: A Cultural History, 1904-1930*. New York: Oxford University Press.
- Kenny, Tom. 2014. “John Meyer: A Lifetime of Sound Science.” Mixonline. February 1, 2014. <https://www.mixonline.com/news/john-meyer-lifetime-sound-science-423970>.
- Kirchberger, Martin, and Frank A. Russo. 2016. “Dynamic Range Across Music Genres and the Perception of Dynamic Compression in Hearing-Impaired Listeners.” *Trends in Hearing* 20 (January). <https://doi.org/10.1177/2331216516630549>.
- Kivy, Peter. 1995. *Authenticities: Philosophical Reflections on Musical Performance*. Ithaca: Cornell University Press.
- Klotz, Kelsey A. K. 2016. “Racial Ideologies in 1950s Cool Jazz.” PhD diss., St. Louis: Washington University in St. Louis.
- . 2018. “On Musical Value: John Lewis, Structural Listening, and the Politics of Respectability.” *Jazz Perspectives* 11 (1): 25–51. <https://doi.org/10.1080/17494060.2018.1528996>.

- Knorr-Cetina, K. 1999. *Epistemic Cultures: How the Sciences Make Knowledge*. Cambridge, MA: Harvard University Press.
- Kobayashi, Audrey, and Linda Peake. 1994. "Unnatural Discourse. 'Race' and Gender in Geography." *Gender, Place & Culture* 1 (2): 225–243. <https://doi.org/10.1080/09663699408721211>.
- Koenig, Karl, ed. 2002. *Jazz in Print (1856-1929): An Anthology of Selected Early Readings in Jazz History*. Hillsdale, NY: Pendragon Press.
- Kohler, Robert E. 2002. "Labscales: Naturalizing the Lab." *History of Science* 40 (4): 473–501.
- Kuhn, Thomas S. 1996. *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press.
- Lastra, James. 2000. *Sound Technology and the American Cinema: Perception, Representation, Modernity*. New York: Columbia University Press.
- Latour, Bruno. 1987. *Science in Action: How to Follow Scientists and Engineers through Society*. Cambridge, MA: Harvard University Press.
- . 1992. "Where Are the Missing Masses?: The Sociology of a Few Mundane Artifacts." In *Shaping Technology/Building Society: Studies in Sociotechnical Change*, edited by Wiebe E. Bijker and John Law. Cambridge, MA: MIT Press.
- . 1993. *We Have Never Been Modern*. Cambridge, MA: Harvard University Press.
- . 2005. *Reassembling the Social: An Introduction to Actor-Network-Theory*. New York: Oxford University Press.
- Latour, Bruno, and Steve Woolgar. 2013. *Laboratory Life: The Construction of Scientific Facts*. Princeton, NJ: Princeton University Press.
- Laver, Mark. 2014. "Freedom of Choice: Jazz, Neoliberalism, and the Lincoln Center." *Popular Music and Society* 37 (5): 538–556. <https://doi.org/10.1080/03007766.2013.863640>.
- Law, John. 2004. *After Method: Mess in Social Science Research*. London: Routledge.
- Lefebvre, Henri. 1991. *The Production of Space*. Oxford, UK: Blackwell.
- Lengel, Kerry. 2015. "Wynton Marsalis and Jazz at Lincoln Center to Play in Mesa." *Arizona Republic*, September 20, 2015. <http://ezproxy.cul.columbia.edu/login?url=https://www.proquest.com/newspapers/wynton-marsalis-jazz-at-lincoln-center-play-mesa/docview/1713851078/se-2?accountid=10226>.

- Leong, Diana. 2016. "The Mattering of Black Lives: Octavia Butler's Hyperempathy and the Promise of the New Materialisms." *Catalyst: Feminism, Theory, Technoscience* 2 (2): 1–35. <https://doi.org/10.28968/cftt.v2i2.28799>.
- "Let Freedom Swing." n.d. Jazz at Lincoln Center. Accessed December 13, 2021. <https://www.jazz.org/let-freedom-swing/>.
- Levine, Lawrence W. 1977. *Black Culture and Black Consciousness: Afro-American Folk Thought from Slavery to Freedom*. New York: Oxford University Press.
