Graduate Theses, Dissertations, and Problem Reports

2019

Music Technology, Gender, and Sexuality: Case Studies of Women and Queer Electroacoustic Music Composers

Justin Thomas Massey

West Virginia University, jtm0026@mix.wvu.edu

Follow this and additional works at: https://researchrepository.wvu.edu/etd

Part of the Musicology Commons, and the Music Performance Commons

Recommended Citation

Music Technology, Gender, and Sexuality:
Case Studies of Women and Queer Electroacoustic Music Composers

Justin T. Massey

A Dissertation submitted
To the College of Creative Arts
At West Virginia University

In partial fulfillment of the requirements for the degree of

Doctor of Musical Arts in
Saxophone Performance

Michael Ibrahim, DMA, Chair
Evan MacCarthy, PhD, Research Advisor
Jared Sims, DMA
Matthew Heap, PhD
Jonah Katz, PhD

School of Music

Morgantown, West Virginia
2019

Keywords: Music Technology, Electroacoustic Music, Feminist Studies, Queer Studies, New Music, Elainie Lillios, Jess Rowland, Carolyn Borcherding

ABSTRACT

Music Technology, Gender, and Sexuality:
Case Studies of Women and Queer Electroacoustic Music Composers

Justin T. Massey

This document aims to contribute to the established scholarship that highlights the role gender and sexuality has with one's fundamental relationship to composition and music technology. The profession of electronic music composition and music production are strongly associated with notions of power and control, as much of this technology was built during the World Wars and Cold War. These aggressive views have created gendered language and metaphors in the field. Metaphors are the primary way in which we accommodate and assimilate information and experience to our conceptual organization of the world. It is at the source of our capacity to learn and at the center of our creative thought. I hope to continue the discussion of language, metaphors, and various approaches to composing and working with music technology through a historical overview of women's achievements and difficulties in the electroacoustic community.

Elainie Lillios, Jess Rowland, and Carolyn Borcherding were selected to be interviewed for this document. Each interview allows them the opportunity to discuss their music, their approach to composition and their use of technology as part of their artistic process, and to discuss their roles of educators and their approach to pedagogy to further contribute to the scholarship and history of electroacoustic composers.

ACKNOWLEDGMENTS

As I look back on the last three and a half years, I would never have thought that my work with the Graduate Student and Professional Senate would be some of the most rewarding throughout my degree. I am so grateful for the trusted friendship and dedication from Lindsey McNellis. Without Lindsey's support, GPSS would not have been effective in its mission to advocate and promote graduate student life. It has been so rewarding to have a colleague and friend outside of music with whom to discuss my research. Her input has been extremely valuable and her dedication to questioning the effectiveness of our teaching and communication methods inspire me to be a better teacher every day.

Lastly, I would like to give a special thanks to Britt Trotter for her friendship throughout my entire degree. Her willingness to engage in topics of discrimination, sexism, and racism in music have helped me to navigate and acknowledge the great privileges that I bring with me and has helped encourage me to make a true difference in my approach to diversity, equality, and inclusivity within the arts.

TABLE OF CONTENTS

LIST OF FIGURES

INTRODUCTION

My interest, of course, is in honing attention, and empowering people to use the

attentional to grow, and to explore and learn with sound. [1]

-Pauline Oliveros

Our musical landscape today is scarred by the histories of silencing the innovative music

practices of women, members of the LGBTQ+ society, and people of color. Music history

textbooks often exclude these groups just referenced, and by quickly glancing at the latest

concert seasons of many of the world's leading orchestras, we can see that equal representation

of gender and minority groups in music is still missing from orchestral music programming. The

lack of historical context has allowed music composition to become defined and directed through

the lens of a white cis-male. This has a far-reaching effect on the same minorities when

composition is combined with the field of technology. The result of combining two areas so

dominated by men (music composition and audio technology) is the complete isolation or

silencing of those who do not fit the mold. Much like how John Cage's *4'33"* opened Western

music to a wider range of sounds, the melding of composition and audio technology has created

near unlimited sonic potential. However, this potential "has been taken up by some academics

and journalists to define what constitutes 'experimental' music in the broadest sense," ultimately

having the effect of silencing minority and women composers.[2]

---

[1] Pauline Oliveros and Fred Maus, "A Conversation About Feminism and Music," *Perspectives of New Music* 32, no. 2 (Summer 1994): 182.
[2] Tara Rodgers, *Pink Noises: Women on Electronic Music and Sound* (Durham, NC: Duke University Press, 2010), 10.

Electroacoustic music is a multi-faceted musical genre that uses advancements in recording and audio editing technology to create new sonorities and textures. These electronic components can function either as a standalone composition, or work in collaboration with a live musician by employing software that processes and alters the live performer's sound in real-time. While there are more definitions of electroacoustic music, Adrian Moore summarizes this term as "music which uses technology as a tool and gives the composer access to virtually any sound."[3] These sounds can be combined and utilized in recorded or live settings, with and without live performers. While composers might choose to spatialize and diffuse their pieces in real-time with a surround sound speaker array, they can also take that same composition and reduce it to a stereo playback system that one listens to on their phone. Electroacoustic music can also use live performers, using combinations of fixed media or live audio processing. This document addresses pieces and composers who work in electroacoustic music according this broad definition.

Much of the audio technology that we take for granted today was developed during times of war, particularly World Wars I and II and the Cold War. The history and development of electronic music is relatively young, with the majority of the academic electroacoustic centers in North America being built during the Cold War. The tape recorder, for example, was a tool refined by Hitler in the 1930s as part of his propaganda machine. It was not until the 1950s that it became a domestic technology used a home and in the studio.[4] During this time "electronic sounds became firmly lodged in the public imagination, especially in association with space age

---

[3] Elizabeth Hinkle-Turner, *Women Composers and Music Technology in the United States: Crossing the Line* (Aldershot: Ashgate, 2006), 5.

[4] Carol Biddiss, "Composing with the Computer: Is the Technology Gendered?," in *Repercussions: Australian Composing Women's Festival and Conference*, ed. Thérèse Radic, (Clayton, Victoria: National Centre for Australian Studies, 1995), 109.

and atomic research."[5] Male control of technology in both the academic, consumer, and engineering sides of audio technology were the norm during this time, making it extremely difficult for women to make headway in these professions. Thus, the technologies discussed in this document have inherited a sexist imagery that flows naturally into colonialist discourse.[6] Barry Truax notes how this male control "[created] a homosocial environment, similar to that found in sports and the military, where strict taboos on homosexual activity are enforced and result in expressions of homophobic denial."[7]

Scholars have begun to catalogue and to research works by female electroacoustic composers, and have published extensive interviews. Elizabeth Hinkle-Turner notes that the interest in works by women was "fostered by the celebration of the International Women's Year in 1975, and the founding of the League of Women Composers (1975) and American Women Composers Incorporated (1976)."[8] Hinkle-Turner includes an analytical discussion of approximately 150 pieces of electroacoustic music by women, while highlighting the careers and musical styles of those composers. Andra McCartney, in response to the lack of information about Canadian female electroacoustic composers, published interviews of fourteen Canadian composers.[9] Finally, Tara Rodgers has published a collection of twenty-four interviews of women who work with music technology. Her book, *Pink Noises*, and the accompanying website "makes information of music production more accessible to women and girls, and encourages

---

[5] Biddiss, 7.

[6] Rodgers, *Pink Noises*, 6.

[7] Barry Truax, "Homoeroticism and Electroacoustic Music: Absence and Personal Voice," *Organised Sound* 8, no. 1 (2003): 118.

[8] Hinkle-Turner, *Women Composers and Music Technology in the United States*, 1.

[9] Andra McCartney, "Creating Worlds for My Music to Exist: How Women Composers of Electroacoustic Music Make Place for Their Voices" (M.A. diss., York University, 1994), iv.

critical consciousness through creative uses of sound and audio technologies."[10] These three particular resources have been the fundamental inspiration for much of the dialogue that is included in this document.

While many universities are including more women and people of colour in their music history courses, ensemble programming, and guest artist series, this effort to diversify curriculums and programming has traditionally been absent. Andra McCartney has noted that there was almost no information on Canadian electroacoustic composers and sound artists in the 1990s. Composer-performers Pauline Oliveros and Pamela Z have famously been included in many articles, books, reviews, and complications, but often as the only woman in the publication and becoming a token within historical discourse. Some women reflect on their careers and note that they were not really away of the gender imbalance. When speaking about her studies in her undergrad, Elainie Lillios state "I listened to some of Pauline Oliveros's music, I knew about the composer Elaine Barkin, I had heard of Laurie Anderson…So I knew that there were women in the field, but I never thought about whether or not there was an inequality. It just wasn't part of my conscious thinking."[11]

It is important to look at these interviews through the lens of feminist and queer theory to better understand how experience of being isolated as a woman or queer person can impact how a composer works with technology, and how it influences their music and teaching style. There is no one answer, as every experience is unique, every musical work is individual, and the range of discrimination varies based on the time and location of each candidate.

---

[10] "Projects," on Tara Rodger's official website, accessed November 2, 2019, http://www.analogtara.net/wp/projects/.
[11] Elainie Lillios, Interview with Justin Massey, October 2, 2019.

Scope

The short history of electroacoustic music may have traditionally limited the voices of women and minorities, but as one looks further, they discover a multitude of composers, most of which are commonly ignored from history courses and music textbooks. Searches on the Composer Diversity Database reveal almost 1500 electroacoustic composers (women, non-binary, and people of color) from around the world.[12] Of those, approximately 700 are women from North America. In determining which composers to study and include in this document, I have drawn upon the previous scholarship of Elizabeth Hinkle-Turner, Andra McCartney, and Tara Rodgers to highlight women who have made a profound impact on the development of electroacoustic music in Canada and the United States, and have documented their struggles, their compositional process, and their relationship with music technology and composition. While this is by no means even close to exhaustive, I hope that by examining these composers and sound artists, we can further understand how difficult it can be to navigate the social construction of gender within music, and to further appreciate and acknowledge the successful careers of women and minority composers.

Elainie Lillios, Jess Rowland, and Carolyn Borcherding were selected as interview candidates to provide insight to the issues of gender diversity and LGBTQ+ representation in the electroacoustic music field, and to speak about how they approach music technology and composition despite dealing with discrimination or feeling othered in their own field by having few or no like-gendered colleagues. Lillios is a Professor of Composition and Coordinator of Music Technology at Bowling Green State University, where she provides answers that show a breadth of developed pedagogy from her over twenty years of teaching experience. A trans

---

[12] www.composerdiversity.com.

woman, Rowland shares her insights from the queer community, and is able to demonstrate the importance that intersectionality has in the discussions of gender and queer issues. Finally, Borcherding shares a more youthful critique of gender issues in music composition and technology, sharing her current experiences navigating her educational studies through her bachelor's, master's, and presently doctoral degrees.

With the limitation of three interviews, the scope of this document is confined to women and queer composers. This document therefore cannot address every viewpoint within these populations. While forms of racism, sexism, homophobia, transphobia, ageism, ableism stem from similar veins of thought, there are unique experiences, forms of aggression, and forms of silence that occur for each group. Ultimately, more research and more interviews are needed to better represent all voices and to continue to engage in a thoughtful dialogue concerning the ordeals that shape the lives of these unique composers, and how it alters their relationship to their artistic practice. This document focuses on feminist and queer issues, while it does not directly address issues faced by people of color or persons with disabilities.

Much of the sexism, and the language and metaphors centered around electroacoustic music occurs day by day. Women must navigate how they act, teach, and present themselves to function in the male-dominated world of electroacoustic music. These daily occurrences could be seen as microaggressions, however, I refrain from using this term so as to not devalue the microaggressions that marginalized and oppressed cultures endure every day. "Microaggressions are small daily insults and indignities perpetrated against marginalized or oppressed people because of their affiliation with that marginalized or oppressed group."[13] These small actions can

---

[13] Ijeoma Oluo, *So You Want to Talk About Race* (New York: Seal Press, 2018), 169. This resource is a great starting point for any person to begin to learn more about their privilege, intersectionality, police brutality, affirmative action, microaggressions, and many more issues that affect our

easily be explained away, but faced by a member of a marginalized community, these actions culminate into larger issues and negatively impact one's quality of life.[14] Racial microaggressions are serious, and can compound further issues of sexism and homophobia experienced by the women and LGBTQ+ people of color.

This document does not aim to politicize music and our institutions, rather, it is trying to address some of the most difficult issues musicians and artists confront in their artistic practice. Barry Truax state that "these aspects [of gender and sexuality] are at the centre of our lives and our ways of being in the world."[15] Addressing and discussing the difficulties that women and LGBTQ+ community face while highlighting their musical achievements is necessary for those who want to address issues of access that face these groups. It also highlights the importance of diversity and inclusivity since every musical and artistic voice is unique. Creating the space to listen to their art will teach us more about our own.

Chapter one highlights the careers of prominent women in the electroacoustic community and focuses on how experiences of being a gendered minority affects relationship to composition, teaching, and music technology. By examining the institutions of research, the pioneers who helped to establish electroacoustic centers and to develop hardware and software, as well as women who were outspoken feminists, we can recognize the significant role played by women in the development of electroacoustic music and the need to include them in our music history curriculum. Chapter two highlights previous research and interviews of women, and focuses on how gendered language and metaphors, mentors and role models, and how

---

marginalized communities, and would provide one with a great toolkit for further understanding the issues discussed in this paper regarding gender, queerness, and race.

[14] Oluo, *So You Want to Talk about Race*, 169.

[15] Truax, "Homoeroticism and Electroacoustic Music," 123.

technology is taught in the classroom affect women's relationship to music technology. Following this feminist viewpoint, chapter three features two case studies, Pauline Oliveros and Wendy Carlos, in order to demonstrate how queer theory can influence and enhance feminist studies in addition to exposing some of the discrimination that members of the LGBTQ+ community encounter. Finally, chapter four engages with broader issues through the discourse of the interviews I conducted with Elainie Lillios, Jess Rowland, and Carolyn Borcherding.

CHAPTER 1

A Brief History of Female Electroacoustic Composers

Traditional roles of women in our society have been frequently reinforced in visual and performing arts. Whether it is the female robotic voice of the computer in the *Star Trek* series being commanded by a male captain or Fritz Lang's film *Metropolis* (1927) highlighting gender and sexual stereotypes, the female body and the feminine voice have been portrayed as forces that must be controlled by men. In Metropolis, "the machine woman is evil, lustful, and powerful. She has to be destroyed in order for the 'real' woman (virginal, motherly and virtuous, therefore safe) to be set free."[1] Much like *Metropolis*, the voices of women have been limited in the development of electroacoustic music as they have been continually forced into traditional gendered roles and discouraged to pursue studies in technology or science.

The women who have managed to break through gendered barriers have been largely ignored in published historical narratives and modern musical discourse. Violence, aggression, and war are at the forefront of the destruction of the mechanized woman in *Metropolis* just as the development of audio technologies have been centered around the technological developments of the World Wars and the following Cold War. During the Cold War, electroacoustic music has become associated with the space age, atomic research, and weapons of death.[2] This foundation has created a society with male control over technology, educational institutions, and

---

[1] Andra McCartney, "Creating Worlds for My Music to Exist: How Women Composers of Electroacoustic Music Make Place for Their Voices" (M.A. diss., York University, 1994), 4.

[2] Tara Rodgers, *Pink Noises: Women on Electronic Music and Sound* (Durham NC: Duke University Press, 2010), 7.

consumerism. Women, members of the LGBTQ+ community, and people of color have had to tolerate and adapt to the norms established by cis-white men.

The comprehensive study of women's work in electroacoustic music has only recently gained momentum, with the first publication of an article devoted to women in electroacoustic music in 1983 by Beverly Grigsby.[3] Andra McCartney attributes much of her inspiration from technological gender studies from the late 1980s and early 1990s, but notes that music scholarship marginalized Canadian electroacoustic composers during this time.[4] Through her own interviews, Tara Rodgers notes that many studies and history books focus on the role of only a few women (such as Pauline Oliveros and Pamela Z), even though women have been a driving force since the start of electroacoustic music, and played pivotal roles in the development of many computer music centers in North America. This chapter highlights the profiles of institutions and women who have played a central role in the development of electroacoustic music. While not exhaustive, these profiles show some of the many contributions that are often ignored from history textbooks and curriculums while also highlighting aspects of sexism, tokenism, and homophobia that have plagued many careers.[5] By discussing these issues, I will demonstrate how traditional gender stereotypes created a male-dominated world in which many women and queer composers can feel othered. I also highlight women's accomplishments and perseverance through these societal pressures to make a lasting difference in the history of electroacoustic music. Examining the careers of these composers will reveal how the fundamental relationship one faces with music and audio technology is unique due to the

---

[3] Elizabeth Hinkle-Turner, *Women Composers and Music Technology in the United States: Crossing the Line,* Reprint ed. (Aldershot: Ashgate, 2006), 6.
[4] McCartney, "Creating Worlds for My Music," 16-17.
[5] For a more comprehensive composer listing, see Appendix A, "Selected List of Female Electroacoustic Composers.

experiences of being an outsider. These forces often reshape how one interacts with technology and composes in an electroacoustic environment.

Institutions of Research[6]

Electroacoustic music centers became the primary places for composers to work and develop new techniques for sound creation and composition. These centers were necessary due to the high cost and large size of recorders, computers, and synthesizers in the 1960s. This equipment allowed composers and sound artists to process recorded sounds by manipulating tape reels, and create new sounds altogether by programming analogue synthesizers. While this represented a new era of possibilities for composers, the male dominated aspect of technology often left female composers isolated and excluded. Many composers echo the experiences of Pauline Oliveros who stated that "when we did finally have a studio, the time that I worked there would be usually from midnight to dawn, when nobody was there."[7] This was necessary to avoid unnecessary critics from their male colleagues who would often "talk lingo which would leave [women] out."[8]

The first studio in North America to open, in 1959, was the Columbia-Princeton Electroacoustic Music Center (CPEMC). This center and the two institutions (namely Columbia University and Princeton University) attached to it accounts for many of the women pioneers in electroacoustic music.[9] While the success of this facility is credited to Milton Babbitt, Vladimir Ussachevsky, and Otto Luening, the women who were active as teachers, composers, and

---

[6] For a detailed list of the establishment of Electroacoustic Music Centers across the world from 1955-1986, see Appendix B, "Electroacoustic Music Centers (1955-1986)."
[7] Martha Mockus, *Oliveros and Lesbian Musicality* (New York: Routledge, 2008), 22.
[8] Ibid., 22.
[9] Hinkle-Turner, *Women Composers,* 16.

administrators to this center are largely responsible for the success of the facility.[10] Eventually

Princeton and Columbia University ceased their formal affiliation, with each institution forming

their separate studios in the late 1980s. During its time, CPEMC was the most significant center

for composers who wanted to learn music technology, and both Columbia and Princeton have an

impressive list of female alumnae from this affiliation.

Despite not being named faculty members at the CPEMC, composers Pril Smiley (born

1943) and Alice Shields (born 1943) worked alongside Ussachevsky and Mario Davidovsky as

the primary instructors of the facility during the 1960's and 1970's. Shield's served as a technical

instructor in the studios, and was later named the Associate Director and eventually the

Associate Director of Development. Shield earned all three of her degrees from Columbia

University, studying with Ussachevsky, Jack Beeson, Otto Luening, and Cho Wen-Chung. She

was conferred her DMA in composition from Columbia University, but was active as a technical

instructor at CPEMC during her studies. She served in this capacity from 1965 until 1982, was

named the Associate Director of CPEMC from 1978 until 1982, and finally the Associate

Director of Development from 1994 until 1996. Even after receiving her doctorate, Shields was

listed as "Science Technician II at CPEMC.[11] Although Shields was given the later titles of

associate director, these came with no more monetary compensation and did not affect her

personnel ranking in the institution.[12]

Pril Smiley is also associated with the development of the Columbia-Princeton Music

Center. She arrived to the Center in 1963 while still a sophomore at Bennington College,

becoming an apprentice to Ussachevsky, and became a technical instructor at CPEMC by the

---

[10] Ibid., 16.
[11] Ibid., 21.
[12] Ibid., 21.

time she completed her BA in 1965. She also served as the associate director from 1985 until 1995. Similar to Shields, Smiley did not earn any promotion in her personnel ranking or her wages while holding these leadership positions. Smiley was listed as a "clerk" instead of a technical director for CPEMC. While the Columbia-Princeton Electronic Music Center was a large institution with many students, faculty, and staff, it is notable that both Priley and Shields "invested many decades of work with no significant historical recognition, promotion, or compensatory gain is worthy of note."[13] While this treatment is difficult to quantify as active discrimination versus cost-cutting and exploitation in academia, the existence of the gender pay gap and lack of acknowledgement in historical discourse about these women serve to justify their treatment as forms of implicit and explicit sexism.

The University of Toronto Electronic Music Studio (UTEMS) was the second studio created in North America, shortly after CPEMC, in May 1959. Arnold Walter, Harvey Cain, and Myron Schaeffer were the original faculty members, with Hugh Le Caine serving as the technical advisor. As this was only the second electroacoustic music studio in North America, UTEMS has a large history of attracting many electronic composers from the international community, including Pauline Oliveros, John Cage, and Tzvi Avni. Three female composers stand out in the history of UTEMS, Norma Beecroft, Jean Eichelberger Ivey, and Ann Southam. Each of these women have dedicated their careers to composition, pedagogy, history, and the pursuit of continuing education in their creative mediums.