- Lewcock, Ronald, Rijn Pirn, Jürgen Meyer, Carleen M. Hutchins, J. Woodhouse, John C. Schelleng, Bernard Richardson, et al. 2001. "Acoustics." *Grove Music Online*. <https://www-oxfordmusiconline-com.ezproxy.cul.columbia.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-0000000134>
- Lewis, David L. 1997. *When Harlem Was in Vogue*. New York: Penguin Books.
- Lewis, George E. 1996. "Improvised Music after 1950: Afrological and Eurological Perspectives." *Black Music Research Journal* 16 (1): 91–122. <https://doi.org/10.2307/779379>.
- . 2004. "Experimental Music in Black and White: The AACM in New York, 1970–1985." In *Uptown Conversation*, edited by Robert G. O'Meally, Brent Hayes Edwards, and Farah Jasmine Griffin, 50–101. New York: Columbia University Press. <https://doi.org/10.7312/omea12350-004>.
- . 2008. *A Power Stronger than Itself: The AACM and American Experimental Music*. Chicago: University of Chicago Press.
- . 2016. "Forward: Who Is Jazz?" In *Jazz Worlds, World Jazz*, edited by Philip V. Bohlman and Goffredo Plastino, ix–xxiv. Chicago: The University of Chicago Press.
- Lipsitz, George. 2004. "Songs of the Unsung: The Darby Hicks History of Jazz." In *Uptown Conversation: The New Jazz Studies*, edited by Robert G. O'Meally, Brent Hayes Edwards, and Farah Jasmine Griffin, 9–26. New York: Columbia University Press.
- . 2011. *How Racism Takes Place*. Philadelphia: Temple University Press.
- . 2018. *The Possessive Investment in Whiteness: How White People Profit from Identity Politics*. Philadelphia: Temple University Press.
- . 2019. "The Sounds of Silence: How Race Neutrality Preserves White Supremacy." In *Seeing Race Again: Countering Colorblindness across the Disciplines*, edited by Kimberlé Crenshaw, Luke Charles Harris, Daniel HoSang, and George Lipsitz, 23–51. Oakland: University of California Press.

- Lively, Nathan. 2013a. *Sound Design Live: Build Your Career as A Sound Engineer*. Nathan Lively.
- . 2013b. “Sound System Design and Optimization with Bob McCarthy.” <http://sounddesignlive.com/sound-system-design-optimization-bob-mccarthy>.
- . 2015. “SPECIAL REPORT: Sound System Design for Small Venues with Bob McCarthy.” <http://wp.me/p1sfi8-1er>.
- Loar, Josh. 2019. *The Sound System Design Primer*. New York: Routledge.
- Locke, Alain. 1936. *The Negro and His Music*. Washington: Associates in Negro Folk Education.
- Lopes, Paul Douglas. 2002. *The Rise of a Jazz Art World*. Cambridge, UK: Cambridge University Press.
- . 2005. “Signifying Deviance and Transgression: Jazz in the Popular Imagination.” *American Behavioral Scientist* 48 (11): 1468–1481. <https://doi.org/10.1177/0002764205277017>.
- Lott, Eric. 1988. “Double V, Double-Time: Bebop’s Politics of Style.” *Callaloo*, no. 36: 597–605. <https://doi.org/10.2307/2931544>.
- Lynch, Michael. 1985. *Art and Artifact in Laboratory Science: A Study of Shop Work and Shop Talk in a Research Laboratory*. London: Routledge & Kegan Paul.
- MacKenzie, Donald A., and Judy Wajcman, eds. 1985. *The Social Shaping of Technology: How the Refrigerator Got Its Hum*. Milton Keynes, UK: Open University Press.
- Mann, Geoff. 2008. “Why Does Country Music Sound White? Race and the Voice of Nostalgia.” *Ethnic and Racial Studies* 31 (1): 73–100. <https://doi.org/10.1080/01419870701538893>.
- Marsalis, Wynton. 1986. “Why We Must Preserve Our Jazz Heritage.” *Ebony*, February 1, 1986.
- . 1988. “What Jazz Is—and Isn’t.” *New York Times*, July 31, 1988.
- . 1998. “Ten Fundamentals of the House of Swing.” In author’s possession, provided by Jazz at Lincoln Center Archives.
- . 2007. *From the Plantation to the Penitentiary*. Blue Note Records.
- . 2020. *The Ever Fonky Lowdown*. Jazz at Lincoln Center Recordings.
- Marsalis, Wynton, James Lincoln Collier, and Andre Craddock-Willis. 1995. “Jazz People.” *Transition*, no. 65: 140–178.
- Marsalis, Wynton, and Hughlyn Fierce. 2004. “The ‘Sound of Jazz’ Team: Realizing the Jazz at Lincoln Center Vision for Frederick P. Rose Hall.” Press Release. Jazz at Lincoln Center.

- Marsalis, Wynton, and Frank Stewart. 1994. *Sweet Swing Blues on the Road*. New York: W. W. Norton & Company.
- . eds. 2012. *In the Spirit of Swing: The First 25 Years of Jazz at Lincoln Center*. San Francisco: Chronicle Books.
- Maultsby, Portia K. 2015. “The Translated African Cultural and Musical Past.” In *The Translated African Cultural and Musical Past*, edited by Mellonee V. Burnim and Portia K. Maultsby. New York: Routledge.
- Maxwell, William J. 2004. “Ralph Ellison and the Constitution of Jazzocracy.” *Journal of Popular Music Studies* 16 (1): 40–57. <https://doi.org/10.1111/j.0022-4146.2004.00010.x>.
- McAllester, David Park. 1954. *Enemy Way Music: A Study of Social and Esthetic Values as Seen in Navaho Music*. Cambridge, MA: Peabody Museum.
- McCarthy, Bob. 2009. *Sound Systems: Design and Optimization: Modern Techniques and Tools for Sound System Design and Alignment*. Amsterdam: Focal Press/Elsevier.
- . 2010. “Toning Your Sound System.” *Alignment and Design of Professional Sound Systems* (blog). September 10, 2010. <https://bobmccarthy.wordpress.com/2010/09/10/toning-your-sound-system/>.
- . 2016. *Sound Systems: Design and Optimization: Modern Techniques and Tools for Sound System Design and Alignment*. New York: Focal Press, Taylor & Francis Group.
- . 2020. *The Evolution of System Optimization (English)*. <https://www.youtube.com/watch?v=Uk9Ogz76glk>.
- McKittrick, Katherine. 2006. *Demonic Grounds: Black Women and the Cartographies of Struggle*. Minneapolis: University of Minnesota Press.
- McLeod, Norma. 1966. “Some Techniques of Analysis for Non-Western Music.” Phd. diss., Chicago: Northwestern University.
- . 1975. “Keynote Address.” In *Proceedings of a Symposium on Form in Performance: Hard-Core Ethnography*, edited by Marcia Herndon and Roger Brunyate, 1–17. Austin: Office of the College of Fine Arts, University of Texas.
- McLeod, Norma, and Marcia Herndon, eds. 1980. *The Ethnography of Musical Performance*. Norwood, PA: Norwood Editions.
- McMullen, Tracy. 2008. “‘Identity for Sale: Glenn Miller, Wynton Marsalis, and Cultural Replay in Music.’” In *Big Ears: Listening for Gender in Jazz Studies*, edited by Nichole Rustin-Paschal and Sherrie Tucker, 129–54. Durham, NC: Duke University Press.
- Meintjes, Louise. 2003. *Sound of Africa! Making Music Zulu in a South African Studio*. Durham, NC: Duke University Press.

- Merriam, Alan P. 1964. *The Anthropology of Music*. Evanston, Ill: Northwestern University Press.
- Merriam, Alan P., and Raymond W. Mack. 1960. "The Jazz Community." *Social Forces* 38 (3): 211–222.
- Meyer, John. 1984. "Equalization Using Voice and Music as the Source." In *Audio Engineering Society Convention 76*. Audio Engineering Society.
- . 2012. John Meyer. DVD. NAMM Oral History Program.
- . 2015. "The Leopard Project." Meyer Sound Laboratories White Paper.
- Meyer Sound. n.d. *Real World Low Mid Beam Control*. Accessed January 23, 2022. <https://www.youtube.com/watch?v=WOL4pa3nwqU>.
- "Meyer Sound: Company Philosophy." 2015. November 18, 2015. <https://web.archive.org/web/20151118014012/http://www.meyersound.com/about/philosophy.htm>.
- Milkowski, Bill. 2000. "Wynton Marsalis: One Future, Two Views." *Jazz Times*, March, 2000.
- Mills, Charles W. 1999. *The Racial Contract*. Ithaca, NY: Cornell University Press.
- . 2017. *Black Rights/White Wrongs: The Critique of Racial Liberalism*. New York: Oxford University Press.