The composition program at Mills College continues to serve as an important institution today. The electroacoustic studio has been in place since 1966, but was originally founded in 1959 as the San Francisco Tape Center, with Pauline Oliveros serving as a co-organizer. Despite

---

[13] Hinkle-Turner, 21.

being a liberal woman's art college, the graduate programs at Mills College accepted male students. While Pauline Oliveros was a faculty member at Mills, she actively tried to recruit more women composers to the electronic music center. Oliveros noted that "we did get more women, but we haven't gotten enough yet. It turns out that women are not so interested in composition."[14] It was and continues to be difficult for women to see a future in music (and electronic music) composition because they see facilities and studios comprised primarily of men. Mills was different, but as Pauline Oliveros said, "it's not different enough."[15] Despite Oliveros's criticism, Mills College has an impressive list of female alumni including Maggi Payne, Megan Roberts, Jill Kroesen, Frankie Mann, Laetitia Sonami, Tara Rodgers, Barbara Golden, Magdalen Lueke, and Wendy Reid.

While most of the composers discussed in this chapter are associated with academic institutions, considerable audio research occurred in the private sector. Music research was never the primary focus of Bell Laboratories, but it housed many composers and audio engineers who have contributed significant pieces of software in the development of electroacoustic music. The MUSIC IV language was the first to be used outside of Bell Labs at universities, such as Princeton. Max Mathews and Joan Miller collaborated to release this software on the IBM 7094 computer.[16] The subsequent program, MUSIC V, was written in the FORTRAN language, making it easily transport to other computer systems.[17] While Miller contributed significantly to the development of this important software, she is frequently removed from its history. In *The Cambridge Companion in Electronic* Music, Ge Wang's chapter "A History of programming and

---

[14] Rodgers, *Pink Noises*, 32.
[15] Ibid., 32.
[16] Hinkle-Turner, *Women Composers*, 40.
[17] Ibid., 40.

Music" only discusses role of Max Mathews and John Chowning in the development of the MUSIC software, ignoring the role of women completely.[18] There were not many women involved in early digital audio research due to the gender stereotypes in place during the 1950s that did not encourage women to study in the areas of math, science, acoustics, and computer science.[19] Despite the low numbers of female engineers, Joan Miller and Linda Seltzer contributed largely to the developments in music programming and, in 1981, Seltzer was able to create an internet discussion group at Bell Lab's devoted to musical concerns.[20]

These institutions have been an important resource for electroacoustic composers. They are able to provide space and access to recorders, synthesisers, computers, and software that many composers simply would not be able to afford on their own. However, we must not forget that institutions to this day still struggle with equality of opportunity and outcome for women. The gender pay gap Pril Smiley and Alice Shields experienced still exist. The acceptance rates into post-secondary music institutions are consistently higher for men than for women, and even though women now comprise about half of the student population, they still lack the gender representation and role models within the hired faculty members.[21] Most of the composers discussed in this document cite having supportive male colleagues and male role models, but this does not provide immunity from the larger perspective gender inequality in academic institutions.

---

[18] Ge Wang, "A History of Programming and Music," in *The Cambridge Companion in Electronic Music*, ed. Nick Collins and Julio d'Escriván (Cambridge: Cambridge University Press, 2007), 58-60.
[19] Hinkle-Turner, *Women Composers*, 40.
[20] Ibid., 83.
[21] Christina Scharff, *Gender, Subjectivity, and Cultural Work: The Classical Music Profession* (New York: Routledge, 2008), 45.

Pioneers, Establishment of Electroacoustic Centers, Developments

in Hardware and Software

Pauline Oliveros (1932-2016) is best known for her *Sonic Meditations* (1970-1974) and her Deep Listening Band. Her approach to *Deep Listening* and her *Sonic Meditations* often overshadowed her work in the electroacoustic genre, but she was nonetheless a pioneer in this medium. Oliveros was both a feminist and a lesbian, with both identities informing her musical foundations and decisions. Her work in the formation of the San Francisco Tape Music Center is often overlooked. Despite helping found this center, Oliveros was still the only woman in a male-dominated center. In fact, Oliveros "struggled to educate herself" and would have to work from midnight to dawn, away from her male colleagues, in order to learn how the equipment functioned and the nature of the language used by the other men in the studio.[22] The composer was persistent and was able to hold her own in this environment in which "if you aren't a male, then there's this invisible barrier, so that you're left out of the conversation, or you're left out of a group gathering."[23] With her persistence and musical output, Oliveros served as the director of the Tape Center when it was moved to Mills College in 1966, and was a faculty member at the University of California at San Diego when the center was moved again in 1967. As a writer, she has written many articles including "Don't Call Them Lady Composers", "Software for People", "The Contributions of Women as Composers", and "Rags and Patches" that address music, philosophy, feminism, and lesbianism in the arts and music. Fred Maus notes that these articles

---

[22] Martha Mockus, *Oliveros and Lesbian Musicality* (New York: Routledge, 2008), 20-22.
[23] Ibid., 22.

address issues of feminism before the academic development of feminist music theory and

musicology, and yet remain extremely relevant to current scholars today.[24]

Jean Eichelberger Ivey (1923-2010) earned her DMA in composition from the University

of Toronto in 1972. She founded the electronic music studio at the Peabody Conservatory of

Music in 1967. This was the first studio of its kind to be established in Maryland and the first to

be located in a conservatory.[25] Ivey was a passionate educator, incorporating music technology

into workshops for primary and secondary school teachers, and stressed the importance of having

electroacoustic music courses at the university level. In fact, Ivey called for access of technology

for all of the arts.[26] In addition to her passion for education, Ivey advocated for gender equality.

When discussing the pay gap, Ivey said "It is money that can buy leisure to compose, and pay for

copyists, recordings, prestigious performances, and so many other aids to a composer's

expensive career. I cannot think of a single item or service that costs less to women."[27] When

asked by Bruce Duffie if she wanted to be known as a woman composer or simply a composer,

Ivey responded:

> I want to be a composer. I really don't care very much for the emphasis on women
> composers. On the other hand, when I'm invited somewhere here or there in connection
> with a festival of women and the arts, I usually don't say no. I am glad to have
> performances and commissions wherever they come from. But no, I don't want to be
> perceived primarily as a woman composer. I want to be a composer, and perceived as
> such."[28]

---

[24] Pauline Oliveros and Fred Maus, "A Conversation About Feminism and Music," *Perspectives of New Music* 32, no. 2 (Summer 1994): 175.

[25] Hinkle-Turner, *Women Composers*, 38.

[26] Ibid., 39.

[27] Jean Eichelberger Ivey, Hannah M. Hyatt, and Daria Semegan, "Women in Music," *Music Educators Journal* 66, no. 1 (September 1979): 7.

[28] Jean Eichelberger Ivey, "Composer Jean Eichelberger Ivey: A Conversation with Bruce Duffie," interview by Bruce Duffie, February 28, 1987, http://www.bruceduffie.com/ivey.html.

Ivey wrote most frequently for the voice, resulting in an output of vocal electroacoustic compositions. Despite her reputation as the founder of the Peabody electronic music studio, Ivey did not enjoy being perceived as solely an "electronic music composer," just as she did not want to be identified specifically as a woman composer, as she wrote for many mediums including the voice. The majority of both her entire output and her electroacoustic compositions utilize vocal performance.[29]

While Shields and Smiley were involved as faculty members at CPEMC, the center also holds an impressive list of female alumni. Notably, Judith Shatin (b. 1949) studied at Princeton and was a pupil of Milton Babbit. She received her PhD in 1979 from Princeton University and has served as faculty at the University of Virginia and is now the William R. Kenan Jr. Professor Emerita at that institution. She founded the Virginia Center for Computer Music in 1987-88 and led the program to national prominence. Shatin is also an advocate for female composers through her service as the President for American Composers, serving on the boards of the American Composers Alliance and the Atlantic Center for the Arts, and participating on the advisory board of the International Alliance for Women in Music. Shatin did believe that "her gender would negatively affect her work with music technology because her experiences at Princeton suggested to her that men in the composition program exchanged information in informal groups to which she did not belong."[30] However, her technological success came from both her supportive mentors and her ability to learn on her own. Shatin was not immediately drawn to technology, and found the laborious work of programming analog synthesizers and digital computers uncompelling. Shatin appreciated the sounds that one could produce, and found the

[29] Hinkle-Turner, *Women Composers*, 28.
[30] Ibid., 78.

work tantalizing after MIDI (Musical Instrument Digital Interface) protocol was introduced to allow computers and synthesizers to communicate with each other. All sounds for Shatin are a "never-ending source of inspiration," and she would work for a long time to truly integrate the electronic and acoustic sounds.[31] While these developments often resulted in pieces that were almost immediately obsolete, the allure of the composition process, her preoccupation with timbre, and the possibility of nearly unlimited sound worlds made electroacoustic music extremely appealing to her.

Known primarily for her device, the *Lady's Glove*, composer-performer Laetitia Sonami (born 1957) continues to serve as an import figure for female artists working with technology. Before completing her MFA at Mills College in 1980, Sonami worked with Eliane Radigue in France and notes that "[they] became very close friends, one of those friendships that change the directions of your life."[32] Sonami was unable to work at the Groupe de Recherche Musicale (GRM) in Paris because she did not have a proper conservatory training. After only one meeting, Eliane Radigue provided Sonami with her personal equipment at her small home. Through Radigue's encouragement, Sonami left France to study at the University at Albany and in 1978, arrived at Mills College. During her time at Mills, Sonami would surround herself with those who knew more about technology than she did. Her goal was to always try, to always do something, because if "it [is] totally wrong, there will be ten guys saying, That's not the way to do it!" [33]

The *Lady's Glove* was first created in 1991, with the first version being built from a pair of rubber kitchen gloves with transducers glued to the fingertips. The glove would detect

---

[31] Colin Clarke, "Time to Burn: Judith Shatin in Conversation." *Fanfare* (July/August 2014): 190.
[32] Rodgers, *Pink Noises*, 227.
[33] Ibid., 228.

movements, convert the data to MIDI information, and then use synthesizes or software to create the sounds. The current model of the glove interfaces with the software Max/MSP and is mapped to a variety of sound parameters selected by the composer. While there were other devices available in the 1990s to choose from, Sonami opted to create her own feminine version, and "stresses the sensuality and 'sexiness' of her device" compared to the other versions.[34] While not addressing specific issues of sexism, Sonami's experiences demonstrate the importance and influence of having like-gendered role models, and highlights a successful career from a technological device in which she has feminized. By addressing the concepts of sensuousness and sexiness, and by initially using the "perfect housewife's tools"[35] (rubber kitchen gloves), Sonami challenges the male-dominated technology industry and proves to be a successful role model to this day.

Composer Laurie Spiegel (born 1945) has been involved in both electroacoustic research and composition, working at Bell Laboratories in 1973. She has written her own software, including the computer program Music Mouse for the Macintosh computer in 1986. Spiegel is an active freelance musician and composer, and has also held teaching positions at Cooper Union for the Advancement of Science and Art and New York University.[36] Frustrated by the lack of memory and storage of analog systems, Spiegel became attracted to the math and logic required for computer programming, drawing her to Bell Laboratories. Spiegel spoke about her time at Bell Laboratories as having a "wonderful atmosphere" since "there seemed to be a fair number of women scientists around."[37] This environment was also cultivated by the openness towards

---

[34] Hinkle-Turner, *Women Composers*, 91-92.
[35] Ibid., 91.
[36] Mary Simoni, "Profiles of Determination," *Computer Music Journal* 22, no. 4 (Winter 1998): 20.
[37] Ibid., 24.

music at Bell Labs. There was not a specific artistic direction compared to the male-dominated university studios, in which Spiegel "doubted that [she] would have been granted the same level of access…during that period."[38]

Even in more sophisticated musical contexts, women will often be offered help and given basic explanation to audio technology despite having a thorough understanding of the audio hardware, software, and processes. Despite her positive description of her time at Bell Labs, Laurie Spiegel had to continually navigate these forms of sexism. She would have difficulties buying electronic equipment at commercial stores, as salesmen would insist that she provide them with a list since "they seemed sure that [she] had to be buying the parts for someone else."[39] In the face of these gender stereotypes, Spiegel disregarded the actions of men towards her, saying that "gender stereotyping was not a big deal to me personally."[40] Spiegel was a dedicated composer who worked tirelessly in the study of composition to be able to succeed in the education system. She states that her experiences were based in her work, and that social interactions were not a concern for her. This dismissal of gender stereotyping misplaces the fact that both composition and technology are a male dominated field. Spiegel's dedication to become a successful composer (outside of technology) was also affected by implicit gender biases in the field of music composition.

Access to post-secondary institutions has traditionally been an issue for women, including women electroacoustic composers. The first woman admitted to the Princeton Graduate School, in 1962, was Ruth Anderson (born 1928). While she credits Ussachevsky for opening creative doors for her composition, she really cites Pauline Oliveros and Annea

---

[38] Ibid., 24.
[39] Ibid., 25.
[40] Ibid., 25.

Lockwood as leading her to her true musical expression.[41] When planning the equipment purchase for the creation of a new electroacoustic studio at Hunter College, Anderson wrote and sought the advice of Oliveros. Even with her knowledge, experience, and abilities, Anderson was fired for being too far out of the mainstream after she arranged for funding from the New York Board of higher Education for Hunter College's studio.[42] She was rehired in 1968 and provided the funds to construct the facility. Sources do not disclose any further details over what constituted these actions. The low admission rate, gender pay gap for faculty, and the lack of promotions for women can lead to situations in which they lose their jobs without the security of a tenured academic position in a university.

In addition to the prevalent forces behind the formation of electroacoustic centers across North America, female composers faced constant barriers to accessing equipment (often in the very studios they founded or co-founded) without facing blatant attacks of gender stereotyping and sexism. These women faced longer working hours, less pay, and less access to like-minded colleagues, and yet they "were able to create worlds for their music to exist, within a territory in which the electroacoustic composer is gendered male."[43]

Academics, Performers, Outspoken Feminists

As musicologists and researchers aim to rectify and highlight the silenced voices of women and minorities in music history, we have more interviews and research articles dedicated to the careers and histories of female electronic music composers. Norma Beecroft, Anne Southam, and Pamela Z have all experienced the feelings of isolation from being a woman in a

---

[41] Hinkle-Turner, *Women Composers*, 31.
[42] Ibid., 29.
[43] McCartney, "Creating Worlds for My Music to Exist," 7.

prevalently male world. Women generally remember this experience vividly, and often comment about their differing approach to music technology when faced with the gendered language used by men in the studio.

Norma Beecroft (born 1934) is a composer and radio producer. She began her studies at the University of Toronto in 1962, entering into the class of Myron Schaeffer. She had strong connections with the Canadian Broadcasting Corporation (CBC) as her broadcasting career began in television. The CBC had donated equipment to the University of Toronto, making this a fruitful connection for Beecroft's acceptance into the program. She published her book, *Conversations with Post World War II Pioneers of Electronic Music,* in 2015. This book features twenty-three interviews that Beecroft conducted in 1977 which are also available as a podcast from the Canadian Music Centre's website. Alexa Woloshyn notes that the gender disparity is evident in this book, as all twenty-three composers interviewed are men. "However, it is Beecroft's voice in text and more powerfully in the audio files, juxtaposed against the voices of over twenty men, that highlights this divide."[44] It was Beecroft's knowledge, passion, and experience as a composer and broadcaster that allowed her to conduct these insightful conversations.[45] It is also interesting to note that women are mentioned in these interviews, including Nadia Boulanger, Pauline Oliveros, Roslyn Brogue Henning, and Daphne Oram, showing the strong influence of women role models and mentors in the face of the persistent gender disparity in electronic music history. In addition to these invaluable interviews, Beecroft has also taught electronic music and composition at York University (Toronto), has served as the

---

[44] Alexa Woloshyn, Robin Elliott, and Sophie Stévance, "Norma Beecroft. 2015. Conversations with Post World War II Pioneers of Electronic Music," *Intersections* 36, no. 1 (2016): 103-104.
[45] Ibid., 103-104.

President of the Canadian Music Associates, is a member of the Canadian League of Composers, and is an associate of the Canadian Music Centre.

A politically active and engaged feminist, Canadian composer Anne Southam (1937-2010) helped found and served as the first president of the Association of Canadian Women Composers (ACWC) in 1981, an organization that continues to thrive today. While Southam was independently wealthy, she continued to endure the same criticisms and difficulties as her female colleagues. She faced hardship from "growing up gay in the 1950's."[46] Receiving critical acclaim and high profile commissions, Southam still struggled with self-doubt and remained modest about her work throughout her career.[47] Southam studied at UTEMS with Gustav Ciamaga from 1960 to 1963. She spoke of the "'wilderness of sounds' that could be created in electro-acoustic music." A pioneer of this medium, Southam taught electroacoustic music at the Royal Conservatory of Music in Toronto from 1966 to 1976, and promoted electronic music to elementary and high school students throughout Toronto through the Artists in the Schools Program of the North York Board of Educators.[48] A queer feminist, Southam became frustrated with the persistence of gender stereotypes in contemporary dance and music, and become pivotal to the establishment of contemporary dance in Canada.[49] She described her minimalist style through a metaphorical feminist lens. While it may not be perceptible to the audiences' ear, she spoke how "process music, built on repetitions and incompatible with structures conveying heroic drama as a perfect way of connecting with the repetitive but life-sustaining tasks that have traditionally been assigned to women…activities that require great patience and often leave

---

[46] Tamara Bernstein, "Southam, Ann," *Grove Music Online* (2013): 2.
[47] Ibid., 2.
[48] Ibid., 2.
[49] Ibid., 2.

nothing to show for it."[50] Southam's dedication to helping women in poverty and women and girls facing violence continues today through a $14 million gift to the Canadian Women's Foundation, creating a permanent endowment, the Ann Southam Empowerment Fund, that has allowed the foundation to double its efforts.[51]

A multimedia artist who combines performance, voice, live electronics, video, and visual art in her work, Pamela Z (born 1956) is an artist who explores musical process over product.[52] Z's first interaction with recording technology (like many others) came when she was given two Craig cassette tape recorders as a kid. She would bounce back and forth between the two recorders to create overdubs and eventually made fake radio shows.[53] Her true exposure to electronic and experimental music, however, came later when she went to a *Weather Report* concert and heard Jaco Pastrorius use a digital delay.[54] The next day she bought an Ibanex one-rackspace, one-second digital delay saying that "I took it home, and it literally changed my life."[55] As technology became more powerful, Z was able to acquire more digital delays that were capable of handling longer durations of sound (more than just one second), and today now uses programmed software in the Max/MSP audio coding environment to run her delays. She also uses the "Body-Synth" which is wearable technology that converts her motions to MIDI data, allowing her movements to change sonic parameters and trigger sounds within the audio

---

[50] Ibid., 6.

[51] David Graham, "Musician Ann Southam Leaves $14M to Canadian Women's Foundation," *The Star,* October 25, 2011, https://www.thestar.com/news/gta/2011/10/25/musician_ann_southam_leaves_14m_to_canadian_womens_foundation.html.

[52] Jennifer Kelly, *In Her Own Words: Conversations with Composers in the United States*, (Chicago: University of Illinois Press, 2013), 211-212.

[53] Rodgers, *Pink Noises*, 216-217.

[54] Ibid., 217.

[55] Ibid., 217.

software she uses. Z notes that her first forays into the electroacoustic world involved

commercially available devices.[56] She did not pursue work at any of the institutions noted above.

While Z regularly mentions how she would usually be the sole woman on electroacoustic

compilations CD's, represented as a token, she is more interested in her process of working with

the technological tools and would prefer to "be represented in the general populace instead of

seen in the scene as a female artist – like a token."[57] Her process involves struggle and

experimentation, using trial and tribulations to discover new sounds and processes by forcing

herself to overcome technological obstacles. The art is not always a measure of technological

savviness, Z notes the "low tech" use of a hand fader to control the brightness of Christmas-tree

lights that were in her hair. She was not trying to trick the audience, but reflected that "because

of [her] reputation and because of what [is] possible today, that [the audience] would probably

assume that it was some pitch-to-MIDI controller, and [her] voice is controlling the lights." [58]

With such a distinguished career, Z has been interviewed and studied by many

musicologists. She focuses on her music, but is also unafraid to comment about issues of gender

and race. "Women, she states, are expected to excel in the use of the voice, and so are rewarded

the most when they perform vocally."[59] The female voice and body being used to entertain, to

persuade, and to conquer are a common and comfortable theme in western culture. Z expands on

this issue by reframing the question from a different perspective. While continually being asked

about there being a feminine voice, she states:

> The more interesting question to me is, Is there something special about male music?
> Because no one ever asks it from that angle. No one ever says, "Well, what is male music
> like?" For instance, Eric Singer with all his robots, It's probably no surprise that Eric

---

[56] Kelly, *In Her Own Words*, 214.
[57] Ibid., 222.
[58] Ibid., 217.
[59] Hinkle Turner, *Women Composers*, 135.

Singer is a guy, that the person who's famous for doing the robots is a guy and not a girl.[60]

Pamela Z continues to have a successful career as a performer-composer. Her unique traits as a multimedia composer run counter to that of the male academic composer. She works with technology, voice, improvisation, written scores, video, and artwork installations. She serves as an important role model for many composers, regardless of gender, due to her success, outspokenness, and continued work to create avant-garde, interdisciplinary works.