- Milner, Greg. 2010. *Perfecting Sound Forever: An Aural History of Recorded Music*. New York: Faber and Faber.
- Mol, Annemarie. 2002. *The Body Multiple: Ontology in Medical Practice*. Durham, NC: Duke University Press.
- Monson, Ingrid T. 1995. "The Problem with White Hipness: Race, Gender, and Cultural Conceptions in Jazz Historical Discourse." *Journal of the American Musicological Society* 48 (3): 396–422.
- . 1996. *Saying Something: Jazz Improvisation and Interaction*. Chicago: University of Chicago Press.
- . 2003. "Jazz Improvisation." In *The Cambridge Companion to Jazz*, edited by Mervyn Cooke and David Horn, 114–32. Cambridge, UK: Cambridge University Press. <https://doi.org/10.1017/CCOL9780521663205.009>.
- . 2007. *Freedom Sounds: Civil Rights Call out to Jazz and Africa*. New York: Oxford University Press.

- Moreno, Jairo. 2016. "Imperial Aurality: Jazz, the Archive, and U.S. Empire." In *Audible Empire: Music, Global Politics, Critique*, edited by Ronald Michael Radano and Tejumola Olaniyan, 135–60. Durham, NC: Duke University Press.
- Moten, Fred. 2003. *In the Break: The Aesthetics of the Black Radical Tradition*. Minneapolis: University of Minnesota Press.
- Murakawa, Naomi. 2014. *The First Civil Right: How Liberals Built Prison America*. New York: Oxford University Press.
- Murray, Albert. 1970. *The Omni-Americans: New Perspectives on Black Experience and American Culture*. New York: Outerbridge & Dienstfrey.
- . 1976. *Stomping the Blues*. New York: McGraw-Hill.
- Norment, Lynn. 1994. "Wynton Marsalis: America's Most Powerful Jazz Artist Talks about His Latest Work and Lashes White Critics and Gangsta Rap." *Ebony* 49 (9): 45–46, 48, 50.
- Novak, David. 2013. *Japanoise: Music at the Edge of Circulation*. Durham, NC: Duke University Press.
- . 2015. "Noise." In *Keywords in Sound*, edited by David Novak and Matt Sakakeeny, 12–21. Durham, NC: Duke University Press.
- Ochoa Gautier, Ana Maíra. 2006. "Sonic Transculturation, Epistemologies of Purification and the Aural Public Sphere in Latin America." *Social Identities* 12 (6): 803–825. <https://doi.org/10.1080/13504630601031022>.
- . 2014. *Aurality: Listening and Knowledge in Nineteenth-Century Colombia*. Durham, NC: Duke University Press.
- Ogren, Kathy J. 1989. *The Jazz Revolution: Twenties America & the Meaning of Jazz*. New York: Oxford University Press.
- Omi, Michael, and Howard Winant. 2015. *Racial Formation in the United States*. New York: Routledge.
- Panish, Jon. 1997. *The Color of Jazz: Race and Representation in Postwar American Culture*. Jackson: University Press of Mississippi.
- Panken, Ted. 1997. "Wynton Marsalis: Interview by Ted Panken." April 14, 1997. <https://wyntonmarsalis.org/news/entry/wynton-marsalis-interview-by-ted-panken>.
- Pareles, Jon. 2004a. "For the Coolest Vibes: Accentuate Acoustics, Eliminate City Noise." *The New York Times*, May 12, 2004. <https://www.nytimes.com/2004/05/12/arts/music/for-the-coolest-vibes-accentuate-acoustics-eliminate-city-noise.html>.

- . 2004b. “For the Coolest Vibes: Accentuate Acoustics, Eliminate City Noise.” *New York Times*, May 12, 2004.
- Peake, Linda, and Richard H. Schein. 2000. “Racing Geography into the New Millennium: Studies of ‘Race’ and North American Geographies.” *Social & Cultural Geography* 1 (2): 133–142. <https://doi.org/10.1080/14649360020010158>.
- Perea, Juan F. 1997. “The Black/White Binary Paradigm of Race: The ‘Normal Science’ of American Racial Thought.” *California Law Review* 85 (5): 1213–1258.
- Peretti, Burton W. 2007. *Nightclub City: Politics and Amusement in Manhattan*. Philadelphia: University of Pennsylvania Press.
- Perlman, Marc. 2004. “Golden Ears and Meter Readers: The Contest for Epistemic Authority in Audiophilia.” *Social Studies of Science* 34 (5): 783–807.
- Piekut, Benjamin. 2009. “Race, Community, and Conflict in the Jazz Composers Guild.” *Jazz Perspectives* 3 (3): 191–231. <https://doi.org/10.1080/17494060903454529>.
- . 2012. “Sound’s Modest Witness: Notes on Cage and Modernism.” *Contemporary Music Review* 31 (1): 3–18. <https://doi.org/10.1080/07494467.2012.712279>.
- Pinch, Trevor J, and Wiebe E Bijker. 1984. “The Social Construction of Facts and Artefacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other.” *Social Studies of Science* 14 (3): 399–441.
- Pinch, Trevor J., and Frank Trocco. 2004. *Analog Days: The Invention and Impact of the Moog Synthesizer*. Cambridge, MA: Harvard University Press.
- Pinch, Trevor, J., and Karin Bijsterveld. 2004. “Sound Studies: New Technologies and Music.” *Social Studies of Science* 34 (5): 635–48.
- , eds. 2012. *The Oxford Handbook of Sound Studies*. Oxford Handbooks. New York: Oxford University Press.
- Pinkerton, John. 1814a. *A General Collection of ... Voyages and Travels, Digested by J. Pinkerton*. Vol. 16. London: Longman, Hurst, et al.
- . 1814b. *A General Collection of ... Voyages and Travels, Digested by J. Pinkerton*. Vol. 15. London: Longman, Hurst, et al.
- Porcello, Thomas. 2005. “Music Mediated as Live in Austin: Sound, Technology, and Recording Practice.” In *Wired for Sound Engineering and Technologies in Sonic Cultures*, edited by Paul D Greene and Thomas Porcello, 103–117. Middletown, CT: Wesleyan University Press.
- Porter, Eric. 2002. *What Is This Thing Called Jazz? African American Musicians as Artists, Critics, and Activists*. Berkeley: University of California Press.

- Potter, Elizabeth. 2001. *Gender and Boyle's Law of Gases*. Bloomington: Indiana University Press.
- Qureshi, Regula. 1995. *Sufi Music of India and Pakistan: Sound, Context, and Meaning in Qawwali*. Chicago: University of Chicago Press.
- Radano, Ronald Michael. 1993. *New Musical Figurations: Anthony Braxton's Cultural Critique*. Chicago: University of Chicago Press.
- . 2000. "Hot Fantasies: American Modernism and the Idea of Black Rhythm." In *Music and the Racial Imagination*, edited by Ronald Michael Radano and Philip V. Bohlman, 459–80. Chicago: University of Chicago Press.
- . 2003. *Lying up a Nation: Race and Black Music*. Chicago: University of Chicago Press.
- . 2016. "Black Music's Body Politics." In *Jazz Worlds, World Jazz*, edited by Philip V. Bohlman and Goffredo Plastino, 429–44. Chicago: The University of Chicago Press.
- Radano, Ronald Michael, and Philip V. Bohlman. 2000. "Introduction: Music and Race, Their Past, Their Present." In *Music and the Racial Imagination*, edited by Ronald Michael Radano and Philip V. Bohlman, 1–53. Chicago: University of Chicago Press.
- Rafael Viñoly Architects. 2016. "Jazz at Lincoln Center."
- Ramsey, Guthrie P. 2003. *Race Music: Black Cultures from Bebop to Hip-Hop*. Berkeley: University of California Press.
- . 2004. "The Pot Liquor Principle: Developing a Black Music Criticism in American Music Studies." *Journal of Black Studies* 35 (2): 210–223.
- . 2013. *The Amazing Bud Powell: Black Genius, Jazz History, and the Challenge of Bebop*. Berkeley: University of California Press.
- Rath, Richard Cullen. 2012. "No Corner for the Devil to Hide." In *The Sound Studies Reader*, edited by Jonathan Sterne, 130–40. New York: Routledge.
- Rational Acoustics. 2018. *Smaart v8 User Guide*. Putnam, CT: Rational Acoustics.
- Ratliff, Ben. 2004. "A Hall with Jazz on Its Mind; Basing a Season on Performers and New Works." *The New York Times*, May 12, 2004.
<https://www.nytimes.com/2004/05/12/arts/a-hall-with-jazz-on-its-mind-basing-a-season-on-performers-and-new-works.html>.