Performer, composer, inventor, physicist, philosopher, and stargazer Wendy Carlos (born 1939) brought electronic synthesizers into the public spotlight with her record *Switched-On Bach.* Her recordings of Bach's music on a custom Moog synthesizer sold over one million copies, giving it a RIAA certification as a platinum record in 1986.[61] A trans woman, Carlos completed her graduate studies at Columbia University, earning her MA in 1965. Never satisfied with the experimental sounds and styles coming from academic institutions, she turned to and found success working in the commercial music industry, completely outside of the institutional world of electronic music.[62] She noted that when she tried to compose "anything like a melody or a recognizable chord progression…it was all considered demeaning and laughable and not nearly serious enough," and that the music coming from Columbia University was "fairly forgettable and kind of hateful…created with a lot of arrogance and pomposity."[63] Despite her dislike of this music, Carlos was encouraged by Vladimir Ussachevsky to get a job in a recording studio and support herself by working as an audio engineer. Her work on the technical side

---

[60] Kelly, *In Her Own Words*, 223.
[61] Thom Holmes, *Electronic and Experimental Music* (Oxfordshire, UK: Taylor and Francis Ltd, 2003), 167.
[62] Ibid., 162.
[63] Ibid., 158.

included making demos and led to her work with Robert Moog and his new synthesizer in 1966. Carlos's experience and her spoken interviews regarding how coming out as a trans woman and her gender affirmation surgery impacted her life and music will be discussed more in chapter three.

Conclusion

The composers listed above represent only a small fraction of the achievements that women have made within the genre of electroacoustic music. Despite facing gender stereotypes that discouraged their participation in technology, and issues arising from representation, equal pay, and equal promotion, women have been critical to the development of electroacoustic music. Access to technology is an issue that is changing rapidly in the twenty-first century. No longer are composers and musicians tied down by large, expensive, and slow machinery to compose electronic music. The development of powerful laptop computers, tablets, and smartphones have altered the power structure. Despite the advancements of hardware and software, many of the traditional gender stereotypes, including the language and metaphors we use when teaching and working with audio technology, remain. As the next chapter discusses, these gender stereotypes and the general visibility of women still contribute to representation and inclusion of women in the electroacoustic music genre.

Electroacoustic music composition is a double-edged sword. The combination of two male-dominated areas creates and atmosphere that can be lonely and difficult to navigate for any woman, queer person, or person of color. This chapter addresses issues of sexism, isolation, and recognition to show that in the face of difficulty, women succeed through an interdisciplinary and collaborative approach to their music and audio technology. Carlos's work with Robert

Moog, Z's intricate use of gesture, MIDI mapping, and video, the administrative and grant work done by countless women to open new electroacoustic centers, and the work of Anne Southam and Jean Eichelberger Ivey to promote women's technology studies demonstrate how some of the most unique and creative ideas flourish from breaking out of the mold and stereotype that is slow to change in this artistic medium.

CHAPTER 2

Language and Stereotypes, a Feminist View of Electroacoustic Composition

Python, one of the most popular and most widely used programming languages, recently removed the terminology "master" and "slave" from its library, a set of predefined functions or objects built into the Python program itself. These terms referred to components that either controlled other components, or those that were being controlled and were replaced with "workers" and "helpers." The original expressions are problematic due to their association with slavery in the United States. Language such as this can be construed as insensitive and problematic in its historical usage, particularly when minority groups, especially African Americans, study and enter the technology workforce. Regularly hearing and utilizing language that discriminates or isolates a specific group of people normalizes terminology that excludes and reinforces inequity. This example demonstrates the ways that the language we use, particularly the metaphors, to discuss technology and programming can and should be altered to be more inclusive. While there was much discussion about altering the technical terms "master" and "slave," the result is a positive step toward promoting inclusivity and diversity in this technological programming language.

The steady development of audio technology, first in the form of analog recorders, saw further refinement in the 1930s as part of Hitler's propaganda machine.[1] After World War II and throughout the cold war, we see the development of the synthesizer and its rise to popularity with

---

[1] Carol Biddiss, "Composing with the Computer: Is the Technology Gendered?," in *Repercussions: Australian Composing Women's Festival and Conference*, ed. Thérèse Radic (Clayton, Victoria, Australia: National Centre for Australian Studies, 1995), 109.

Wendy Carlos's *Switched-On Bach* in 1968. The development of the digital computer gave rise

to audio software and the Digital Audio Workstations (DAWs) that were created alongside music

programming languages such as Supercollider (1996), Max/MSP (1985), and Pure Data (1996),

giving way to home studios and more refined digital recording studios in the 1990s.[2] While these

inventions have always been associated with technical innovations, "historians have long

suggested that technological innovators, including the designers of electronic computers, also

invent the kind of people they expect to use their innovations."[3] Invention and innovation,

regardless of the field of study, is then a contested social process. The dominance of the male

electroacoustic composer has thus created a hierarchy that silences women and minority

composers, and continues to operate through the present day. This chapter explores some of the

stereotypes that face women in the electroacoustic field, and how they have and continue to

navigate these barriers to create unique music, relations, and approaches to electroacoustic

composition.

Gendered Language and Metaphors

Metaphors are essential to how we teach and understand music and are often used in

performance, theory, composition, and musicology studies. Andra McCartney notes "that

metaphor has the cognitive function of establishing concepts and categories, enabling us to

---

[2] For further reading, see Wang Ge, "A History of Programming and Music," in *The Cambridge Companion in Electronic Music*, ed. Nick Collins and Julio d'Escriván (Cambridge; New York: Cambridge University Press, 2007), 55-86; Roger Dean, ed., *The Oxford Handbook of Computer Music* (Oxford and New York: Oxford University Press, 2009).

[3] Simon Ensmenger, *The Computer Boys Take Over: Computers, Programmers, and the Politics of Technical Expertise* (Cambridge: The MIT Press, 2010), 13.

understand a new domain of experience by relating it to a domain that we already know."[4] Metaphors are particularly powerful when we are describing abstract processes, which can be at the heart of music composition and performance. This chapter addresses the issues that arise when the metaphorical language of electroacoustic composition expresses implicit and explicit biases towards women and minority groups. This language is often fundamental to the ways in which we discuss music and technology. Terminology has evolved with technology and western art music to create a gendered language, one that isolates women and makes them feel uncomfortable throughout their careers. These phrases, terms, and metaphors can be found everywhere, from our dialogues and conversations with our teachers and colleagues, to advertisements of music technology, software, and hardware, to the language used inside programs themselves.

Composer Wende Bartley (born 1951) describes some of the shocking language used in describing electroacoustic technologies. She was at a disk-swapping party in Toronto when a colleague who was fascinated by her sampled sounds stated "Oh, I've got to rape that disk."[5] This metaphor is obvious in its gendered implications, and has fallen out of favor with the development of digital file sharing (as opposed to floppy disks, tapes, or CD's). During this time, it was a metaphor used without thinking about its consequences. This violent and sexual metaphor is not the only one. McCartney states that the word "rape" was used to reference stripping down hardware in the December 1991 issue of *Keyboard Magazine*.[6] Other advertisements have included "Stalking the Power of Synths," and the Rhodes piano as an

---

[4] Andra McCartney, "Creating Worlds for My Music to Exist: How Women Composers of Electroacoustic Music Make Place for Their Voices" (M.A. diss., York University, 1994), 49.
[5] Ibid., 49.
[6] Ibid., 59.

"abortion instrument."[7] These examples demonstrate the male dominant perspective of an entire industry, one that academic institutions and freelance composers must be tied to in order to have access to the equipment to compose electroacoustic music.

Tara Rodgers draws a connection between the terminology used frequently today to the development of technology through the military. Sound, communication, and audio technology all share a common use during wartime. In World War II, the development of audio technologies to control sound and safeguard communication increased in magnitude dramatically, developing into the basic sound technologies that we use today. The development of electronic music and particularly space age pop led to an association of electronic music with atomic research and weapons of death during the Cold War.[8] Essentially, the already male domain of composition became fused and associated to war, violence, and aggression by this association with military action. Electronic music is thus a combination of two male domains, composition and technology, that attempts to "make music with weapons of death."[9] Discussing the usage and continuation of this aggressive and violent language, Tara Rodgers states:

> These associations persist today in the terminology of electronic music: DJs "battle"; a producer "triggers' a sample with a 'controller,' 'executes' a programming 'command,' types 'bang' to send a signal, and tries to prevent a 'crash.' The very act of making electronic music thus unfolds with reference to high-tech combat, shot through with symbols of violent confrontation and domination.[10]

By realizing the nature of our language and the blatant sexist metaphors that exist (like the metaphors Wende Bartley experienced first-hand), one can see that terminology and metaphors can create barriers for women entering the field of electroacoustic music. Being faced directly

---

[7] Ibid., 57-58.

[8] Tara Rodgers, *Pink Noises: Women on Electronic Music and Sound* (Durham NC: Duke University Press, 2010), 7.

[9] Ibid., 6.

[10] Ibid., 6.

with such language can elicit different emotions and responses from any individual.

Additionally, experiencing aggressive, gendered, and sexist language while being the minority

gender in a room sexualizes the content, providing for an awkward atmosphere that women must

carefully navigate. The following table shows some of the language used to describe audio

software and hardware.

Figure 1 – Examples of Gendered Language and Terms

Terms used in software:[11]

Master	Slave	Controller	Kill	Execute
Trigger	Bang	Crash	Split	Command
BangBang	Closebang	Splice	Battle	Drunk

Language Used in Commercial Advertisements:[12]
Stalking the Power Synths (1988)
Using a hardware sequencer is a lot like driving a tank (1988)
Sampler Wars. It's the music industry's equivalent of an All Star Wrestling battle-royal; a knock-down, drag-out digital mud-slinging marathon. (1991)
Two ways to get a killer drum sound. (1993)
Play it. Stretch it. Squash it. Clone it. Loop it. Punch it. Drag it. Zoom it. (no date provided)
Imagine getting slammed in the chest with a sledgehammer. (1994)
If you're interested in unrivaled sound quality, remarkable performance flexibility and perhaps world domination, we suggest the JD-800 (1991)

Feminist scholars have been at an impasse regarding questions that try to find distinct

differences between composition by women and men.[13] Instead, the focus has become on how

women work in a male domain, how they continue to compose, perform, and innovate despite

facing implicit and explicit sexual confrontations. Andra McCartney states:

---

[11] Ibid., *Pink Noises,* 7.
[12] McCartney, "Creating Worlds for My Music," 53-57.
[13] Hannah Bosma, "Musical Washing Machines, Composer-Performers, and Other Blurring Boundaries: How Women Make a Difference in Electroacoustic Music," *Intersections: Canadian Journal of Music* 26, no. 2 (2006): 1.

Placed in the position of the "lack" (the Other, the one to be controlled) and performing in the position of the composer (the active, controlling agent) women composers of electroacoustic music resist the categories that place them in this paradoxical position, and struggle to think of their relationship with computers in different ways.[14]

My document challenges the commonly used phrase that music is a "universal language" that transcends language and culture. The large-scale discrimination that occurs in electroacoustic music is a blend of issues that face the broader subjects of composition and technologies studies as well. Male dominance in music and the aggressive and sexist language used in its discourse create and exclusive system that, often unintentionally, creates conflict and inequity. "While her male counterparts might already be automatically endowed with the title 'composer' a female musician in the same profession must first work to drop the gendered form of this title in favour of what is characterised as a neutral but is really a male term – 'composer.'"[15] The consequences of the women who manage to achieve the status of "composer" of having "their differenced [as] valued so they can stand as symbols of equality, but it is also diminished in order that they become subsumed into the male discourse of material."[16]

Musicians use problematic language to teach, describe, promote and even discourage musical discourse. Through the many interviews conducted by Andra McCartney and Tara Rodgers, many women show a similar use of language when discussing their artistic practice. They "focus on the tensions between compositional and technological restrains and freedom: freedom from stylistic boxes, freedom to move and breathe, freedom to enjoy the work."[17] In other words, there is a space within electronic music discourses between humanity and

---

[14] Andra McCartney, "Inventing Images: Constructing and Contesting Gender in Thinking About Electroacoustic Music," *Leonardo Music Journal* 5 (1995): 63.
[15] Lauren Redhead, "'New Music' as Patriarchal Category," in *Gender, Age, and Musical Creativity*, ed. Catherine Haworth and Lisa Colton (Farnham, UK: Routledge, 2015), 175.
[16] Redhead, 176.
[17] McCartney, "Creating Worlds for My Music," 79.

technology, male and female, nature and war.[18] As society and academia continue to struggle with issues of sexism, racism, and homophobia, and become more aware of the implicit biases that plague our systems and institutions, these new worlds of sound and new relationships to music and audio technology are created, perhaps ever moving closer to our metaphorical "universal" language.

Gendered stereotypes, language, and metaphors that are associated with music technology create an environment "that is male dominated and strongly associated with notions of power and control."[19] The technology used by many of the composers above has been largely developed through recording studios and the music production industry. Paula Wolfe notes that this profession remains one of the most white-male dominated industries worldwide.[20] What is particularly interesting is that the reasons behind this gendered imbalance remain unknown. Scholarship studying the gender imbalance in music production notes that "no one had an explanation as to why men dominate in this industry, other than the traditional factors."[21] One can draw a conclusion that the traditional stereotypes of men and women continue to hold true today, discouraging women from entering fields that include technology.[22]

---

[18] Rodgers, *Pink Noises*, 9.

[19] Paula Wolfe, "A Studio of One's Own: Music Production, Technology and Gender," *Journal on the Art of Record Publication*, no. 7 (2012): 1.

[20] Wolfe, 1.

[21] Ibid., 1.

[22] For in-depth information regarding the gendering of music education and its impact on women entering the field of technology include Victoria Armstrong, *Technology and the Gendering of Music Education* (Surrey, England: Ashgate Publishing Limited, 2011); Andra McCartney, "New Games in the Digital Playground: Women Composers Learning and Teaching Electroacoustic Music," *Feminism and Psychology* 12 (May 2002): 160-167; Paula Wolfe, *Women in the Studio: Creativity, Control and Gender in Popular Music Sound Production* (New York: Routledge, 2020).

Mentors and Role Models

Professor-student power dynamics and the diversity of students in studios and classrooms has a large impact upon minority student populations. The ability to learn from or learn with a colleague or teacher who has shared experiences is crucial, especially in the support of women in music technology.[23] It can be life-changing when one discovers a successful, like-bodied person in their field as evidenced by McCartney:

> I find the music and the stories of these [women] composers [of electroacoustic music] to be inspiring. Others do, too. Every time I give a presentation on this study, at least one woman comes forward afterward and confesses that she had almost given up on studio work, but that hearing these stories has given her the courage and motivation to continue.[24]

Many women who have been successful composing with sound technologies cite experiences of informal mentoring while young, when "a relative or family friend who provided access to technology and training in its use, whose influence may have worked against pervasive cultural messages that tell boys to tinker and girls to relate."[25] Early role models serve as "second persons" who demonstrate that knowledge emerges out of dialogue and negotiation.[26] Second persons are equally important during the later years of education, and especially during undergraduate and graduate studies. Major professors guide students in their styles and musical choices, but also provide suggestions as to who and where their students should go for further studies. Many of the alum from CPEMC cite Vladimir Ussachevsky as a positive influence who spurred and challenged their creative interests. But, as Frances White acknowledges, there are many composers who are important influences, but role models are more difficult to find and

---

[23] Chloe Stamper, "Our Bodies, Ourselves, Our Sound Producing Circuits: Feminist Musicology, Access, and Electronic Design Practices" (M.F.A. thesis, Mills College, 2015), 25.
[24] Bosma, "Musical Washing Machines," 102.
[25] Andra McCartney and Ellen Waterman, "Introduction: In and Out of the Sound Studio," *Intersections* 26, no. 2 (2006): 6.
[26] Ibid, 6.

identify. She herself stated that "there were very few female composers that I could look on as models, so while I had many wonderful and supportive (male) composition teachers, this was a bit of an issue for me."[27]

"For me it was permission. Permission to do what I'd already been doing, and been interested in."[28] Role models serve as a gateway to pursue one's ambitions. This is especially important for any group or culture that has been ignored, supressed, or treated unequally in society. Seeing a role model of the same gender, color, or sexual orientation is evidence that it is possible to be successful in your field. As many women have stated in interviews, there are fewer like-bodied role models to influence them. Chloe Stamper sums up the importance of role models in her dissertation:

> Role models serve crucial roles in the support of women in music technology and electronic instrument design. The research of Buck, Clark, Leslie-Pelecky, Lu, and Cerda Lizarraga expounds the importance of available role models, stating that, when the person observes others with similar characteristics perform skills successfully, or act in a manner that produces what they view as desirable results, their expectation about their own ability to perform the task and desire to act in a certain manner are reinforced. Sex-stereotypical images of careers involving technology serve to limit women's career aspirations, making it especially important for women to have access to positive role models.[29]

The women who have been lucky to have a direct female mentor recount this as a major influence in their musical lives. Brenda Hutchinson, Laetitia Sonami, and Afroditi Psarra, all refer to their female mentors as special, influential, and inspirational. This is not to say that men cannot serve as incredible educators or role models to women, but instead is acknowledging that there are different forms of support that like-gendered role models can support through an

---

[27] Frances White, "5 Questions to Frances White (Composer)," interview by Xenia Pestova, February 26, 2013, https://www.icareifyoulisten.com/2013/02/5-questions-to-frances-white-composer/.

[28] Stamper, "Our Bodies, Ourselves, Our Sound Producing Circuits," 71.

[29] Ibid., 25.

unconscious connection due to having similar experiences and knowing how to provide this kind of support.[30]

The history of ignoring or not acknowledging female electroacoustic composers has resulted in a lack of access to female role models and mentors. While many of the composer mentioned in chapter one did not have access to these mentors, they did cite the positive influences of their male colleagues, role models, and mentors. Cross-gender mentorship pairs have proven to be very successful and beneficial, but these do come with additional difficulties including stereotyped threats, sexual and intimacy concerns, and peer resentment.[31]

Music Technology in the Classroom

As discussed in chapter one, academic institutions account for much of the development of electroacoustic music. Composers are often associated with the institutions where they studied, visited, or worked at when examining biography and, to a certain extent, musical styles. Institutions play a vital role in the development of music technology, the genre of electroacoustic music, and also the neglect of gender and racial equality and access. It is appropriate to discuss how pedagogy and the classroom atmosphere influences the ability for women composers to study electroacoustic composition.

Many of the composers interviewed in studies by Andra McCartney, Tara Rodgers, and Elizabeth Hinkle-Turner mention that they have experienced feelings of isolation while being the only woman in a classroom, or one of only a small handful of women in a classroom otherwise full of men. When women enter into an electroacoustic course, they become the minority. With

---

[30] Ibid., 56.
[31] Ibid., 40.

little to no like-bodied colleagues and alienating language, these composers reported that they would remain silent, were ill at ease with the equipment, or considered dropping out of their music technology courses. McCartney's research of music technology courses in Ontario universities (in the 1990s) notes that "in the introductory [music technology] courses twenty-five percent of the students were women, only four percent of the advanced students were women."[32] Climates created from such large gender gaps can provide a feeling of incompetence or marginalization when a female or minority student has difficulties with the course material or technology.[33] These feelings lead to high rates of dropout and general discouragement to continue work in music technology and electroacoustic music composition.

The concept of physical space and technology may seem neutral, but that neutrality comes at the ignorance of history and complete disregard for the power structures that has been established in these areas. Power structures emerge from the professor having control over the students' grades and even potentially professional social circles. Gender becomes an important aspect when combined with class, race, and sexual orientation in a space such as a classroom that has this direct power structure. The culmination of technology into this environment means adding in cultural assumptions that are often ignored.[34] This can lead to a situation in which "girls are socialized to pursue, for the most part, relational, analogic ways of knowing, but they must unlearn these ways in order to be successful with technology. Thus, girls are set up for failure on some level as they confront technology and are measured by a male norm."[35]

---

[32] Andra McCartney, "New Games in the Digital Playground: Women Composers Learning and Teaching Electroacoustic Music," *Feminism and Psychology* 12 (May 2002), 162.
[33] McCartney, 162.
[34] Virginia Caputo, "Add Technology and Stir: Music, Gender, and Technology in Today's Music Classrooms," *The Quarterly Journal of Music Teaching and Learning* 4, no. 4 (Winter/Spring 1993): 87.
[35] Ibid., 88.

Classroom power dynamics are further stressed through sexist language and metaphors used by professors and other classmates that can sexualize class content and make women feel uncomfortable, especially in one-on-one settings with their professor, or when they are simply one or a few women among a classroom full of men. Some of the quotes found in the following figure display clear signs of sexism that have been experienced by women in the academic classroom and around their peers within the community. While readers may realize that further movements of feminism and better laws protecting all students from sexual assault and harassment exist today, both implicit and explicit language still exists and is often ignored due to fears of reciprocation or discomfort in reporting these kinds of issues.