- Reich, Howard. 2002. "Unsound Design." *Chicago Tribune*, December 1, 2002.
- . 2004. "Sound Almost Lives up to Its Grand Quarters." *Chicago Tribune*, October 24, 2004.

- <http://ezproxy.cul.columbia.edu/login?url=https://www.proquest.com/newspapers/sound-almost-lives-up-grand-quarters/docview/419999786/se-2?accountid=10226>.
- Rich, Nathaniel. 2018. "When Jazz Was Dangerous." *The Paris Review* (blog). January 24, 2018. <https://www.theparisreview.org/blog/2018/01/24/when-jazz-was-dangerous/>.
- Rodgers, Tara. 2011. "What, for Me, Constitutes Life in a Sound?: Electronic Sounds as Lively and Differentiated Individuals." *American Quarterly* 63 (3): 509–530.
- . 2016. "Toward a Feminist Epistemology of Sound." In *Engaging the World: Thinking after Irigaray*, edited by Mary C. Rawlinson, 195–214. Albany: State University of New York Press.
- Rogers, Joel Augustus. 1925. "Jazz at Home." In *The New Negro: An Interpretation*, edited by Alain Locke, 216–24. New York: Albert and Charles Boni.
- Rose, Tricia. 1994. *Black Noise: Rap Music and Black Culture in Contemporary America*. Hanover, NH: University Press of New England.
- Ross, Alex. 2015. "Wizards of Sound." *The New Yorker*, February 23, 2015.
- Rustin, Nichole, and Sherrie Tucker. 2008. "Introduction." In *Big Ears: Listening for Gender in Jazz Studies*, edited by Nichole Rustin and Sherrie Tucker, 1–28. Durham, NC: Duke University Press.
- Sakakeeny, Matt. 2010. "'Under the Bridge': An Orientation to Soundscapes in New Orleans." *Ethnomusicology* 54 (1): 1–27.
- Sanchirico, Andrew. 2015. "The Culturally Conservative View of Jazz in America: A Historical and Critical Analysis." *Jazz Perspectives* 9 (3): 289–311. <https://doi.org/10.1080/17494060.2016.1257732>.
- Schafer, R. Murray. 1994. *The Soundscape: Our Sonic Environment and the Tuning of the World*. Rochester, VT: Destiny Books.
- Scherman, Tony. 1995. "What Is Jazz?" *American Heritage* 46 (6): 66–68.
- Schuller, Gunther. 1989. *The Swing Era: The Development of Jazz, 1930–1945*. New York: Oxford University Press.
- Schwartz, Joel. 1993. *The New York Approach: Robert Moses, Urban Liberals, and Redevelopment of the Inner City*. Columbus: Ohio State University Press.
- Schwenke, Roger, and Steve Ellison. 2010. "Objective Assessment of Active Acoustic System Performance."

- Seeger, Anthony. 1980. "Sing for Your Sister: The Structure and Performance of Suyá Akia." In *The Ethnography of Musical Performance*, edited by Marcia Herndon and Norma McLeod, 7–42. Norwood, PA: Norwood Editions.
- . 2004. *Why Suyá Sing: A Musical Anthropology of an Amazonian People*. Urbana: University of Illinois Press.
- Shapin, Steven, and Simon Schaffer. 2011. *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*. Princeton, NJ: Princeton University Press.
- Silva, Denise Ferreira da. 2007. *Toward a Global Idea of Race*. Minneapolis: University of Minnesota Press.
- Slaten, Whitney Jesse. 2018. "Doing Sound: An Ethnography of Fidelity, Temporality, and Labor Among Live Sound Engineers." PhD Thesis, Columbia University.
- Small, Christopher. 1998. *Musicking: The Meanings of Performing and Listening*. Middletown, CT: Wesleyan University Press.
- Smith, Dinitia. 1999. "Audience Reaction Is More Ho-Hum Than Outrage." *The New York Times*, November 3, 1999. <https://www.nytimes.com/1999/11/03/theater/audience-reaction-is-more-ho-hum-than-outrage.html>.
- Smith, Mark M. 2001. *Listening to Nineteenth-Century America*. Chapel Hill: University of North Carolina Press.
- . 2006. *How Race Is Made: Slavery, Segregation, and the Senses*. Electronic resource. Chapel Hill: University of North Carolina Press. <http://www.columbia.edu/cgi-bin/cul/resolve?clio14097717>.
- Solis, Gabriel. 2014. *Thelonious Monk Quartet Featuring John Coltrane at Carnegie Hall*. New York: Oxford University Press.
- Stengers, Isabelle. 2005. "The Cosmopolitical Proposal." In *Making Things Public: Atmospheres of Democracy*, edited by Bruno Latour and Peter Weibel, 994–1003. Cambridge, MA: MIT Press.
- Sterne, Jonathan. 2003. *The Audible Past: Cultural Origins of Sound Reproduction*. Durham, NC: Duke University Press.
- . 2012. *MP3: The Meaning of a Format*. Durham, NC: Duke University Press.
- . 2015. "Compression: A Loose History." In *Signal Traffic: Critical Studies of Media Infrastructures*, 31–52. Urbana: University of Illinois Press. <http://www.jstor.org/stable/10.5406/j.ctt155jmd9.5>.
- Sterne, Jonathan, and Roland Barthes, eds. 2012. "The Grain of the Voice." In *The Sound Studies Reader*. New York: Routledge.

- Stoever, Jennifer Lynn. 2016a. *The Sonic Color Line: Race and the Cultural Politics of Listening*. NYU Press.
- . 2016b. *The Sonic Color Line: Race and the Cultural Politics of Listening*. <https://www.degruyter.com/isbn/9781479899081>.
- Stoever-Ackerman, Jennifer. 2010. "Splicing the Sonic Color-Line." *Social Text* 28 (1): 59–85. <https://doi.org/10.1215/01642472-2009-060>.
- Strathern, Marilyn. 1991. *Partial Connections*. Savage, MD: Rowman & Littlefield.
- Suchman, Lucille Alice. 2007. *Human-Machine Reconfigurations: Plans and Situated Actions*. Cambridge, UK: Cambridge University Press.
- Sugarman, Jane C. 1997. *Engendering Song: Singing and Subjectivity at Prespa Albanian Weddings*. Chicago: University of Chicago Press.
- Tackley, Catherine. 2012. *Benny Goodman's Famous 1938 Carnegie Hall Jazz Concert*. New York: Oxford University Press.
- Taruskin, Richard. 2010. *Music in the Seventeenth and Eighteenth Centuries*. New York: Oxford University Press.
- Taubman, H. Howard. 1938. "Negro Music given at Carnegie Hall." *The New York Times*, December 24, 1938. <https://www.nytimes.com/1938/12/24/archives/negro-music-given-at-carnegie-hall-program-of-contributions-by-the.html>.
- Teal. 2014. "Posthumously Live: Canon Formation at Jazz at Lincoln Center through the Case of Mary Lou Williams." *American Music* 32 (4): 400–422. <https://doi.org/10.5406/americanmusic.32.4.0400>.
- Thompson, Emily Ann. 1995. "Machines, Music, and the Quest for Fidelity: Marketing the Edison Phonograph in America, 1877-1925." *The Musical Quarterly* 79 (1): 131–171.
- . 2002. *The Soundscape of Modernity: Architectural Acoustics and the Culture of Listening in America, 1900-1933*. Cambridge, MA: MIT Press.
- Thompson, Marie. 2017. "Whiteness and the Ontological Turn in Sound Studies." *Parallax* 23 (3): 266–282.
- Time*. 1948. "Music: How Deaf Can You Get?," May 17, 1948. <http://content.time.com/time/subscriber/printout/0,8816,798637,00.html>.
- Times-Picayune*. 1918. "Jass and Jassism," June 20, 1918.
- Tommasini, Anthony. 1999. "Defending the Operatic Voice From Technology's Wives." *The New York Times*, November 3, 1999. <https://www.nytimes.com/1999/11/03/theater/critic-s-notebook-defending-the-operatic-voice-from-technology-s-wives.html>.

- . 2013. “Wearing a Wire at the Opera, Secretly, of Course.” *The New York Times*, June 28, 2013. <https://www.nytimes.com/2013/06/30/arts/music/wearing-a-wire-at-the-opera-secretly-of-course.html>.
- Traweek, Sharon. 1992. *Beamtimes and Lifetimes: The World of High Energy Physicists*. Cambridge, MA: Harvard University Press.