Figure 2 – Sexist Quotes and Metaphors

I witnessed [my professor] who is someone very polite, very cultivated, say to me that if he really wished to become a composer (talking about a male student), he must learn to ejaculate. So, I said to myself, shocked, how did he perceive my music? I then understood why he always wanted me to change my music or my sounds.[36]

Ms. Bartley has done a slow but fruitful research, with good final results. However, she has concentrated her compositional efforts in a rather narrow area. Her viewpoints should explore areas outside "feminism" as artistic expression, to justify further graduate work.[37]

Computer operators were described as wizards (as opposed to witches) suggesting a lack of awareness of the ideology grounding such technology.[38]

I brought in a disk that had some interesting vocal sounds on it, that I had sampled, and [one customer] said: "Oh, I've got to rape that disk." Then I said "What did you say?" And I think he even repeated it…I'm not sure what I said after that, but [it was] something like "Do you really have to describe it like that?" And then maybe half an hour or maybe fifteen minutes later, someone else came along, and said the same thing to me. Really it's a certain jargon that they have, and people don't even seem to think about it. It's just a language they use, all the time. [39]

---

[36] McCartney, "Creating Worlds for My Music," 89.
[37] Ibid., 92.
[38] Ibid., 109
[39] Ibid., 49.

Classroom teaching continues to change to fit the more diverse learning needs of students. Many of the women who are now university professors have taken a different approach to teaching music technology to change the social environment of the classroom. To help combat a student who feels uncomfortable asking questions in front of their male colleagues, offering email correspondence, or requesting anonymous written questions can diminish the peer pressure found in these masculine environments. Helen Hall uses an anti-sexist approach that transforms "the gender dynamics in the classroom by shifting attention from demonstrating technique to learning."[40] She responds to the insistent students, who claim they can and know how to do anything, by saying: "Ok, you already know how to do it, then someone else should do it."[41]

Composition and audio technology are still gendered as masculine. As long as these gender and social stereotypes exist, women are forced to "adopt an identity that does not call attention to their femininity but also requires adapting to 'masculine' ways of working in a digital culture that privileges male ways of knowing."[42] In order to create an inclusive classroom environment, one has to not only be aware of these issues, but take steps like that of Helen Hall to counteract them. Studies have shown that incremental theory is a positive step to affirm learning goals and create a learning environment that links working hard to achievement.[43] By teaching with a belief that intelligence is malleable rather than fixed, professors, role models, and cross gender mentorship pairings can help thwart the imposter syndrome many minority students experience, and improve intellectual outcomes in academic areas that face negative gender

---

[40] McCartney, "New Games in the Digital Playground," 164.
[41] Ibid., 164.
[42] Victoria Armstrong, *Technology and the Gendering of Music Education* (Farnham, U.K.: Ashgate, 2011): 31.
[43] Stamper, "Our Bodies, Ourselves, Our Sound Producing Circuits," 38-39.

stereotypes.[44] Additionally, the creation of mentorship programs would provide crucial support, as women regularly cite having like-bodied mentors as an extremely influential part of their education.

A Unique Technological Viewpoint

As mentioned above, women account their experiences and usage of technology differently than their male colleagues. It is worth stating that every composer (regardless of gender, sexual orientation, or skin color) has a unique relationship to composing and how they interact with technology. This being said, there are patterns that emerge through previous case studies. Andra McCartney noted that her consultants (Canadian, female, electroacoustic composers and sound artists) used different images and metaphors compared to the stereotyped male-gendered images described above. Many of their relationships and descriptions are part of a direct response to the male territory of electronic music composition, while others are formed from their attraction to technology and the sounds themselves. Many of McCartney's consultants however, agreed that much of the music composed by their male colleagues gets lost in the circuits or matrixes of the technological tools available to them.[45] Women composers are using technology to create music and advance their artistic process by using technology as a tool to create the sonic environments that appeal to them. They frequently turn to multi-disciplinary projects and take inspiration from improvising and experimenting with the technology as they learn how to navigate its particular language and complexities within a male ecosystem.

---

[44] Ibid., 38-40.
[45] McCartney, "Creating Worlds for My Music," 65-66.

Despite the strong hold of the patriarchy, women have begun to access technology and become influential artists, composers, and music producers, as seen in the previous chapter. Access to technology is essential to allow women to gain the confidence to use technology. The wider access to portable and cheap technology has allowed underrepresented groups to access the equipment and take time to learn the skills to operate the software. The "self-producer" is evidence of this. Women can now create in their own home studios, providing them with an atmosphere that is free from gender stereotyping and being told what is right and wrong. Becoming a self-producer is also an extension of Hannah Bosma's statement that "women in the electroacoustic field do not only combine different music roles, with different gender connotations, but they also often cross established categories of media, disciplines, and genres, combining music, theatre, literature, performance art, visual art, new media, technology, sound documentary, radio art, etc."[46] By combining varying roles defined either feminine or masculine, women are able to enter male-dominated territories without giving up their feminine domain.[47]

Chapter one highlighted the careers of several prominent electroacoustic composers who are often ignored from history books, or even common conversation regarding the development of this genre. These women shared the experience of being othered due to the disproportionate numbers of male electroacoustic music composers, and yet produced unique artist and musical works that helped shape the development of electronic music. A common thread of interdisciplinary work emerges from these experiences. While interdisciplinary work is more normalized today, women's previous work in multiple disciplines strayed from the normal discourse of institutional artistic practice. Since institutions and large granting organizations did

---

[46] Bosma, "Musical Washing Machines," 108.
[47] Ibid., 107.

not have funding models to fit these categories, many women received less funding than men.[48]

These works have typically been viewed as more vulnerable since they do not fit accepted

generic categories and "have suffered oblivion, neglect, or devaluation because of their

differences from the established categories."[49] While this has led to negative consequences for

funding and possibly success, Hinkle-Turner offers an explanation that women's preference for

interdisciplinary works emerges from technology, and in particular MIDI by offering them the

opportunity to become performer-composers.[50] The ability to trigger unique sounds became

enticing enough for women to begin making these sounds for herself instead of performing

works and sounds created by others.[51]

The computer is a tool, an instrument that has near unlimited potential to create sound,

yet is limited by the capacity of processing power and one's own individual ability to work

within the restrains of music software. Pamela Z speaks to the gendered stereotypes of

technological tools. "It seems that people's expectations of the kinds of tool an artist would use

are somewhat separated along gender lines."[52] Z has become a leader and role model for female

and black artists, composers, and performers, and has a history of being used as a token within

new music discourse. She has a unique relationship with technology, reinforcing that the

computer is a tool but that "[she has] a very strong relationship with my tools."[53] Z has

discovered natural tendencies and differences in how women and men approach their art and

---

[48] Ibid., 108.
[49] Ibid., 108.
[50] Elizabeth Hinkle-Turner, *Women Composers and Music Technology in the United States: Crossing the Line,* Reprint ed. (Aldershot: Ashgate, 2007), 122.
[51] Ibid., 122.
[52] Pamela Z, "A Tool is a Tool," in *Women, Art, and Technology*, ed. Judy Malloy (Cambridge, MA: The MIT Press, 2003), 356.
[53] Ibid., 349.

tools different. "Women are often much more comfortable using their voices (and bodies) in untested ways," usually through improvisation and composing, compared to men.[54] It is unfortunate that society "has always socialized women to feel less confident working with mechanical or electronic devices,"[55] as this unique and unabashed approach women have to their "natural" tools (the voice and body) can create unique compositions that could be further enhanced by a unique approach to technological tools and electronic manipulation.

Artist-producers, composer-performers, instrumentalist-composer, artist-entrepreneur are just a few terms that define mutli-disciplinary artists. Women challenge the patriarchal conceptions of femininity by engaging with multiple art forms, and incorporating technology into their work. Paula Wolfe expands on this idea:

> I suggest that the female artist-producer who sings, plays an instrument, composes, engineers *and* produces has taken up the gauntlet of this challenge in even stronger terms through her control over the production of her compositions and through her employment of music technology to exert that creative control.[56]

This disruption of the status quo has led to incredible performances, compositions, and technological developments in the field of music, despite the relatively little attention received from history books and male colleagues. It is due to the gendered language, bias in funding, and difficulties faced with otherness from being the only woman in the studio that has formed the foundations of unique artistic drive and achievement from women, especially in regard to their relationships with music technology.

---

[54] Ibid., 357.
[55] Ibid., 258.
[56] Paula Wolfe, *Women in the Studio*, 96.

Conclusion

Composition and audio technology are two male-dominated domains, making the electroacoustic composition environment very difficult to navigate as someone who does not identify with the male stereotypes of power and control. The traditional methods of teaching and pedagogy do not allow for a variety of learning styles in the classroom, as they are tailored to a very specific learner and embrace traditional stereotypes that "girls are taught to relate, and boys to tinker."[57] To navigate this discipline, women have turned to interdisciplinary works. By frequently using technology as a means to enhance their compositions and work, and not creating music or forming an artistic practice that solely reacts to the available technology. The women highlighted in this document conceptualize and speak about music and the arts in ways that differ from the mainstream. Metaphors of "wilderness, painting, dancing, sustenance, addiction, meetings, circuitry, curses, locks, boxes, and blessings" expand the vocabulary away from the mainstream to demonstrate that the dominant culture is just one of many.[58] This approach leads many women to combine different roles and practices, focusing on interdisciplinary works that feature close collaborations with other artists resulting in a variety of works and approaches to music and politics.[59] Many artists do not identify as feminist, or have different perspectives from being raised in different generations.[60] Women's approaches to music and art have formed and are reinforced by the strategies and achievements of all, demonstrating the importance of acknowledging and celebrating their contributions to the development of electroacoustic music.

---

[57] McCartney, "Creating Worlds for My Music," 81

[58] Ibid., 76-77.

[59] Hannah Bosma, "Gender and Technological Failures in Glitch Music," *Contemporary Music Review* 35, no 1 (2016): 103.

[60] Rodgers, *Pink Noises*, 18.

Issues of gender in the electroacoustic community form from a combination of issues that women and individuals of minority populations face regularly in their classrooms, the performance hall, and their social and professional circles. Gendered language and metaphors are used in the classroom by women and men, role models and mentors, teachers and students, potentially influencing one's approach to music composition and audio technology. It is my hope that dividing these issues into sections might help the reader view the larger issues of gender in music technology. We can and should be more proactive to realize that our language can affect the physical space because of the history and baggage that comes along with it. By breaking down the social gender barrier and working toward a more inclusive teaching model, institutions, teachers, and colleagues can change the social dynamic of electroacoustic composition, helping to bring substantial change towards gender equity.

CHAPTER 3

Finding the Queer in Electroacoustic Music

How do we define queer space in music? Naturally we associate queer music with

LGBTQ+ composers (who are out and public about their sexuality), but we can also look at

queer processes and how they influence all genders and sexual orientations. The verb 'to queer'

means to queer objects, discourses, and disciplines by freeing them from restrictive traditional

binaries. By searching for queer processes, we are able to analyze music in more nuanced ways

to include the audience, the space, the performer, the composer, or any person involved in the

creation and consumption of art. Queerness has emerged by questioning the "understanding of

identity as a stable and fixed category" by considering "sexuality as a product of social

relations."[1] The queer subject resists definition as it works to disrupt and perturb the notion of

the status quo, which itself is always in flux. By analyzing the relationships of sexuality, power,

gender, and our conceptions of normativity, we can begin to address queer aspects of music and

art.

The gendering of technology has traditionally been studied through a heteronormative

lens. Perceiving gender as explicitly male or female to define the expected social and sexual

relations influences the methods in which gender is researched and discussed in technology

studies.[2] Catherina Landström uses the case of the "I-Methodology" in which software designers

---

[1] Andrew Brooks, "Glitch/Failure: Constructing a Queer Politics of Listening," *Leonardo Music Journal* 25 (January 2015): 37.

[2] Catharina Landstöm, "Queering Feminist Technology Studies," *Feminist Theory* 8, no. 1 (April 2007): 10.

use themselves as a model user for their product. This results in a product that favors users who are young men with an interested in technology, because primarily men use and test the design.[3] Gender begins to play a role as women adopt a masculine design style when working with their male cohorts, showing that gender is an "emerging …process in which people and technology are enmeshed."[4] While Landström is speaking about technology studies far more broadly, these ideas can be used in regards with the development and use of audio technology. By queering feminist technology studies, we can look at how gender is altered and used through the use of electronics. "The impetus of queer is to 'disturb all sexual boundaries, and create sexual mayhem, so that any individual may occupy or perform any sexual or gender identity, rather than have a true identity."[5] We see many examples of queer processes in music (most explicitly the alteration of the voice through live electronic processing) by both male and female composers. Through this view, one can attempt to encompass a broader and more thorough understanding of music and electronic processes. The music of Pauline Oliveros, for example, was continually analysed solely through a feminist perspective. Martha Mockus notes that "too many scholarly accounts of Oliveros's work perpetuate sexist and heterosexist assumptions, trivializing her commitment to feminism and her life as a lesbian."[6] Mockus studies Oliveros's music through her life as a lesbian, acknowledging that heteronormative definitions of sex and gender have previously limited our understanding of her music.

---

[3] Ibid., 9.
[4] Ibid., 10.
[5] Ibid., 18.
[6] Martha Mockus, *Oliveros and Lesbian Musicality* (New York: Routledge, 2008), 3.

Alexa Woloshyn argues that queer processes exist in the composition and listening processes of electroacoustic music.[7] This is especially evident through the use of the voice (as both pre-recorded and live sound material) in which few scholars have dedicated their research efforts to. The voice is unique due to its attachment to our body. As listeners, "we imagine our voices to be the way they are because of our bodies' structures, we assume our voices to be among the inevitable consequences of biological sex."[8] The manipulation of the voice through electronic means offers a rich queer space to analyze. This is evident when an audience listens to acousmatic vocal music, since the physical body is completely removed. In this case it is the listener who creates or imagines a body and attaches it to the voice emerging from the speaker. In this way both the listener, the composer, and the performer all have different queer experiences through the creation, performance, and consumption of the same piece. In her discussions of what makes queer music, Woloshyn states:

> The term "queer" became synonymous because its original meaning reflected what society believed about homosexuality: that it was strange, unsettling, disruptive, odd, peculiar and suspicious. Queer Theory relies on Foucault's work on sexuality and power and Derrida's on deconstructionism to destabilise the binary oppositions that underpin our concept of sexuality and gender. I use 'queer' here primarily as a verb (to queer) and an adjective (e.g. queer arousal). The queer process is transgressive, unstable and disruptive, but frees one from restrictive traditional binaries.[9]

This definition of queering music is akin to both Andrew Brooks and Catharina Landström in that it resists definition by always disrupting the status quo.

The origins of glitch music come from the parasite, the unwanted noises that are conceived of as "mistakes" in electronic music. The "sonic micro-objects such as clicks, cuts,

---

[7] Alexa Woloshyn, "Electroacoustic Voices: Sounds Queer, and Why it Matters," *Tempo: A Quarterly Review of Modern Music* 71 (April 2017): 69.
[8] Ibid., 70.
[9] Ibid., 70.

stutters, skips, pops, crackles, splinterings and spikes have spread through digital music culture…forming the basis of a glitch aesthetic."[10] Glitch music exploits these "mistakes" as source material to stray from the norm, creating queer music. While Andrew Brooks makes a compelling case for the "queerness" of glitch music, this changing status quo counteracts his argument. The origins of glitch music are very queer, but closer examination of its changing environment in which glitch techniques have become normalized and domesticated through continual use show us how queer processes can be adopted by the larger, straight male-dominated industry, forcing our definition of queer to evolve. While the source material for glitch music arise from failure, digital processes and technology control these sounds, perfecting them by using regular processes such as sampling, sequencing, equalization, and mastering. This results in glitch music queering the artistic process at the surface level, but regaining control results in these parasitic and queer sounds conforming to hegemonic masculinity.[11] Glitch music serves as an example of a process that is truly queer, that disrupts the norm by taking unwanted sounds and creating a new style of music, but also demonstrates how these processes can be normalized, altering our very definition of queer processes.

Queerness refers to people who identify as a member of the LGBTQ+ community and to the processes that seek to challenge our social constructions of what constitutes male and female defined from a heteronormative perspective. In reality, queer processes abound in the very interactions that women and other minorities face in music and in the electroacoustic studio. As this document highlights, electroacoustic composition has been framed from a male-dominated perspective. Waves of feminisms have sought to make positive change to include equal

[10] Brooks, "Glitch/Failure," 38.
[11] Hannah Bosma, "Gender and Technological Failures in Glitch Music," *Contemporary Music Review* 35, no 1 (2016): 107.

representations of gender in music composition and music technology and, while not finished, evidence of progress is evident. Despite these improvements, society still needs to question whether or not the fundamental concepts of musical material are gendered. Lauren Redhead argues that music composition is a social and political practice, that "the gendered nature of material leads to a preference for women composers whose music can be gendered as male and meets the terms of the discourse of materialism, rather than an outright preference for male over female composers."[12] Essentially, women change their gender by conforming to the male-dominated practices that are found in music (both with and without technology). By altering their gender, whether through learning new language and metaphors, using different musical material, or dressing in neutral colors and non-forming fitting clothing to blend in, they engage in a queer process. It is, therefore, necessary to include queer studies with feminism in order to better understand music and societal behaviors when they do not fit into society's neat definitions of male and female.

Just as the term "queer" resists definition, queer processes and experiences work differently for every member of the LGBTQ+ society. It is important to remember that heterosexual people altering their gender to fit in to a social group dominated by the opposite sex is a queer process, but one that does not negate the unique needs and the discrimination faced by those who have different sexual preferences or gender identities. Gay men, lesbian women, and trans people all face different needs, different types of homophobia and transphobia, therefore developing unique relationships to the world around them and to their artist practices. To

---

[12] Lauren Redhead, "'New Music' as Patriarchal Category," in *Gender, Age, and Musical Creativity*, ed. Catherine Haworth and Lisa Colton (Farnham, UK: Routledge, 2015), 176.

illustrate this point further, this chapter continues with two case studies of queer musicians who have changed the music industry forever, Pauline Oliveros and Wendy Carlos.

Pauline Oliveros

Oliveros's musical career spans the gay liberation and both the second and third waves of women's movements. While she was an outspoken feminist, and a role model to many women composers across North America, her music and activism were very influenced by her life as a lesbian, a concept that is often missed by scholarship that only accounts of Oliveros's life as the token woman in an article or study.[13]

The early biography of Pauline Oliveros features a woman who did not have a feeling of belonging in her community and constantly experienced a sense of outsiderness. Growing up in Houston, the teenager Oliveros knew that there were dangers of being a rebellious figure, risks that did not completely abate even towards the end of her career and life. While Oliveros felt that she had been raised as a "defiant" being by her father, she had "to know exactly how to do it otherwise you can bring physical abuse upon you that you never wanted to have."[14] For Oliveros, this resulted in her leaving Houston, leaving her family, and leaving the "pattern of the mother-daughter-stay-at-home-and-take-care in order to develop who I am" scenario in Houston.[15] She relocated to the musically rich and more gay friendly San Francisco.

It is difficult, if not impossible to separate issues of sexism and issues of homophobia. They overlap frequently, making isolated studies of any one social issue potentially flawed. Oliveros wrote many articles and pointed at issues of feminism well before musicologists began

---

[13] Martha Mockus, *Oliveros and Lesbian Musicality*, 3.
[14] Ibid., 5.
[15] Ibid., 6.

to take the study seriously. While many of the issues Oliveros highlighted during her lifetime are still relevant today, we must never forget or neglect the lesbian aspect of Oliveros's life. Lesbianism helped her decide where to move and influenced the inclusivity that she sought in her music and audiences. Martha Mockus notes that "Oliveros…never 'thinks straight' about music."[16] The composer used the publication of her *Sonic Meditations* to come out to the world, a particularly relevant musical work to do this as it challenges the power dynamic of music composition by including the entire audience in text based musical improvisations/compositions. She created music that is accepting of all forms and abilities of musicians. Her works could not exist without the cooperation and acceptance of others (the audience and the performers), something that all LGBTQ+ persons need as they question their gender and sexuality and find the strength to come out.

Oliveros has been a pioneer in text scores, improvisations, and incorporating inclusivity in her works. Her *Sonic Meditations* were her most popular and influential work that frequently overshadowed her work with music technology. Initially working with analog systems and tape delays, Oliveros created her "Expanded Instrument System" (EIS) which was eventually digitized and used through Max/MSP. The EIS "is a performer controlled delay based network of digital sound processing devices designed to be an improvising environment for acoustic musicians."[17] Towards the end of her life she focused on developing software to enable people with severe mobility limitations and disabilities to create music, the Adaptive Use Musical

---

[16] Ibid., 9.
[17] David Gramper and Pauline Oliveros, "A Performer-Controlled Live Sound-Processing System: New Developments and Implementations of the Expanded Instrument System," *Leonardo Music Journal* 8 (1998): 1.

Instruments (AUMI) software interface.[18] These projects highlight Oliveros's dedication to the

creation of an inclusive music. Her software is used for improvisation such that amateur and

untrained musicians can listen and interact with these devices without formal training. Oliveros

made sure that her AUMI software was available to download online for free. This idea of

inclusivity spills into all of Oliveros's works, especially her *Sonic Meditations*. She incorporates

the audience into her works, creating large improvisations that do not have any specific start or

end times. Improvisation and text scores allowed Oliveros to discover previously hidden musical

abilities. She believe that "There is a range of abilities…Instead of saying 'disability,' we say

'ability.' Everyone has ability."[19]

Oliveros was never afraid to talk about the sensual aspects music. Music is a physical

activity, requiring a physical effort that results in sound pressure differences that move the air to

create the sound waves that ultimately reach our ears. While browsing a psychology text,

Oliveros came across a notion that music penetrates our ears forcibly, a metaphorical

phenomenon that music is phallic.[20] Oliveros's approach to *Deep Listening* disregards this idea

and language. She believed in the finer variations of music, of being able to receive sound, and

having the option (or giving consent) to listening to it. This meditative practice advocates for

mindfulness of sound and motivates personal and social consciousness. It is at the center of her

entire body of work.[21] It is a symbol of her femininity, her lesbianism, and her artistry. *Deep*

---

[18] Jennifer Kelly, *In Her Own Words: Conversations with Composers in the United States* (Chicago: University of Illinois Press, 2013), 153.
[19] Ibid., 156.
[20] Pauline Oliveros and Fred Maus, "A Conversation About Feminism and Music," *Perspectives of New Music* 32, no 2 (Summer 1994): 182.
[21] Rodgers, *Pink Noises*, 27.