- Tucker, Mark. 1993. “The Genesis of ‘Black, Brown and Beige.’” *Black Music Research Journal* 13 (2): 67–86.
- Tucker, Sherrie. 2000. *Swing Shift: “All-Girl” Bands of the 1940s*. Durham, NC: Duke University Press.
- . 2008. “When Did Jazz Go Straight?: A Queer Question for Jazz Studies.” *Critical Studies in Improvisation / Études Critiques En Improvisation* 4 (2): 1–16. <https://doi.org/10.21083/csieci.v4i2.850>.
- Vaughan, Diane. 1996. *The Challenger Launch Decision: Risky Technology, Culture, and Deviance at NASA*. Chicago: University of Chicago Press.
- Vincent, Isabel. 2020. “New York City’s Biggest Cultural Organizations among Recipients of Millions in Federal PPP Loans.” *New York Post*, July 25, 2020. <https://nypost.com/2020/07/25/nycs-richest-cultural-institutions-got-federal-covid-19-bailouts-records/>.
- Viveiros De Castro, Eduardo. 2015. *Cannibal Metaphysics*. Minneapolis: University of Minnesota Press.
- Von Eschen, Penny M. 2004. *Satchmo Blows up the World: Jazz Ambassadors Play the Cold War*. Cambridge, MA: Harvard University Press.
- Wagner, Roy. 2016. *The Invention of Culture*. Chicago: The University of Chicago Press.
- Walton, Lester A., L. H. White, A. W. K., and Lucien H. White. 1978. “Black-Music Concerts in Carnegie Hall, 1912-1915.” *The Black Perspective in Music* 6 (1): 71–88. <https://doi.org/10.2307/1214304>.
- Washburne, Christopher. 2020. *Latin Jazz: The Other Jazz*. New York: Oxford University Press.
- Weheliye, Alexander G. 2014. *Habeas Viscus: Racializing Assemblages, Biopolitics, and Black Feminist Theories of the Human*. Durham, NC: Duke University Press.
- Wetmore, Tom. 2020. “Listening as Relational Ontology in A Basement Jazz Club.” Presented at the Un/Sounding the Relational City, New York, February 28.
- . forthcoming. “‘Jazz Steel’: An Ethnography of Sound, Technology, and Race in Spaces of Live Performance.” PhD diss., Columbia University.

- Wetmore, Tom, and Steve Ellison. 2017. "Active Acoustics at the Appel Room, Jazz at Lincoln Center." *The Journal of the Acoustical Society of America* 142 (4). <https://doi.org/10.1121/1.5014245>.
- Whiteman, Paul, and Mary Margaret McBride. 1926. *Jazz*. New York: J. H. Sears, Incorporated.
- Wilson, Olly. 1983. "Black Music as an Art Form." *Black Music Research Journal* 3 (1): 1–22.
- . 1992. "The Heterogeneous Sound Ideal in African-American Music." In *New Perspectives on Music: Essays in Honor of Eileen Southern*, edited by Josephine Wright and Samuel A. Floyd, 327–38. Warren, MI: Harmonie Park Press.
- Winer, Ethan. 2018. *The Audio Expert: Everything You Need to Know about Audio*. New York: Routledge.
- Winner, Langdon. 1980. "Do Artifacts Have Politics?" *Daedalus* 109 (1): 121–136.
- Woolgar, Steve. 1990. "Configuring the User: The Case of Usability Trials." *The Sociological Review* 38 (1_suppl): 58–99. <https://doi.org/10.1111/j.1467-954X.1990.tb03349.x>.
- Wynter, Sylvia. 2003. "Unsettling the Coloniality of Being/Power/Truth/Freedom: Towards the Human, After Man, Its Overrepresentation—An Argument." *CR: The New Centennial Review* 3 (3): 257–337. <https://doi.org/10.1353/ncr.2004.0015>.
- Zipp, Samuel. 2009. "The Battle of Lincoln Square: Neighbourhood Culture and the Rise of Resistance to Urban Renewal." *Planning Perspectives* 24 (4): 409–433. <https://doi.org/10.1080/02665430903145655>.
- . 2010. *Manhattan Projects: The Rise and Fall of Urban Renewal in Cold War New York*. New York: Oxford University Press.
- Zuberi, Tukufu, and Eduardo Bonilla-Silva, eds. 2008. *White Logic, White Methods: Racism and Methodology*. Lanham, MD: Rowman & Littlefield Publishers.