Listening allowed Pauline Oliveros to create a community dedicated to the inclusivity of music, and challenged our notions and symbols of control in music and society.

The text scores *Sonic Meditations*, the improvisatorial nature of the Expanded Instrument System, and the tactile abilities of the Adaptive Use Musical Instruments question the notion of the score, the symbols and metaphors of control.[22] Oliveros does not do away with the importance of the score, and the ability they have had for us to learn, create, and share music, rather, she acknowledges that there are more perspectives to be gained by removing music notation. "There's nothing wrong with a score, it's wonderful that we have them, and have that aspect available. But when it becomes the only way, again, it's denying the other possibilities that we have."[23] Oliveros seeks the voices that are silenced in the patriarchal system of music through the examples mentioned above, queering our use of music and providing new experiences and interpretations from those who have limited training or disabilities.

Oliveros was first introduced to music technology with a gift from her mother, a Sears Roebuck wire recorder in 1947 and a Silvertone magnetic tape recorder in 1953.[24] Experimenting and improvising with tape recorders prompted Oliveros's first tape piece in 1960, *Time Perspectives*, a non-notated composition that was created entirely in her apartment as a real-time improvisation. This is especially notable given that live improvisation in the 1950s and 1960s was rare and unusual, making this art form Oliveros's preferred solution to navigating around the creative limits of the written score.[25] In addition to her unique solution of incorporating improvisation to her works, Oliveros was equally creative in turning her apartment into a

---

[22] Oliveros, "A Conversation About Feminism and Music," 184.
[23] Ibid., 184.
[24] Mockus, *Oliveros and Lesbian Musicality*, 17.
[25] Ibid., 19.

personal electronic studio, as there was no access to a proper studio in San Francisco at this time. This means that *Time Perspectives* "emerges from a *lesbian* domestic space c. 1960," a "space of boundless creativity and innovation."[26] It is important to differentiate this space from the academic and commercial electronic studios discussed in chapter one, and even the home studios of male composers. By creating a studio in a welcome and comforting space away from sexism and judgement, Oliveros was free to be completely creative and genuine without having to alter her approach, her gender, or her sexuality in an attempt to fit inside male-centric ideas. Composing and performing music in a queer space is just one way Oliveros sought to be authentic, and the presentation of music in queer spaces is a topic that should continue to be studied as these spaces generally represent and value inclusivity and diversity.

Considering our use of the verb "to queer" we can see Oliveros's music in a new light. Her concept of "Deep Listening" and the abandonment of conventional music making practices make her musical process and compositions queer by challenging the established conventions of Western art music. She herself labelled her *Sonic Meditations* as "deeply political in that they challenge certain premises in the musical establishment, that they open the way for people to participate who aren't musicians."[27] Including the audience as an essential part of her compositions questions the functions of the performer and listener, and the improvisational quality of each work further questions the role of the composer and performer. For Oliveros, queer processes influence all her work, as demonstrated by her meditative approach to music, her ideas that challenge the status quo of listening, and her constant drive for including all people in the musical process by breaking down the barriers of composer, performer, and listener. To

---

[26] Ibid., 20.
[27] Ibid., 43.

approach and perform the music by Pauline Oliveros means one participates in a queer process due to the strong establishment of western musical norms that continue to be embedded into our lives. It is only fitting that we should remember and honor how Oliveros's life and music were heavily influenced by both feminism and lesbianism, especially since it is impossible to tell where one ends and the other begins.

Wendy Carlos

Wendy Carlos is responsible for the popularity of the synthesizer through her album *Switched-On Bach*. It was after this record went platinum that "synthesized sound was finally 'acclaimed as real music.'"[28] The success of Carlos and the album meant increased sales and revenue for Robert Moog and the Moog Company. However, the timing of this album, and more specifically Carlos's popularity aligned with the time she began to undertake her gender affirmation surgery. While she was a pioneer in the synthesizer industry and was thrown into the spotlight due to the popularity of her album, she quickly dropped out of sight. This resulted in a decade of lost time for Carlos. When asked if this affected her music, Carlos stated:

> Absolutely…The fact that I couldn't perform publicly stifled me. I lost a decade as an artist. I was unable to communicate with other musicians. There was no feedback. I would have loved to have gone onstage playing electronic-music concerts, as well as writing for more conventional media, such as the orchestra.[29]

Any artist today can appreciate how devastating having to remain hidden for a decade can be for one's career. But the problems that Carlos faced as one of the first public trans people were far more complicated than being forced into hiding. The public was far less accustomed to the issues

---

[28] Trevor Pinch and Franck Trocco, *Analog Days: The Invention and Impact of the Moog Synthesizer* (Cambridge: Harvard university Press, 2004), 144.

[29] Arthur Bell, "Playboy Interview: Wendy/Walter Carlos," *Playboy* 26, no. 5 (1979).

faced by trans people. The media had a complete disregard for Carlos's preferred pronouns.

Trevor Pinch's book, and the short biography listed in the playboy interview Wendy Carlos

conducted in 1979 refuse to call her by she/her until after her gender affirmation surgery, even

though the composer began living permanently as a woman three and a half years before her

surgery.

Before the release and popularity of *Switched-On Bach,* Carlos already had many issues

and feelings of alienation. She recalls being bullied as a child for preferring the company of girls

and being drawn to art and music over rough house activities.[30] She would not go to school

dances and became feared by her fellow students. This anguish and isolation continued into her

post-secondary studies. Feeling that her body was a mistake, Carlos would go to great lengths to

make sure her appearance did not stand out, and only held platonic relationships. The world of

music, science, and technology allowed Carlos to escape the tortuous social conditions in

college. Carlos says this escape allowed her to polish her techniques by the time she began to

work with Moog and his synthesizer, and credits this as one of the reasons the project was so

successful.[31] In this sense her use of the synthesizer may not have only opened up new

opportunities and new sounds, but to also allowed her access to new identities as a newly

gendered person. Carlos used the synthesizer to "help her transcend her former body and her

former gender identity."[32]

The feelings of alienation Carlos had reflected not only around transphobia, but also with

her choice of musical style. She studied with Ussachevsky at Columbia University and CPEMC,

graduating in 1965 with a masters degree. While she credits Ussachevsky with the

---

[30] Ibid., 82.
[31] Ibid., 83.
[32] Pinch and Trocco, *Analog Days*, 138.

encouragement to start working in a recording studio to support her expenses, she calls this era of avant-garde music "one of the darkest periods for serious music."[33] The serialist and twelve-tone music, chance music, and hyperserialism drifted too far from the strong musical parameters that Carlos desired. She prefers harmony, melody, rhythm, and meter, and did not want to do away with each of these ideas. For someone like Wendy Carlos, who has been a victim to society's prejudice against trans people, she compares the serialization of musical parameters to prejudice. With an "obliviousness and perpetual denial" of melody, harmony, and rhythm, this unconscious denial of music operated like racism and sexism to exclude many types of music.[34] The consistent implications from academia to avoid writing tunes or harmonies had an impact on Carlos. While she did use serial techniques to some degree, her background in math and physics made the twelve tone processes seem trivial in comparison to the formulas and processes she was accustomed to.[35] In the end, Carlos's relationship to this "ugly music" resulted in her seeing an elitist system in the academic world that rejected and silenced the music of others. These were the reasons she left academia and sought her own path, recording *Switched-On Bach* and eventually receiving film music commissions as a freelance composer.

Wendy Carlos was not afraid to provide her perspective of distaste for the "academic" music emerging from electroacoustic centers such as the Columbia-Princeton Electroacoustic Music Center. Those "rigid, un-felt, simulated performance results just drove [her] up the wall."[36] By partnering with Moog and creating her own path in the commercial industry, Carlos

---

[33] Wendy Carlos, "Wendy's World," interview by Frank J. Oteri, *New Music Box*, January 18, 2007, https://nmbx.newmusicusa.org/wendys-world/.
[34] Ibid.
[35] Ibid.
[36] Thom Holmes, *Electronic and Experimental Music* (Oxfordshire, UK: Taylor and Francis Ltd, 2003), 249.

created an album that popularized Moog's technologies and turned the word "synthesizer" into a household word. Before the release of *Switched-On Bach* "People couldn't even pronounce the word 'synthesizer.'"[37] The album was the first classical album to sell over one million copies, receiving a Recording Industry Association of America (RIAA) platinum certification.[38] Many imitators followed Wendy Carlos, but none came to the same success as her. *Switched-On Bach* displayed Carlos's mastery of the synthesizer by using her background as a physicist, mathematician, performer, and composer to customize the Moog synthesizer to create the orchestration needed for the performance of Bach's music.

Carlos's popularity came from the synthesizer and her album *Switched-On Bach*, but her influences do not end with the popular Moog device. Wendy Carlos who was the first artist to create ambient music, with her album *Sonic Seasonings* predating Brian Eno's *Discreet Music* by two years. Her record was the first that was "designed for a new kind of listening paradigm," designed to look away from the microscopic fascination of twentieth century music by creating something that did not require lengthy and concentrated listening.[39]

Finally, Carlos's reinvention of the modern orchestra through digital synthesis and MIDI has been ground-breaking as an educational tool for orchestration. Carlos was aware of the limitations of the technology during the 1980s regarding the techniques of electronic orchestration. It was not possible to sample every single kind of note and timbre that an instrument could create, instead, Carlos was able to use envelopes to create replicas of all the orchestral instruments. Her limitations were her challenges, and Carlos aligned herself with Van

---

[37] Pinch and Trocco, *Analog Days*, 139.
[38] Holmes, *Electronic and Experimental Music*, 251.
[39] Carlos, "Wendy's World."

Gogh's comment; "I'm forever doing what I cannot do in order to learn how to do it."[40] Her passion for the creation of orchestral sounds with synthesizers paved the way for digital sample libraries that use recordings of instruments to recreate timbre, articulation, and tone that range from all dynamic ranges, articulations, and durations.

Wendy Carlos's gender transition, and her Bach recording project were not possible without a support system. Rachel Elkind was Carlos's long-time supporter, producer, and collaborator. The idea to record and produce an album of Bach came from Elkind after hearing a few different arrangements of pieces from Carlos.[41] As Carlos's producer, Elkind persuaded her friend, Ettore Stratta, to submit the record contract application, hoping an application from a male colleague would be more successful due to the "man's world" that was the music business.[42] In addition to the support of being the producer, Elkind played a pivotal role helping Carlos during her gender transformation. She informed Carlos's friends in advance of her gender affirmation surgery, relieving pressure from Carlos to come out to every acquaintance.[43] She would answer the phone and create false stories for Wendy Carlos's disappearance. Speaking of Elkind's influence, Carlos states that "Rachel was the buffer. She was a brick. I don't know how she could keep herself from hating me and throwing rocks after having to answer the phone and lie on my behalf, making up those incredible inventions."[44] Carlos admits that without her gender affirmation surgery, she would have been dead, having contemplated suicide on many occasions.[45] Without a doubt Rachel Elkind was a positive force for Carlos's career and personal

---

40 Ibid.
41 Pinch and Trocco, *Analog Days*,, 139.
42 Ibid., 141.
43 Bell, "Playboy Interview: Wendy/Walter Carlos," 95.
44 Ibid., 95.
45 Ibid., 95.

life, showcasing the important and essential role LGBTQ+ allies have in the personal life and communities of queer people.

Through her continued success as a performer and composer, Wendy Carlos struggled with identity and image as she transitioned through her gender affirmation surgery. Despite being terrified that her image would destroy her career, she prevailed and was commissioned to write the music for *Tron* (1982) and *Beauty and the Beast* (1986). Throughout this incredible career that continues to this day, Carlos never lost sight of her passion for music, which she summarizes:

> Music is something you are very lucky to be able to do. You are lucky to have this time in history when the field is morphing into something new and maybe a few of the little tidbits that you've been able to scratch out of the clay and mud will have lasting effect…You can laugh at those who call you a nerd or laugh at those who say you're obsessive because that's how it's done. There's no way to get around that without doing a poor or cliched job of it. You have to know what you're doing. Feeling and thinking.[46]

Her success, identity, and passion for electronic music has given Carlos the nickname "The Trans Godmother of Electronic Music."[47]

Conclusion

Queer theory can help shape our ideas of feminist study by questioning the heteronormative definitions of male and female by providing different spectrums of gender and sexuality. It is extremely important to recognize that gender and sexuality are independent traits, that a person who transitions to an opposite sex should not be assumed to have a sexual

---

[46] Holmes, *Electronic and Experimental Music,* 382.

[47] Natasha MacDonald-Dupuis, "Meet Wendy Carlos: The Trans Godmother of Electronic Music," *Noisey: Music by Vice,* August 11, 2015, https://www.vice.com/en_us/article/53agdb/meet-wendy-carlos-the-trans-godmother-of-electronic-music.

orientation that changes with their transition. In addition to enhancing feminist studies by studying how gendered processes can change when men or women are a minority in their field, it also holds as its own study in the cases of LGBTQ+ people. The communities and social circles they hold, the queer spaces that they create, and the difficulties of being closeted and coming out all influence their personalities, their artist practices, and the type of judgment and discrimination they have to endure throughout their lives.

The case studies of Pauline Oliveros and Wendy Carlos demonstrate a unique approach to music composition and technology used by composers who identify as members of the LGBTQ+ community. Each person has a truly original story and experience with their coming out process and navigating the various forms of discrimination due to their queerness. In general, the acceptance of the LGBTQ+ community in the wider public has greatly increased. To be queer is to question and disturb the status quo. This very definition makes identifying queer processes difficult, as it is a moving target, constantly questioning and evolving with our definition of the status quo. Wendy Carlos and Pauline Oliveros changed our conception of music, the compositional process, and the use of technology forever. Oliveros was dedicated to the inclusivity of music, and influenced a generation of composers through her work as an educator, philosopher, composer and performer. Carlos's work with Robert Moog and Rebecca Elkind creating *Switched On Bach* made the synthesizer a household name for many musicians who were previously skeptical of its musical applications.

Both of these women were very popular and held a spotlight in the musical world. They both came out in very different, but very public ways. Oliveros used her *Sonic Meditations* to come out as lesbian to the world while Carlos decided to hold an interview with *Playboy Magazine* to come out as transgender. Gay and transgender rights still struggle to achieve

equality today, and affect every member of the LGBTQ+ community whether it is on the surface or intuitively. Both of these women navigated the difficulties of being othered in their communities, but were welcomed through their creative artistic work. The studies of queer processes and gender fluidity in composition and electronic music is quite new, and represents an interesting and promising area of study to help understand the creative process of the queer community.

The interviews of Elainie Lillios, Jess Rowland, and Carolyn Borcherding address some of the issues discussed throughout this document, including how they first became interested in music technology, their approach their unique artistic practices, issues of otherness in a male territory, and their ideas about the role inclusivity and diversity hold in the field of music technology. It is my hope that these recent interviews demonstrate that the field of electroacoustic music is changing, while making evident how much further these changes still need to go.

CHAPTER 4

Case Studies of Women and Queer Composers

In the autumn of 2019, Elainie Lillios (born 1968), Jess Rowland (born 1971), and Carolyn Borcherding (born 1992) were interviewed to discuss their approaches to music composition, their use and relationship to audio technology, and their experiences as working in the electroacoustic world as a woman composer. Each composer brings a unique voice to the issues discussed throughout this document. Elainie Lillios has begun her twentieth year of teaching at Bowling Green State University, where she has been the director of the music technology program. Jess Rowland provides her perspective as a trans woman, freelance artist, and educator at Princeton University. Carolyn Borcherding's life as a current doctoral student presents a younger voice of a woman currently experiencing gender bias in the university classroom. While the scope of this paper does not allow for more than three interviews, the different backgrounds of these composers may serve to highlight and discuss many of the issues women and queer composers face in the male-dominated area of electroacoustic composition, while providing unique insights to their relationships and approaches to music composition and electroacoustic technologies.

Composer Elainie Lillios began her post-secondary education at Northern Illinois University, receiving her bachelor's and master's degrees in music. She earned her doctorate from the University of North Texas, and pursued further studies at the University of Birmingham. Obsessed with sound, timbre, and spatialization, Lillios worked with sound diffusion in many of her tape pieces, becoming an expert in multi-channel audio. She was invited

to the *Rien a Voir* (Montreal) and *l'espace du son* festivals (Brussels) where she was the only American woman to be featured.[1] Her recent accolades have included international and national awards including a Fromm Foundation Commission, a Fulbright Award, First Prize in the Concours Internationale de Bourges, Areon Flutes International Composition Competition, Electroacoustic Piano International Competition, and Medea Electronique "Saxotronics" Competition. She has additionally received grants and commissions from INA/GRM, International Computer Music Association, La Muse en Circuit, ASCAP/SEAMUS, Ohio Arts Council, and National Foundation for the Advancement for the Arts, among others.[2] She serves as the Director of Composition Activities for the SPLICE Institute and holds the rank of Professor of Creative Arts Excellence at Bowling Green State University in Ohio.

Jess Rowland is a sound artist, musician, and composer. Her work revolves around the experience of consumer culture, questioning our relationships between technologies and popular culture.[3] She earned her MFA from the University of California Berkeley where she studied with Adrian Freed, and worked at the Research Lab at the Center for New Music and Audio Technology.[4] There she developed her techniques for embedded sound and flexible speaker arrays, a medium that she continues to work with in the present day. A multi-faceted artist, Jess Rowland's artistic practice emerged largely outside of academic circles to "question and confound specific boundaries between modalities of experience, especially the boundary

---

[1] Elizabeth Hinkle-Turner, *Women Composers and Music Technology in the United States: Crossing the Line* (Aldershot: Ashgate, 2006), 182.

[2] "About" on Elainie Lillios's official website, accessed October 23, 2019, http://elillios.com/about.

[3] Jess Rowland, "Turning Up the Volume: Jess Rowland (Composer, Sound Artist)," by Jessica Griggs, *I Care if You Listen* (July 18, 2018): https://www.icareifyoulisten.com/2018/07/turning-up-the-volume-jess-rowland-composer-sound-artist/.

[4] "Jess Rowland," Princeton University, Lewis Center for the Performing Arts, accessed October 23, 2019, https://arts.princeton.edu/people/profiles/jessrowland/.

between visual art and music."[5] Her work coincides with the DIY movement through her constant inventions and reworkings of technologies, for example, beginning to build paper speakers around 2010. She is currently a 2018-2020 Peter B. Lewis Princeton Arts Fellow at Princeton's Lewis Center for the Arts, teaching a course titled "Sound Art" through the Program in Visual Arts.

A graduate student pursuing a doctorate in music composition at the University of Illinois, composer Carolyn Borcherding's music "explores the potential musical relationships between acoustic instruments and electronics."[6] She earned her Master's degree in Music Composition at Western Michigan University, studying with Christopher Biggs and Lisa Coons, and completed her undergraduate education at Ball State University. Borcherding's music has been featured throughout the United states at the Society for Electroacoustic Music in the United States Annual Conference, the SPLICE Institute and Festival, Electronic Music Midwest, New Music on the Point, and the Experimental Music Studios at 60 Festival.

The interviews were all conducted during the month of October 2019. The candidates were asked a series of questions describing how they first became interested in music and technology, their approaches to music composition, influences of mentors and role models, and their views of inclusivity and diversity in the field of electroacoustic music. Follow-up questions were tailored to each candidate and their respectful answers to the previous questions. The full transcript of each interview can be found in the appendices.

---

[5] Jess Rowland, "Flexible Audio Speakers for Composition and Art Practice," *Leonardo Music Journal* 23, no 1 (December 2013): 33.
[6] "Welcome," on Carolyn Borcherding's website, accessed October 23, 2019, https://www.carolynborcherding.com.

Role Models and Mentors

Role models and mentors can exist in many different forms, influencing many different aspects of one's life. Quite often, in music and more generally in the arts, we see our professors as role models. They help guide artistic decisions, craft our decision making and self-criticism skills, and often aid in the decision making processes that involve furthering one's education or even their career choices. My consultants remarked about the influences their role models had, and the importance for new composers and artists to have support systems and positive people in their lives. As discussed in this document, the issues surrounding role models center around the lack of diversity of prominent women who can lead by example through their work in electroacoustic music. All three composers interviewed cited male role models, and while these men where supportive in every sense, there are limits to how one can empathize with a student or colleague when they themselves have never been faced with a similar gender experiences in their lives.

Influences from our role models, especially when they are professors or teachers, often shape the ways in which we teach. Borcherding's reference to her mentor Chris Biggs at Western Michigan University serves as a good example. Biggs was "the first person to mention that it would be good for me [Borcherding] to be at the mixing board during my fixed media piece," regardless of the intent to mix the sound live because it serves to "[represent] women in electronic music."[7] Borcherding mentions that running the mixing board is important to help define your ownership of your music, as the audience members generally look to the mixing console when acknowledging a composer's work at a concert, but it also serves to provide

---

[7] Carolyn Borcherding, interview with Justin Massey, October 24, 2019.

authority, to "make you look like you know what you are doing,"[8] since women must often work harder to prove their worth, or to become equals and eliminate the "female" tag from "female composer."[9] Borcherding not only benefitted from this advice, but as a younger doctoral student, actively seeks out young women at conferences to provide similar guidance. Looking at her own experiences, she helps her colleagues navigate the social aspects of conferences, coming "alongside these younger women to welcome them and let them know how things work."[10]

Elainie Lillios has synthesized her experiences and her influences from her role models into her teaching method that seeks to "[encourage] students to be explorative and to experiment, but also to value quality and thoughtfulness and to listen to themselves and really listen to their music."[11] Lillios mentions many role models during her interview, and how she was able to actively absorb different music and compositional techniques from every teacher. Lillios believes "everything that happens to us influences us somehow."[12] Her organ teacher helped her realize her passion for music composition and technology, and helped Lillios with her professionalism saying "always play with authority and if you make a mistake, make it with authority. Perhaps when you make that mistake someone will be coughing or their chair will squeak and no one will notice."[13] Her confidence and mastery show in her own teaching as she attempts to have her students "be strong and intentful in whatever it is they are saying."[14]

---

[8] Ibid.
[9] Lauren Redhead, "'New Music' as Patriarchal Category," in *Gender, Age, and Musical Creativity*, ed. Catherine Haworth and Lisa Colton (Farnham, UK: Routledge, 2015), 175.
[10] Ibid., 175.
[11] Elainie Lillios, interview with Justin Massey, October 2, 2019.
[12] Ibid.
[13] Ibid.
[14] Ibid.

Lillios and Borcherding both reference the need to be strong and present themselves confidently in their practice. While Lillios was quoting her first organ teacher, these ideas of women needing to present themselves with authority is important. Borcherding speaks about the intimidation she experienced when presenting works at conferences and her first time going to the mixing board, while also acknowledging that she has to change her behaviour to a more serious tone to avoid her male students saying "does she know what she is talking about? It is technology after all."[15] Mentors and role models who understand the issues of sexism that face women are in a position to guide them through conflicts and issues that may arise, which is one of the many reasons why we must continue to reach for gender parity within electroacoustic music. Issues of sexism continue to plague the industry, and the need for female mentorship becomes crucial to help women deal with these issues and create an environment that is "representative of a non-exclusionary, inclusive space."[16]

In addition to equal gender representation, role models and celebrated composers need to be diverse to provide upcoming generations with access to role models of different races, gender, and sexual representation. Jess Rowland states the importance of having like-minded and like-bodied role models:

> I think it's crucial, I think it's really important. For me my role models were Laurie Anderson and a woman friend of mine who was about ten years older. I always looked up to her as where I wanted to be in ten years because she was always super cool and doing super cool stuff. But I didn't have a trans woman role model or anything like that. I actually think that is really important. I think it is really important that you find that because it is again about not being alone. There are certain experiences and language that only certain people can rock. I felt like that was something missing for me.[17]

---

[15] Borcherding, interview with Massey.
[16] Jess Rowland, interview with Justin Massey, October 17, 2019.
[17] Ibid.

Rowland is currently teaching at Princeton University and notes that "It is a weird kind of dissociation, like two worlds that sometimes just don't talk to each other."[18] She recognizes the value in not becoming isolated in academic circles but instead speaks of "having a healthy perspective on it, especially in terms of your artistic practice, not letting that bubble world become the thing you care about in for work."[19] When asked directly about now being a mentor for others, Rowland said "It's kind of a mind fuck…It is a weird kind of dissociation."[20] Never really knowing that her career would lead her back to academia she now notes that "There are gender queer folk and a lot of women in Princeton who are interested in the kind of stuff I can teach them about. I'm starting to find those students and that is especially exciting for me because I never had that."[21] Ultimately, Rowland sees the need to have role models outside of the patriarchy.

> It means that women and queer folk, and everybody who isn't the patriarchy, that that would be healthy, that would be representative of a non-exclusionary, inclusive space. That day is probably a little bit off in the distance. It would have made a huge difference for me. It is not just about the music or the art, but about living a life.[22]

Lillios, Rowland, and Borcherding all described feelings of isolation or otherness in the field of electroacoustic composition. While the act of composing, practicing, painting, programming often happens in isolation, an artist should never feel isolated due to their gender, sexual orientation, or race. Role models serve as contacts, as proof that one can succeed, and serve to help connect artists with like-minded and like-bodied people to help cope with the

---

[18] Ibid.
[19] Ibid.
[20] Ibid.
[21] Ibid.
[22] Ibid.

isolation and to hopefully avoid the sense of "otherness" that so many people currently experience in such a male-dominated industry.

Being Queer, Queering Music

Queer process abounds in music through our ability to be experimental, to challenge the status quo, and to queer the spaces around us to make the concert experience more inclusive to performers, composers, and audience members. Queerness in music lies at the heart of intersectionality, as stated by Jess Rowland. It is difficult, if not impossible to determine where one form of discrimination begins and ends, as the boundaries are blurred together. In her interview with *I Care if You Listen*, Rowland stated that as a trans women, "it can sometimes be difficult to tell where the transphobia leaves off and the regular old sexism begins."[23] Sexism, transphobia, homophobia, ableism, and racism are "different variations of the same issue. They are all connected."[24]

All three composers mentioned the necessity of role models and mentors, as mentioned in previous chapters. These mentors are part of the fight for inclusivity. Allies are extremely important, as they hold more privilege due to their being part of large, exclusive groups (generally cis-white, straight-male). They are able to encourage positive change through their role as an ally by using their privilege and can help strengthen the voices of minority groups. Many issues, such as the standardization of a non-gendered terminology, would be more easily altered at an institutional level with the support of these allies. Intersectionality is also important

---

[23] Jess Rowland, "Turning Up the Volume: Jess Rowland (Composer, Sound Artist)," by Jessica Griggs, *I Care if You Listen* (July 18, 2018), https://www.icareifyoulisten.com/2018/07/turning-up-the-volume-jess-rowland-composer-sound-artist/.
[24] Rowland, interview with Massey.

to make sure that the "fight for inclusivity can also not be exclusive."[25] Including allies in one's

work means to help them learn more about minority cultures, and become a proponent for

change.

It is difficult to know exactly how one's identity affects their music. Too often, artists

search for surface level representations of their minority status, or simply have a difficult time

corresponding their identity to their music. Jess Rowland spoke about how her community

stimulated her artistic identity.

> [My artistic practice] is definitely defined largely by my community. I think it was really
> essential, actually, for my artistic identity to emerge. The conversations and the community
> of my friends and the people who were also trying to figure out who they were as artists. I
> spent most of my life in San Francisco and I feel like my work has always just been very
> specifically San Francisco or West Cost form of anti-commercialism and very progressive
> take on cultural issues.[26]

While Rowland was quick to identify her community, she also realized through being questioned

by a curator that her art could ultimately be all about her trans identity. She realized that having

"spent the first twenty years of [her] life not speaking," affected her artistic practice.[27] These

questions can become very aggravating, because they are never asked for those who do not have

an identity that strays from a cis-white male. Perhaps it is not being a trans woman that

influences Rowland's art, but her life experiences from being a trans woman that affect it. As she

states, "it shouldn't be like that in a perfect world. But we have experiences."[28]

Obviously, the experiences of being a trans woman are very different than that of a cis-

woman. However, the ability to participate in queer process abound in all people, regardless of

their gender identity or sexual orientation. When asked directly if she changes her behaviour

---

[25] Ibid.
[26] Ibid.
[27] Ibid.
[28] Ibid.

around men, Borcherding mentions how she dresses and how she conducts herself in front of her peers and students. Due to the implicit bias that condition men to gender stereotype women's working roles in society, Borcherding finds it easy to be doubted about her expertise in audio technology. While she enjoys using self-deprecating jokes to humor her students and lighten the atmosphere in her classroom, she refrains from these actions when teaching a group of men. "I don't do that at all because I don't want to give them any room to doubt what I am saying or to question 'Does she know what she is talking about? It is technology after all.'"[29] This is closely related to "the perceived need for women to overperform at work."[30] This notion encourages women to change their attitudes and engage in queer process not to be genuine and unique, but to blend in and not have their abilities questioned or second-guessed by their male colleagues or students. Borcherding sums up this constant need to prove oneself saying "it is really unfortunate that I feel like I have to explain and prove myself."[31]

Inclusivity, Diversity and the Need for Social Change

Defining and differentiating inclusivity, diversity, and equity is necessary in order to have a fruitful discussion over the social issues faced in music technology. Equity is the state of being equal, especially in status rights, and opportunities. A diverse group is one that contains a variety of backgrounds, ethnicities, perspectives, and interests, and no one dominance of a particular trait. Finally, inclusivity refers to the practice and policy of including those people who would otherwise be marginalized. In our discussions of electroacoustic music composition, the field is not diverse, as it is dominated by straight, cis-white males. Its history has not been inclusive

---

[29] Borcherding, interview with Massey.
[30] Lauren Redhead, "'New Music' as Patriarchal Category," 175.
[31] Borcherding, interview with Massey.

through its use of gendered and aggressive language, use of gendered stereotypes in the education system, and the lower wages or lack of promotions and titles awarded to those who fit outside of the white male category, as seen through the work of Alice Shields and Pril Smiley at the CPEMC.

Gender disparities in sound production and recording engineering have been studied to only find that there is no particular reason "as to why men dominate in this industry, other than the traditional factors."[32] This resonates with Jess Rowlands questioning of this topic. "I've definitely had the experience…a lot of these spaces are very white-male, straight situations. Why? Like why?"[33] While the queer community is a minority population, women account for fifty percent of the population, creating a clear disparity that all of my consultants acknowledge. Community is a large factor in gender disparity. When companies, conferences, or any organization speak out about the difficulty of finding women and minority groups to work or present for these groups, the answer that both Rowland and Borcherding provide is to simply put in the effort time find these people. In other words, "good intentions aren't enough either. It has to be an active practice."[34]

Change has occurred in the field of electroacoustic music. Lillios has witnessed the conversations around inclusivity and diversity. While she knew about the women composing electroacoustic music during her studies, "It just wasn't part of [her] conscious thinking."[35] Lillios first heard a lecture from Mary Simoni in 1995 on the topic on inclusivity and issues of equality for women in music composition. She notes that today the electroacoustic community is

---

[32] Paula Wolfe, "A Studio of One's Own: Music Production, Technology and Gender," *Journal on the Art of Record Production*, no 7 (2012).
[33] Rowland, interview with Massey.
[34] Ibid.
[35] Lillios, interview with Massey.

engaging with conversations about inclusivity and diversity, and asking how they can improve. Commenting on the social engagements Lillios noted "I think we have come a long way," but that the community "still [has] a long way to go…there will always be room for us to improve."[36] These conversations have changed rapidly compared to eight years ago, when Borcherding noted that conversations in her undergraduate degrees did not center around gender issues, and her fellow students and professors were not as willing to engage in topics and conversation regarding these social issues. Now organizations such as SCI and SEAMUS are more steadily programming works by women, ensuring there is female representation on every concert.[37]

Being labelled a "female composer" outside of the context of inclusivity and diversity can have derogatory implications. Programming a single work by a female composer to demonstrate diversity can easily become tokenism if the persons or organizations do not continue to promote works by women to achieve gender parity in their music programming. This is evidenced by composers such as Pauline Oliveros and Pamela Z, who have been treated as tokens as the only women referenced in textbooks and album liner notes.[38] "This pattern enacts a double reinforcement of electronic music's male lineage, gendering important stylistic developments as male, and grouping women together as an other to this master narrative.[39] Tokenism results in two consequences:

> Those women composers who have not achieved acceptance by the New Music institution are non-yet-composers (not-yet-subjects), while those women composers who are accepted are presented as pillars of possibility, examples to other women; their difference is valued

---

[36] Ibid.

[37] Borcherding, interview with Massey.

[38] Tara Rodgers, *Pink Noises: Women on Electronic Music and Sound* (Durham NC: Duke University Press, 2010), 11.

[39] Ibid., 12.

so they can stand as symbols of equality, but it is also diminished in order that they become subsumed into the male discourse of material.[40]

These issues lead to a unique issue facing any minority group feelings of otherness. Obviously these incidents differ greatly for each person, but can be grouped through forms of bias and discrimination. In my discussions with Carolyn Borcherding, she mentions two instances of being othered, of being uncomfortable in a situation due to the lack of female colleagues. Her first experience was as an undergrad working as an intern for a recording studio. While she did not go into great detail, the overall negative experience resulted from the work culture saying that "it was just all dudes. It was just a weird environment that I did not like."[41] While this experience ultimately prompted Borcherding away from the music industry degree path and into music composition, this internship and her feelings of otherness occurred at a pivotal time, resulting in a crisis regarding the type of career and education she should be pursuing. The second major experience was being in "an ocean of men" during her first semester of doctoral studies at the University of Illinois, Urbana-Champaign.[42] Without full-time female composition faculty, and only one other female student, Borcherding was not able to properly express herself with a colleague who could empathize.

> All my male colleagues are great and super friendly, but…I really just wanted to talk to other women. It was very isolating and really hard dealing with the change moving from Western Michigan to [Urbana-Champagne] and starting all over not really knowing anyone. And then having no women colleagues. It was very strange.[43]

Comparing her experiences to her undergrad, she did not feel these feeling of isolation, as the more general degree allowed her access to a larger student body, and classes such a women's

---

[40] Redhead, "'New Music' as Patriarchal Category," 176.
[41] Borcherding, interview with Massey.
[42] Ibid.
[43] Ibid.

chorus that provided her with regular contact with female colleagues. But, "As the communities get smaller and smaller from masters to doctorate you feel that isolation more."[44]

Sexism and transphobia share a blurred line, as previously mentioned. While the gay rights movement and marriage equality have certainly improved the quality of life and acceptance for members of the queer community, it has not erased the feelings of isolations or otherness. When asked directly about her experiences of feeling othered in the arts, Rowland states:

> It's a tough one. It's something I feel like I live with every day. It's kind of like breathing. What's your experience with breathing? It feels like a constant noise to me. There is just this background buzz that is just always there. And I can ignore it, I can not pay attention to it which is great, but sometimes I'm reminded it's there. These days I feel like it is better than it used to be, maybe not everywhere, but it is way better. Sometimes it feels like it really doesn't matter. But I always have a second thought about that. Who are my allies? Can I really trust these people? I just don't know because they don't think about me. So I feel like I have to be careful a lot. And not just in terms of getting hurt but how I present myself too. I feel like people ask "so what are trans people like, Jess does this and this and this." Even though that is just me but I feel like I stand in a lot.[45]

Sexism, transphobia, and tokenism are summed up in Rowland's statement. The constant buzz, the need to question the intent of others, and the perpetual need to be careful all stem from these issues that the artistic world, and world at large faces.

It is important to acknowledge that these issues can be compounded to the already isolative experience that is required for composers, and for many people across all the arts. Lillios is honest with potential students who demonstrate an interest in composing. She tells them that "being a composer means that you really have to be ok being by yourself. Because composition…is a very solitary thing."[46] Preparing students for the isolation that is a part of

---

[44] Ibid.
[45] Rowland, interview with Massey.
[46] Lillios, interview with Massey.

composition is important, but it is also equally important to help students interface with other artists, organizations, and audiences that is part of the social aspect of the artistic life. Lillios has created a strong network of successful alumni that reunite at festivals and conferences across the globe. She credits this to her twenty year career in teaching. Creating such a network and family of alumni "is part of the culture that [Lillios has] chosen to value and to try to nurture and grow."[47]

Language and Metaphors, Navigating the Gendered Aspects of Electroacoustic Music

Audio technology is a subset of the larger world of technological innovation and design. While much of the audio equipment that we use was developed for use in war, there is also influence from programming languages and other software designs outside of music and audio design. The gendered language that is used is certainly recognized as an issue for my consultants. Teaching terminology such as male and female ends of XLR cables, and the MIDI master-slave protocol has made Lillios increasingly more self-conscious through her years of teaching. While she can easily change the language, she feels the pressures of the industry that limit her ability to make these adjustments. "I [Lillios] can't start teaching my students something other than the established norm for describing what these things are."[48] Much like how the Python community was able to switch "master-slave" to "workers-helpers," "it's not so much that the world of music technology has to change, it's the meta fields from where music technology has come need to change the way that *they* label and describe. They need to change their vocabulary."[49]

---

[47] Ibid.
[48] Ibid.
[49] Ibid.

Terminology changes are not difficult, and can actually be more beneficial to the field by better describing the its actual function. Male and female cables simply describe the shape of the cable end, not its function. "It is way more informative to say the sending and receiving ends."[50] It was not until Borcherding discerned this terminology that she understood how signal flow is sent through an audio network.[51] The gendered language can not only be vague, but it also sexualizes class content. Sexualized content can lead to feelings of otherness and isolation for women who are in a predominantly male class. Like Lillios, Borcherding also uses the gendered language due to its standardization of language in the audio community. She notes that change has to occur through consideration and effort to change from herself, and to educate others.[52]

Gendered language can also signal one's personal acceptance of members of the LBGTQ+ society, and in particular, those who do not identify with the gender they were assigned with at birth. The previous chapter noted how books and articles refused to acknowledge Wendy Carlos's proper pronouns when she began to transition and live her life as a woman. Jess Rowland experienced similar issues with one her thesis advisors. "He refused to use the right pronouns. I just bit my lip or whatever, I needed him to put his signature on this piece of paper to graduate. So I can't really make a fuss about it, but I definitely never want to talk to him again."[53] It is also concerning that these issues continue to happen, and it especially concerning with the power dynamics between professors and students that are so prominent in academia. Rowland mentions just how damaging language and incorrect pronouns can be, and how obvious the transphobia is in the people who use this language:

---

[50] Borcherding, interview with Massey.
[51] Ibid.
[52] Ibid.
[53] Rowland, interview with Massey.

So like I said I teach at Princeton. There is a trans person in one of my classes. They are in another class as well. A professor in one of their other classes is always saying to them "hey man, hey man, how are you doing?" Like, does he do that to other people, and they said he doesn't. That is so fucked up, it is obviously a transphobia thing, it is so obvious. Maybe that professor has issues with himself I don't know. But it's just a really passive aggressive way of denying someone the experience of themselves. And I think the student handled it really well, definitely better than I would have. I was like, "can I stab him in the eyeball?", and they were like "no you can't do that," and I was like "yeah." So I was really happy that they had the maturity level, and we live now in a world where it is understood that that is not cool, but it did happen and it's happening right now. They are still in that class and that class is happening right now. I don't know, I hope it doesn't affect the student. But yeah, it is still a thing. And it is definitely a thing that happens more to people who aren't in a position of power. That professor has power over that student. And can do that and get away with it because the student's grade depends on that teacher.[54]

Placing gendered and sexualized language in a setting with professor-student power dynamics is concerning, yet this occurs daily in our institutions without much thought because of the traditions and normalization of our usage of language when speaking about technology. For any person who are unsure of their gender or sexuality, or are in the process of coming out, or even struggling with their mental health due to the conflict of their gender or sexuality, the constant reminder and sexualization of technology can easily confine and disengage this population. This is an area that could benefit from more research and study, and hopefully upcoming generations will question the usage of the gendered language used within audio technology, and question how we can better change this language to update our pedagogy and teaching methods to be more inclusive.

Relationship to Music Technology and Approaches to Composition

"The most important element to me is the sound of the sound, which we know as timbre. What does the sound 'sound' like?"[55] Lillios's statement demonstrates her priorities with music

---

[54] Ibid.
[55] Lillios, interview with Massey.

composition and how she works with audio technology to create sound. Technology is a means to an end, a tool to create the sounds that she loves.

> I'm a timbre junkie. I love creating sounds, I love recording sounds, I love listening to sound. And that is the source of everything for me. The why, asking how I include the technology, is not the right question for me. It's why I include the instruments (laughs)! To me, the technology is just a tool. It's a tool to accomplish what I want to accomplish and what I want to accomplish is exploration and experimentation with sound. Some people do that using symphony orchestras. Some people use that using chamber ensembles. I do that using technology! Microphones and DAWs and Max etc. So the "why" is because the technology allows me to explore the things that interest me. And the technology allows me flexibility, and that's the only answer I can give. The "why" is because of the sound.[56]

Lillios embraces music technologies because it allows her to create sound and timbre, something that she has been obsessed with since she began playing the organ at an early age. She relates her work in technology to any instrumentalist, practicing and learning the abilities and limitations of the software available to her. She says, "My abilities are the things that both enable and limit my use of the instrument, also my patience!"[57] Lillios's view of the computer as an instrument helps her define these type of virtuosity. It is not about the programming itself, but the quality of sound and form that defines this artistry. The function of technology for Lillios is how "Sound, Harmony, Melody, Rhythm, Growth" work together to create a piece of music.[58]

Field recordings and electroacoustic processes inspire the works by Carolyn Borcherding. She likes "to make a lot of crazy sounds and see what happens!"[59] Unlike Lillios, Borcherding does not utilize Max/MSP as her primary tool for electroacoustic works. She prefers DAWs, and software such as Cecilia, that allow her to process and manipulate sounds with consistency and relative ease. She avoids using Max/MSP as a principle composition tool because it is easy for

---

[56] Ibid.
[57] Ibid.
[58] Ibid.
[59] Borcherding, interview with Massey.

her to get "bogged down" in the programming language.[60] Speaking with Borcherding, she is interested in technological and audio processes that are effective and produce high quality sounds over trying to learn new languages to only become overwhelmed by them. When composing for an instrument and electronics, this allows her more freedom and time to "try to match timbral gestures with the instrument and the electronics so that there is always a kind of back and forth between the two that ties it all together."[61]

While Borcherding and Lillios share a common use of music technology as a tool, Jess Rowland constantly questions the roles of technology and how it is supposed to work. Her DIY approach is a result of a "love hate relationship with technology" that stems from the "need to create [her] own technology reality."[62] Technology is central to the majority of Rowland's work, and yet it is defined by its unconventional uses. "Technology has always been a big part. And it's not so much that I use technology as I question technology."[63] Smashing laptops and sonifying Google spreadsheets comprise parts of Rowland's work, creating artistic pieces that cross both the visual and musical art realms. Comprising primarily of improvisation, Rowland's first introduction to technology was her boombox. She wanted to make a piece similar to Frank Zappa's *It Can't Happen Here*. By experimenting with her boombox she wrote out the piece then "recorded the vocal part…then I took the tape, rewound it, put it in my brother's stereo, played it, and recorded back onto the boom box the sound of the stereo with me doing the next part."[64] While this ultimately concluded with an arrangement in which the parts first recorded were

---

[60] Ibid.
[61] Ibid.
[62] Rowland, interview with Massey.
[63] Ibid.
[64] Ibid.

barely audible, it demonstrates Rowland's interest in improvisation and her interest in finding creative uses of technology that continue in her work today.

Technology is a tool to be used by musicians to craft and work with sound. While each composer creates unique musical works and engages in different artistic processes, the three candidates I interviewed all see technology as something that is essential to their craft, but yet is also a tool that needs to be constantly questioned and practiced in order to be used artistically. Jess Rowland, Elainie Lillios, and Carolyn Borcherding use music technology as a central tool in the majority of their works, but they still manage to use it pragmatically, and do not use it simply for the novelty of technology. All three speak to a degree about not being "bogged down" by software and instead keeping the artistic practice and act of composition as their priority.

Conclusion

The interviews of Elainie Lillios, Jess Rowland, and Carolyn Borcherding highlight how different artistic practices and methods of integrating technology can still result in certain shared experiences. By looking in-depth at each composer and their unique experiences to being a woman or queer person in the male-dominated discipline of electroacoustic music, I hope to move past large generalizations and seek to highlight how these experiences might shape one's relationship to music technology and approach to music composition.

Each composer contributes a unique perspective on the current reality of electroacoustic music. Through Lillios's twenty years of experience teaching in academia, Rowland's perspective as an artist who works primarily outside of academic circles, and Borcherding's view as a current doctoral student, we can see clear progress that has been made compared to the previous interviews and research conducted by Andra McCartney, Tara Rodgers, and Elizabeth

Hinkle-Turner in the previous chapters. Much of the discussions around inclusivity and diversity seem to have begun within the past ten or twenty years. And the discussions now go beyond just the inclusion of women, but now aim to be more inclusive to the LGBTQ+ community and towards people of color.

The full interview transcripts in the appendices highlight how each composer approaches new compositions, how they work with technology and navigate using gendered language, and how they have worked with role models and continue to serve as positive examples for the music and arts community through the promotion of their work, attendance and interactions at conferences, and through their teaching and pedagogy.

CONCLUSION

Electroacoustic music has a relatively brief history, yet the origins of its ideas and philosophies beginning with the Italian Futurists are now over a century old. This document focuses on the more recent developments of electroacoustic music that emerged after World War II with the development of Electroacoustic Centers in North America, beginning in 1959 with the Columbia Princeton Electroacoustic Music Center (CPEMC). Just over a decade after officially becoming the CPEMC, Joan Peyser wrote an article in the *New York Times* that highlights the scarred history of electronic music and its treatment of women:

> In 1960, the musical action began. A Rockefeller grant brought Davidowsky from Argentina and a Guggenheim grant brought Bulent Arel from Turkey. These five men, ranging in age from 35 to 70, all of whom have composed for traditional instruments, form the hard corps membership of the electronic family group. (Two pretty 26-year-old girls – brunette Alice Shields and blonde Pril Smiley-Delson – Serve as technicians but are composers as well.)[1]

As discussed in chapter one, Pril Smiley and Alice Shields were essential to the functions and academic aspects of the CPEMC, and were never acknowledged through title or pay promotions like their male colleagues. To be added as an offhanded comment as just "pretty girls" is made even worse due to the fact that Joan Peyser was an accomplished musicologist, biographer, music critic, and a woman. It demonstrates the complexities of this topic, and confirms the need for more study regarding how women change their attitudes and gender roles to conform to male-dominated industries.

---

[1] Joan Peyser, "Can the Mark II Sing 'Happy Birthday'?" *New York Times*, May 3, 1970, https://www.nytimes.com/1970/05/03/archives/can-the-mark-ii-sing-happy-birthday-can-the-mark-ii-sing.html.

While the article cited above paints a bleak picture of how society treated these female electroacoustic composers, there are signs of developments and changes. Carolyn Borcherding, Jess Rowland, and Elainie Lillios all speak about the improvements regarding inclusivity and diversity within the arts, and especially within electroacoustic music. Since the establishment of the first electroacoustic centers in North America, history has seen the progression of the Civil Rights Movement (1954-1968), the second and third waves of feminism (1960s and 1990s respectively), and the LGBTQ+ rights movements, leading up to the 1969 Stonewall Rights and the legalization of gay marriage in Canada (2005) and the United States in (2015). Electroacoustic societies such as SEAMUS and SCI now include pronouns on their registration badges, and work to include works by women on every concert at their national conferences. LGBTQ+ acceptance has broaden across the general public, and although there are still feelings of discomfort and distrust, comparing the community of Jess Rowland to that of Wendy Carlos demonstrates a clear shift in understanding and support for members of the LGBTQ+ community.

While these signals are hopeful, both Jess Rowland and Elainie Lillios commented about how far we have to go. "It has to be an active practice" to ensure that gender representation is equal in a community that is still affected by traditional gender stereotypes.[2] Diversity and inclusivity does not stop at music programming. "How can we be more inclusive? Not just in the people who are creating the music, but how we are more diverse and inclusive with our audiences, with the people who come into contact with our music, in the venues where we perform?"[3] Representation is extraordinarily important in the musical community. History

---

[2] Jess Rowland, interview with Justin Massey, October 17, 2019.
[3] Elainie Lillios, interview with Justin Massey, October 2, 2019.

courses, faculty and student bodies, and general music programming should reflect a diversity of people. The electroacoustic music community and technology fields at large need to realize the importance of having access to like-minded and like-bodied role models. These mentors serve as a sign of permission for those (in particular minority and oppressed cultures) to be successful in a given field. Ultimately, these professions need to be representative of a non-exclusionary, inclusive space for all people to be successful.

Technology changes at such rapid paces that it can be difficult for research to keep pace. Almost every interview featuring an electroacoustic music composer discusses their introduction to audio technology through analog machines. Scholars, professors, and researchers need to recognize that current students will not have had access to this hardware, that they work in the digital realm primarily with software. The very methods in which the new generations are being introduced to music technology is changing. While her brother did have a cassette recorder, Borcherding began her music technology studies working with digital processes, mixing boards, and DAWs on computers. Access to the internet is also changing the way we learn about technology. "You can learn this stuff at home. The technology is no longer an arbitrary or impediment. We have tools to allow most anyone to put together 'brace new world' forms of artistic creativeness."[4] Gendered and sexist metaphors are slow to change compared to the fast evolution of technology. The very nature of pedagogy and language needs to adapt to the changing standards of inclusivity, diversity, and equality that are present in our society today.

Researching the prominent women and queer composers in the history of electronic music and discussing issues of feminism and queer theory can demonstrate that the fundamental

---

[4] Wendy Carlos, "Wendy's World," interview by Frank J. Oteri, *New Music Box*, January 18, 2007, https://nmbx.newmusicusa.org/wendys-world/.

relationship women and queer composers have with music technology differs from that of their straight, cis-male colleagues. This relationship is formed from their experiences, from being othered amongst their fellow students and colleagues, and from facing a constant barrage of aggressive and sexual language to describe the functions of operations, tools, and software in music technology.

While limited in scope, this document encourages discussion and research into the experiences held by minority groups in the field of music technology. While issues of race, ableism, and ageism have not been addressed, it is important to recognize that "It really is all part of one piece. It's intersectionality…It is all connected, racism, sexism, transphobia. It's different variations of the same issue."[5] While feminism and queer theory were discussed in different chapters, it is the combination of these two theories that yield truly interesting results. More research is needed into how composers, regardless of their sexual orientations or gender identity, alter their gender to fit into the male-dominated realm of music technology. Gender roles and stereotypes are generally defined by heteronormative definitions of male and female. By changing one's attitude and persona when teaching and being forced to use aggressive and sexist language results in an artist altering themselves, and creating potentially negative experiences that can alter their artistic practices unknowingly.

An entire generation witnessed male captains controlling the female voice of the computer in *Star Trek*, institutionalizing gender stereotypes of male-control. Today, society communicates regularity with an ever improving version of Apple's Siri, a robotic voice that is continually updating to sound more natural and more human. The default voice on Apple devices is female, and from personal experience of changing Siri's voice to male, I am constantly

---

[5] Rowland, interview with Justin Massey.

questioned by my peers, mentors, and family as to *why* I would have changed Siri's voice. So while we now have the ability to alter this power dynamic, society demonstrates its conservativism to change. Implicit gender biases continue to manifest themselves in unique ways. Will we ever have a gender-neutral Siri? Humanity's instinct to assign gender seems to increase with disembodied voices, and as our devices adapt and artificial intelligence increases, society will need to address issues of gender representation in technology.

To change the representation of composers in electroacoustic music, one must be able to understand in more detail the challenges that face women and minority groups. This document highlights some of these struggles, while also showing how women and queer composers have been able to overcome these issues and become successful artists that are able to serve as role models and mentors for the next generation. By understanding the hardship that have faced women and queer composers, one can enact thoughtful and positive change to help make the genre of electroacoustic music more diverse and inclusive for all.

Selected List of Female Electroacoustic Music Composers[1]

Name	Country	URL
Abbasi, Anahita	USA	anahitaabbasi.com
Aberdam, Eliane	USA	www.composer.aberdam.com
Ahn, Jean	USA / Korea	jeanahn.com
Anderson, Laurie	USA	www.laurieanderson.com
Anderson, Ruth	USA	
Antas, Linda	USA	www.lindaantas.com
Aresty, Abby	USA	abbyaresty.comabout
Atkinson, Lisa	USA	www.atkinsonlisa-composer.com
Bacon, Alexis	USA	www.alexisbacon.com
Baker, Elizabeth A.	USA	elizabethabaker.com
Bartley, Wende	Canada	soundcloud.comwendalyn/tracks
Beecroft, Norma	Canada	www.musiccentre.canode/37277/biography
Beglarian, Eve	USA	evbvd.com
Bellavance, Ginette	Canada	www.musiccentre.canode/37882/biography
Bertrand, Ginette	Canada	www.musiccentre.cafr/node/37498/biography
Bertucci, Lea	USA	www.brokendiorama.com
Besharse, Kari	USA	karibesharse.net
Biggs, Betsey	USA	www.betseybiggs.org
Blasco, Merche	USA	half-half.es
Bleau, Myriam	Canada	www.myriambleau.com
Blectum, Blevin	USA	www.blevinblectum.com
Block, Olivia	USA	www.oliviablock.net
Bodle, Carrie	USA	www.carriebodle.com
Bolton, Rose	Canada	www.rosebolton.com
Bordreuil, Leila	USA	www.leilabordreuil.comabout.html
Braginsky, Natalie	USA	natalie.computer
Brazelton, Kitty	USA	www.kitbraz.comworksG.html
Brosin, Annette	Canada	www.annettebrosin.com
Brown, Becky	USA	becky-brown.org
Brown, Courtney	USA	www.courtney-brown.net
Brown, Eliza	USA	www.elizabrown.net
Bukvich, Svjetlana	USA	svjetlanamusic.com
Burgon, Shelley	USA	shelleyburgon.comcvbio
Butler, Jennifer	Canada	jenniferbutlercomposer.ca
Byrne, Madelyn	USA	www.madelynbyrne.com
Campbell, Raylene	Canada	raylenecampbell.com
Carlos, Wendy	USA	www.wendycarlos.com

---

[1] Information drawn from Composer Diversity Database assembled by the Institute for Composer Diversity, www.composerdiversity.com

Chavez, Maria	USA	mariachavez.org
Cheah, Victoria	USA	victoriacheah.com
Chen, Christine Elise	USA	christineelisechen.comlisten
Chen, Lily	USA / Taiwan	chenlily.com
Clement, Sheree	USA	shereeclement.com
Clyne, Anna	USA	www.annaclyne.com
Cocolas, Madeleine	USA	www.madeleinecocolas.com
Cole, Crys	Canada	cryscole.com
Coons, Lisa Renée	USA	www.lisarcoons.com
Coulombe, Renée T.	USA	www.reneetcoulombe.com
Crispo, Martine	Canada	www.macaronimusic.com
Cunningham, Flannery	USA	flannerycunningham.com
Czernowin, Chaya	USA	chayaczernowin.com
Davachi, Sarah	Canada	www.sarahdavachi.com
Davis, Sydney	USA	www.sydneyrdavis.com
De Wys, Margaret	USA	bombmagazine.org/article/3404/margaret-de-wys
Deitz, Marissa	USA	marissadeitz.com
Devorah, Rachel	USA	racheldevorah.studio
Di Castri, Zosha	USA	www.zoshadicastri.com
Diels, Natacha	USA	natachadiels.com
Dobkin, Dani	USA	danidobkin.com
Du Yun	USA / China	www.channelduyun.com
Dunaway, Judy	USA	www.judydunaway.com
Dusman, Linda	USA	lindadusman.com
Eaton, Kaley	USA	www.kaleylaneeaton.com
Eichelberger-Ivey, Jean	USA	en.wikipedia.org/wiki/Jean_Eichelberger_Ivey
Eldar, Sivan	USA	www.sivaneldar.com
Elias, Sivan Cohen	USA	www.sivancohenelias.com
Eotvos, Melody	USA	www.melodyeotvos.com
Epstein, Nomi	USA	www.nomiepstein.com
Escalante-Chernova, Irina	USA	www.composers21.comcompdocs/escalant.htm
Farbood, Morwaread Mary	USA	www.nyu.edu/projects/farbood/
Fishman, Ellen	USA	www.efjcomposer.com
Flanigan, Lesley	USA	lesleyflanigan.com
Fristensky, Louise	USA	www.louisefristensky.com
Friz, Anna	USA	nicelittlestatic.comabout/
Frykberg, Susan	Canada	www.sounz.org.nz/contributors/1043
Fullman, Ellen	USA	www.ellenfullman.com
Fung, Vivian	USA	vivianfung.ca
Fure, Ashley	USA	www.ashleyfure.com
Gardner, Alexandra	USA	www.alexandragardner.net
Gately, Katie	USA	www.katiegately.com

Gimon, Katerina	Canada	www.katerinagimon.com
Goeringer, Lyn	USA	www.lyngoeringer.comportfolio/
Gosfield, Annie	USA	www.anniegosfield.com
Grigsby, Beverly	USA	www.beverlygrigsby.org/home.shtml
Harris, Yolande	USA	yolandeharris.net
Hays, Sorrel	USA	sorrelhays.net
He, Kay	USA	www.kayhecomposer.com
Helmuth, Mara (Margaret)	USA	www.marahelmuth.com
Henry, Jane	USA	www.janehenry.com
Heredia, Carolina	USA	www.carolinaheredia.com
Herndon, Julie	USA	Www.julieherndonmusic.com
Hindman, Heather	Canada	www.heatherhindman.com
Hinkle-Turner, Elisabeth	USA	
Hoffman, Elizabeth	USA	wp.nyu.edu/elizabeth_hoffman/
Ibarra, Susie	USA	www.susieibarra.comsusieibarra/
Ittoop, Elisheba	USA	www.elishebaittoop.com
Jackson, Yvette	USA	www.yvettejackson.com
Jean, Monique	Canada	www.electrocd.comfr/artiste/jean_mo/Monique_Jean
Joachim, Nathalie	USA	nathaliejoachim.comabout/
Jobin, France	Canada	www.francejobin.com
Jones, Bonnie	USA	bonnie-jones.com
Jones, Jennie	USA	www.jenniecjones.com
Kelly, Elizabeth Joan	USA	www.zoekeating.com
Kennedy, Kathy	Canada	kathykennedy.ca
Kim, Christine Sun	USA	christinesunkim.com
Kimura, Mari	USA	www.marikimura.com
Klein, Judy	USA	en.wikipedia.org/wiki/Judy_Klein
Knox, Liz	USA	www.elizabethaknox.com
Kui Dong	USA	www.dartmouth.edu/~kui/index.html
Kyong Mee Choi	USA	www.kyongmeechoi.com
La Barbara, Joan	USA	www.joanlabarbara.comindex.html
Lanning, Juniana	USA	amplifyingglass.wixsite.comjuniana
Leach, Mary Jane	USA	mjleach.com
Lien, Christen	USA	www.christenlien.com
Lillios, Elainie	USA	elillios.com
Lizée, Nicole	Canada	www.nicolelizee.com
Lockwood, Annea	USA	
Logan, Jennifer	USA	www.jenniferlogan.com
Loveless, Melody	USA	melody-loveless.squarespace.com
Machado, Thessia	USA	thessiamachado.com
Macklay, Sky	USA	www.skymacklay.com
Magnus, Cristyn	USA	cmagnus.com

Mann, Frankie	USA	www.lovely.combios/mann.html
Matthusen, Paula	USA	www.paulamatthusen.com
Mazzoli, Missy	USA	www.missymazzoli.com
Mccartney, Andra	USA	www.centreforsensorystudies.org/member/andra-mccartney/
Mermelstein, Julia	Canada	Juliamermelstein.com
Miksch, Bonnie	USA	www.pdx.edu/profile/bonnie-miksch
Miller, Joan	USA	
Miller, Julia	USA	juliamiller.org/?page_id=15
Monk, Meredith	USA	www.meredithmonk.org
Mooke, Martha	USA	www.MarthaMooke.com
Muñoz, Amor	USA	amormunoz.netabout/
Naphtali, Dafna	USA	dafna.info
Navarro, Fernanda	USA	www.fernandanavarro.net
Negron, Angelica	USA	www.angelicanegron.com
Noble, Margaret	USA	www.margaretnoble.net
Norderval, Kristin	USA	kristinnorderval.org
Ogden, Allison	USA	louisville.edu/music/faculty-staff/Faculty/allison-ogden
Oliveros, Pauline	USA	
Oram, Celeste	USA	celesteoram.com
Parkins, Andrea	USA	www.goddard.edu/people/andrea-parkins/
Parkins, Zeena	USA	www.zeenaparkins.com
Payne, Maggi	USA	maggipayne.com
Peacocke, Gemma	USA	www.gemmapeacocke.com
Prestini, Paola	USA	paolaprestini.com
Reid, Ellen	USA	ellenreidmusic.com
Reid, Leah	USA	www.leahreidmusic.com
Reid, Wendy	USA	www.treepieces.netindex/
Roberts, Megan	USA	www.roberts-ghirardo.net
Rodgers, Tara	USA	www.analogtara.netwp/
Rosenbaum, Keren	USA	www.kerenrosenbaum.com
Rosenberger, Katharina	USA	www.krosenberger.ch/
Rosenfeld, Marina	USA	www.marinarosenfeld.com
Rowland, Jess	USA	
Rykova, Elena	USA	www.elenarykova.rocks
Rylan, Jessica	USA	www.irfp.net
Sauvage, Tomoko	USA	o-o-o-o.org/
Scaletti, Carla	USA	carlascaletti.com
Schedel, Margaret	USA	schedel.net
Schroeder, Sabrina	Canada	sabrinaschroeder.com
Schuman, Joan	USA	www.joanschuman.com
Selin, Hannah	USA	hannahselin.net
Shatin, Judith	USA	www.judithshatin.com
Sheehan, Kelley	USA	www.kelleysheehan.commusic-instrumentation

Shields, Alice	USA	www.aliceshields.com
Shirazi, Aida	USA	aidashirazi.com
Simms, Bekah	Canada	www.bekahsimms.com
Smiley, Pril	USA	en.wikipedia.org/wiki/Pril_Smiley
Sonami, Laetitia	USA	sonami.netbio
Southam, Ann	Canada	en.wikipedia.org/wiki/Ann_Southam
Spiegel, Laurie	USA	lauriespiegel.net
Srinivasan, Asha	USA	www.twocomposers.org/asha/about.php
Stebbins, Heather	USA	Www.heatherstebbins.com
Sung, Stella	USA	www.stellasung.com
Suzuki, Kotoka	USA	www.kotokasuzuki.com
Tallon, Tina	USA	tinatallon.com
Tamirisa, Asha	USA	ashatamirisa.net
Temple, Alex	USA	www.alextemplemusic.com
Thomasian, Jasmine	USA	jmthomasian.wixsite.comjasminetcomposer
Thome, Diane	USA	www.dianethome.com
Thorpe, Suzanne	USA	www.suzannethorpe.combio
Touch, Caustic	USA	caustictouch.com
Trębacz, Ewa	USA	ewatrebacz.com
Triana, Alba	USA	www.albatriana.comindex.html
Turcotte, Roxanne	Canada	roxanneturcotte.com
Ueda, Rita	Canada	www.ritaueda.com
Ugay, Liliya	USA	www.liliyaugay.com
Volness, Kirsten	USA	www.kirstenvolness.com
Wagner, Kaitlyn	USA	www.kaitlynwagnermusic.com
Wang Lu	USA	wanglucomposer.com
Wang, Fay	USA	www.faykueenmusic.com
Wang, Jen	USA	jenwang.com
Warren, Kristina	USA	kmwarren.org
Washington, Shelley	USA	shelleywashington.com
Weaver, Sarah	USA	www.sarahweaver.org
Weber, Barbara	USA	www.barbarajweber.com
Wentworth, Sara	USA	sarawentworth.com
Westerkamp, Hildegard	Canada	www.sfu.ca~westerka/compositions.html
White, Frances	USA	rosewhitemusic.comabout-frances-white
Wolfe, Kristina	USA / UK	Kristinawolfemusic.com
Wrangell (Von), Catalina	USA	catalinavonwrangell.com
Yip, Viola	USA	soundcloud.comviolayip
Yoon, Bora	USA	borayoon.com
Young, Gayle	Canada	www.gayleyoung.net
Young, Katherine	USA	katherineyoung.info
Young, Nina	USA	www.ninacyoung.com
Younge, Bethany	USA	www.bethanyyounge.com
Z, Pamela	USA	www.pamelaz.com

APPENDIX B

Electroacoustic Music Centers (1955-1986)[1]

Name	Established	Location	Affiliated Institutions
Louis and Bebe Barron Studio	1948	New York	
Westdeutscher Rundfunk - West German Radio	1951	Germany	
Groupe de Recherches de Musique Concre`te (GRMC)	1951	Paris, France	
Elmus Lab	195	Ontario, Canada	
NHK Studio	195	Japan	
Columbia University Electronic Music Center	1955	New York	Columbia University
Centre for Electronic Music	1956	Netherlands	Philips Research Laboratories
Bell Telephone Laboratories	1957	Murray Hill, New Jersey	
The Cooperative Studio for Electronic Music	1958	Ann Arbor, Michigan	
BBC Radiophonic Workshop	1958	London	
Columbia-Princeton Electronic Music Center	1959	New York	Columbia University, Princeton University
University of Toronto Electronic Music Studio	1959	Ontario, Canada	University of Toronto
University of Illinois Experimental Music Studio	1959	Urbana, Illinois	University of Illinois

---

[1] Roger Dean, ed., *The Oxford Handbook of Computer Music* (Oxford and New York: Oxford University Press, 2009).

Estudio de Fonologĩa Musical	1959	Buenos Aires, Argentina	University of Buenos Aires
Studio Für Elektronishce Musik	1959	University of Buenos Aires	
Israel Center for Electronic Music	1960	Israel	
The San Francsico Tape Music Center	1961	San Francisco, California	
Brandeis University Electronic Music Studio	1961	Waltham, Massachusetts	Brandeis University
Electronic Music Studio	1964	Trumansburg, New York	
McGill University Electronic Music Studio (EMS)	1964	Montreal, Canada	McGill University
Stockholm Elektron Musik Studion (EMS)	1964	Stockholm, Sweden	
Center for Electronic and Computer Music (CECM)	1966	Paris, France	
Victoria University Electronic Music Studio	1966	Wellington	Victoria University
Estudio de Fonologĩa Musical	1966	Venezuela	Instituto Nacional de Cultura y Bellas Artes (INCIBA)
Electronic Music Studio	1967	London, England	Royal College of Music
Electronic Music Studio	1967	Australia	University of Adelaide
Institut de Recherche et Coordination Acoustique/ Musique (IRCAM)	1970	Paris, France	
Electronic Music Lab	1970	Mexico	Mexico National Conservatory of Music
"Underground Laboratory" Electronic Music Studio	1970	New York	Princeton University

Electronic Music Studio	1971	Jerusalem	Academy of Music and Dance in Jerusalem
Electronic Music Studio	1971	South Africa	University of Natal
Electronic Music Studio	1974	Tel-Aviv	Rubin Academy of Music at Tel-Aviv University
Center for Computer Research in Music and Acoustics (CCRMA)	1975	Stanford, California	Stanford University
Electronic Music and Video Studios	1975	Melbourne, Australia	La Trobe University
Computer Audio Research Lab	1979	San Diego, California	University of California at San Diego
Electronic Music Studio	1981	Seoul, Korea	Seoul National University
Estúdio da Glória	1981	Janeiro, Brazil	
MIT Electronic Music Studios (EMS)	1985	Cambridge, Massachusetts	MIT
MIT Media Lab	1985	Cambridge, Massachusetts	MIT
Computer and Electronic Music Studio	1986	Beijing, China	

EL: Elainie Lillios

JM: Justin Massey

JM: How did you first become interested in music and audio technology, whether they were at the same or different times?

EL: I think there was an evolution for me to music technology. I grew up in the Chicago suburbs and there was girl down the street who took organ lessons. This was back in the 70s when organ was the thing, and I heard her playing the organ and of course it was one of those two manual organs with the curved full foot pedal and it had all the buttons that could make the rhythms and all the cool sounds. And I said to my parents "I want to play the organ!" [laughs] So that was the beginning of it for me. I started taking organ lessons and I am a classically trained organist. I think it's through the organ that I came to music technology. It's definitely through the organ that I came to composition. I was nine, I think, and I went to my organ lesson one day and my organ teacher sat me down and said "Ok Elainie today we are going to learn a little bit about composing." I was nine so I said "Sure!" [laughs] And so my organ teacher had composed what she later taught me was an antecedent phrase and I had to compose a consequent phrase. And thus began my foray into composition. I started composing organ works of course, and I learned music theory.

The music technology part I think came from studying organ. Because when you play organ, it has stops. And depending on the type of organ there are levers that you pull or push, or there are tabs that you press down or push up. Or if you are playing a pipe organ they have the stops that are the pistons that you pull out or push. And those levers, or tabs, or pistons change the sound of the instrument. I think that is how I ended up in music technology. I just started being really interested in sound because I could change the sound of my instrument. If I wanted to play some big bombastic thing I could pull out all the stops, which we know as a turn of phrase. But I could pull out all the stops, literally, and play the pedals and both hands and make this big huge sound. At the same time then, as I was growing older in the 80s, synthesizers became all the rage. Fast forward to the 80s and we end up with synthesizers. What is the relative of the organ? -- the synthesizer. So I made the transition from organ to synthesizer, and then synthesizer down into the depths of analog tape manipulation and analog synthesis and etc etc, programming and on and on. So it's because of the organ! I mean long and short of it from playing the organ.

JM: So you still have an obsession with timbre from the organ?

EL: Yes! And that gets into how and why I include technology in my work. There are reasons, and I think it does all stem back to this idea of playing the organ.

JM: Working with music composition and electronics, which I am sure has changed through your career, what is your approach to electroacoustic compositions.

EL: I could make a macro statement about my work with technology. The most important element to me is the sound of the sound, which we know as timbre. What does the sound "sound" like? And when I am composing a piece, the tools to me are not as important as the end result. So whether I am composing a fixed media work, using a DAW, or doing programming,

whether I'm composing an interactive piece with instruments using Max, whether it's a collaborative installation or a collaborative video piece with someone else, I'm always thinking first and foremost about the sound. And I think that having been an organist I've become a sound junkie. I'm a timbre junkie. I love creating sounds, I love recording sounds, I love listening to sound. And that is the source of everything for me. The why, asking how I include the technology, is not the right question for me. It's why I include the instruments [laughs]! To me, the technology is just a tool. It's a tool to accomplish what I want to accomplish and what I want to accomplish is exploration and experimentation with sound. Some people do that using symphony orchestras. Some people use that using chamber ensembles. I do that using technology! Microphones and DAWs and Max etc. So the "why" is because the technology allows me to explore the things that interest me. And the technology allows me flexibility, and that's the only answer I can give. The "why" is because of the sound.

And the "how "question is similar to asking "how do you play the saxophone?" or "how do you play the organ?" Well, I learned how to do it and I do it. And I practice at it. It's a tool or an instrument. The computer is an instrument, like the saxophone or the organ in that you learn what it is capable of doing. You learn how to use it, and you gain proficiency and virtuosity with it. Through your own dedication to it. My abilities are the things that both enable and limit my use of the instrument, also my patience [laughs]! So I no longer sit down and program, frankly because I just don't have the patience, I have too many projects to do. But truly it's the computer as an instrument. Like any other instrument you need to figure out what it's capable of doing. You need to practice, you need to learn how it functions, learn how to manipulate it and continue to try to use it to express whatever you want to express musically, just as instrumentalists do.

JM: There is a difference between writing for an instrumentalist and a computer. When you write for an instrumentalist you give the expert a tool, music that they have to interpret, but often the instrumentalist might not be proficient at using the technology. Do you think this changes how you write for an instrument vs the electronics?

EL: I can say that when I compose for an instrumentalist with technology the process is different than when I compose a fixed media piece that just plays back on loudspeakers. When I compose for instruments somehow I still need some inspiration that goes beyond just the instrument, and I've been using poetry, various poets including my long-time collaborator Wally Swist. I've also sought inspiration from other things, but I somehow need that extra-musical guidance, although lately I've gone away from that a little bit. But when I compose electroacoustic, just fixed-media pieces to be played back on loudspeakers, it's only about the sound. I don't think "now I'm going to write a piece about the clouds." I record sounds that are interesting to me, I process them in various ways, and I put them together. But when I compose for a human, an instrumentalist, I somehow still need something to give me ideas.

JM: Knowing your music, and having played a little bit of it, you also engage in a close collaborative process with your instrumentalist.

EL: I do when performers invite or commission me to write a piece for them, that includes technology or not. I do like to collaborate with performers because I feel like if they want me to write a piece for them, they want a piece that is for them, but they also somehow want me. So if you are the commissioner and I am the composer, my preference is that we come together as collaborators. I assume if you ask me to write a piece for you, it's because you have perhaps heard my music and you like it, the "Elainie Lillios-ness" of the music, the thing that makes it my music. But there are also things that *you* like as a performer. There are pieces or composers

or types of music that you gravitate towards naturally, and I want to acknowledge and embrace that in the process so that somehow you get a piece that you feel you are invested in, that you have had some creative input into, some contribution into, some of yourself is part of the process and at the same time that some of myself is part of the process. So I do like to work with performers and I like to work closely with them, when able. It isn't always possible but I try.

JM: It sounds similar to how you become proficient at the sound of the computer. The easiest way to explore the sounds of an instrument is to have the instrumentalist help you.

EL: Absolutely, you are proficient at what you do. And so, you as a performer are in a position to say, "I can do this, super super fast. I can't do this as fast but I can do it with this squeaky thing or I can play it with this multiphonic and blow it into this fluttertongue or I can…" You have an intimate knowledge of that instrument from the perspectives I need which are timbre and virtuosity. What kind of sounds can you make on that instrument? Not just the notes that you can play, not just the range of the instrument, the tessitura. But the sounds that you can make and to me that is the collaborative process at its best. It's the explorations, the "What if we do this?" "Well I can't do that but what if we did that other thing" and I'll be like "Oh yeah! Now stand on one foot while doing it!" [laughs]

JM: I would like to hear more about your influences of poetry and how you got into the collaborations of other art forms as inspiration.

EL: I abandoned acoustic writing for a period of time because I felt I no longer had anything to say that even came close to the music of composers who I admired. So I came across a roadblock, and it was bigger than a roadblock it was a huge wall. And I was unable to scale that wall at that time. So immersing myself into electroacoustic composition, fixed media composition, was a way I could still express myself creatively and feel I was being creatively

productive. And at the same time growing as a composer while avoiding that big wall. And I found that I loved composing electroacoustic music. I really didn't enjoy writing for instruments after a point. So I abandoned instrumental writing. Then I got a job at Bowling Green State University and I have three amazing composition colleagues who are all fantastic at instrumental writing. In 2007, my colleagues John Sampen and Marilyn Shrude approached the faculty composers and said "We would like all of you to write little postcard pieces for saxophone and piano, two to three minutes." I had not written a lick of instrumental music in a long time. I thought to myself "Well I'm not going to be left out of this!" [laughs] I actually have Marilyn Shrude and John Sampen to thank for getting me back into the world of instrumental writing. Then the saxophonist Steve Duke commissioned me to write what became my first live electronics piece, *veiled resonance*, the piece that you [speaking about Justin] have played.

So, now that I had immersed myself so thoroughly in electroacoustic composition, in timbre focussed composition, I found myself able to return to instrumental writing from a different perspective. Rather than thinking about "oh crap what note is going to go on the page, what is the first note, is it going to be the right note? Is it going to be the wrong note? What is the rhythm, what is the dynamic?" I could think about sound, what type of sound I wanted. But I still think maybe I lacked some sort of confidence or some inspiration of how to do that. So the poetry gives me the sound world of the instrument. So rather than just experimenting with the instrument like I would do with sounds that I record, the poem gives me a place to put the instrument. So for instance, I have an alto flute and live electronics piece called *Among Fireflies* based on a haiku by Wally Swist:

Dense with fireflies

The field flickers

Through the fog

And when I read that haiku I started thinking about all these different kinds of sounds. The flute sounds in the haiku to me just [claps] boom! They just hit me. Dense with fireflies [imitates fly/buzzing sounds], the field flickers [imitates flickering sound], through the fog [imitates fog sounds]. So I was able to use the haiku to come up with instrumental ideas that somehow I didn't have otherwise.

JM: And it's such a visceral haiku too.

EL: And those are the ones of Wally's that I gravitate toward. And there are other poets whose work has inspired me, primarily because the instrumentalist I'm working with found poetry that they liked that I also liked. There's part of that collaborative experience. So it just depends, it is all different based on the project and the people I'm working with.

JM: You mentioned being inspired by composers and your BGSU colleagues. Can you comment how you have been inspired by role models and colleagues throughout your life?

EL: I was certainly inspired by my organ teacher, who taught me lessons in performing, in composition, and in professionalism. She used to say "always play with authority and if you make a mistake, make it with authority. Perhaps when you make that mistake someone will be coughing or their chair will squeak and no one will notice." She was really fantastic. Later I went Northern Illinois University (NYU) in DeKalb Illinois, a little farming town. It was a very experimental environment and it was because of that environment that I ended up where I am today. I think that everything that happens to us influences us somehow. The composers on faculty at NIU had been students at the University of Illinois during very experimental times. They were involved in the Harry Partch ensemble, they worked with Sal Martirano and Herbert Brün. They absorbed this really avant-garde type of mentality in music making and concert

production and they brought that environment to Northern Illinois University when they started teaching there. We produced all kinds of crazy happenings and concerts and there were different people visiting, and it was a very vibrant experimental environment. I think that all the people there and the environment really taught me to think outside the box, and that was important to me. I later went to the University of North Texas for my doctorate, where I studied with Larry Austin. Larry taught me a lot about professionalism, and he taught me a lot about working with technology and about experimentalism, but in a different way. And then I went to The University of Birmingham England, where I studied with Jonty Harrison. It was there that I really learned how to refine my techniques as an electroacoustic composer and how to listen more critically, and how to work with technology in a more virtuosic way. I was exposed to a different type of electroacoustic music and of course to sound diffusion. I also learned a great deal from my other mentors at the University of North Texas, John Christopher Nelson and Joseph Klein, who were wonderful in helping me think about structure and taking the experimentalism I learned and finding solutions for how to reign it in and place it into the proper context, and into an appropriate context for whatever it was that I was trying to express. All of these people had influences on me in who I am now as a composer. I also studied later with Pauline Oliveros and did Deep Listening which helped me learn how to think about the experimentalism as a more expansive way. I always thought about experimentalism in a more aggressive, foreground way, like "Oh we've gotta do this and that and this!" But she taught me how to think about sound in a "Deep Listening" way! I learned how to be a deep listener, and that also influenced how I worked.

JM: And Oliveros has influenced entire generations of composers, performers, and people.

EL: Yes, without a doubt.

JM: Regarding Northern Illinois and its experimental atmosphere, can you provide some context about the actual environment and technology that you used, since studios are so much different today with the revolution of the laptop. Did that play a role as well?

EL: Absolutely! We didn't have laptops back then. This was the 80s! [laughs] I remember Finale 1.5! So when I got to Northern Illinois University there were three studios at that time. We started with analog tape manipulation. There was a studio with reel to reel tape decks and we learned how to use them. I remember one project that I made. We made all these different tape loops that went around the room. You go all over the building and find mic stands and music stands to prop up the tape so you can have tape loops going all around the room. Then after the analog tape manipulation class, where we learned how to cut and splice tape, came the analog synthesis class. There was a Moog Synthesizer, there was also an ARP 2600 synthesizer, and there was a little Buchla Synthesizer as well. I had no idea what I was doing at that time! You know how people ask "Would you ever want to go back, would you ever like to go back to high school?" NO WAY! [laughs] But what I really want to do is have the knowledge I have now and go back to being the student I was to say "I know exactly where this oscillator output goes! It goes here!" But at that time we were learning and using the Allen Strange *Electronic Music* text, which is an amazing book, but I think I just didn't quite understand it at that time. I was plugging things in an out and saying "What happens when I do this?" That experimentalism, you know, based on not really understanding what you were doing. You run into these happy accidents of "Woah I didn't know it was going to do that!" when really if you knew what modulation was you would know that it was going to do exactly that thing that it did if you only had the understanding of how all these things functioned.

There was another studio that had a PDP-11 computer in it. I started doing Forth and J-Forth programming and moved onto PCs where we did Basic and Visual Basic, and moved into C and C++ programming. Northern Illinois university had this broad spectrum of technologies at that time.

JM: And as you reflect on your mentors, and with it being your twentieth year of teaching at BGSU, how do you see yourself as being a role model?

EL: I think that all of the things I learned from my various professors and my experiences hopefully have synthesized into some combination of encouraging my students to be explorative and to experiment, but also to value quality and thoughtfulness and to listen to themselves and really listen to their music. And to think about SHMRG. Sound, Harmony, Melody, Rhythm, Growth. How all of those come together, why we use technology, what function does it serve? Just as we would say "Why am I writing for saxophone? Why am I writing for piano?" To really ask those questions. Then when we give ourselves an answer "well because I want to" if that is the answer, "because I want to write for saxophone today." To just ask "what do I have to say?" and to be strong and intentful in whatever it is they are saying.

JM: With your students and alumni, you seem to have created a family. Could you talk about how you approach this kind of dialogue, especially since we can so easily isolate ourselves in the composition and music world. It seems like you try to break that isolation and I was hoping you could speak about that.

EL: Certainly. One of the things I say to young students who to audition and who say "I want to be a composer," I often talk to young people when I have the opportunity and say "being a composer means that you really have to be ok being by yourself." Because composition, not for everybody, but for many people is a very solitary thing. I spend hours and hours by myself in my

studio with my papers sketching things out, with the computer processing sounds, programming

Max patches, working in Sibelius getting things to look good, all of those things. It's a very

solitary existence as a composer, and one could say the same thing is true of instrumentalists.

You need to be happy and content spending hours and hours by yourself in a practice room. But

then, what happens when it's time to take your music out to people? What happens when it's

time to sit down with the saxophone quartet, or you are performing with a chamber group? You

have to be able to interface with people. So in a certain way you have to be multiple people. You

have to be happy spending extended periods of time alone, but you also have to somehow find

the ability to be comfortable around other people. I think BGSU does a very good job of valuing

and promoting community. Certainly you saw a great deal of that in the saxophone studio here,

of community and community building, and we do it in composition as well. We have our studio

classes, our students spend time together outside of class, we have guests and then we go out

together, it is just part of our culture. And it is part of the culture that I have chosen to value and

to try to nurture and grow.

JM: As we become more socially aware, as large institutions and on a personal level, how do

you define inclusivity and diversity and how has it changed in your field and does it reflect your

recruitment efforts.

EL: I am happy and thankful to see that the question of inclusivity and diversity is one that has

gained in prominence over the years. I remember going to ICMC in 1995, in Banff. It was my

first ICMC and I went to a paper session given by Mary Simoni, who is now a Provost at

Rensselaer Polytechnic Institute (RPI). Mary Simoni got up and talked about this very topic of

inclusivity and about being more inclusive to women. And that was the first I had ever heard

about anything like this. But in looking back on it, I don't think I really knew there was such a

thing as women composers. Or maybe I didn't think about it or it didn't come into my awareness. When I was an undergrad student, I listened to some of Pauline Oliveros's music, I knew about the composer Elaine Barkin, I had heard of Laurie Anderson who came to Northern Illinois University I was there. So I knew that there were women in the field but I never thought about whether or not there was an inequality. It just wasn't part of my conscious thinking. I just did what I did. So now I am glad that people are talking about how we cultivate greater diversity in the field, how can we be more inclusive? Not just in the people who are creating the music, but how we are more diverse and inclusive with our audiences, with the people who come into contact with our music, in the venues where we perform? So when we think about inclusivity and diversity it's not just about us as composers or us as performers but if we think about it in a bigger way, outreaching to audiences, greater diversity with our audiences, greater inclusivity with where we play our music. I think that we have come a long way. There are many people who feel, and rightly so, that we still have a long way to go. I think that this will always be true. I think there will always be room for us to improve. Just like there is always room for us to be better performers and better composers. We will always need to do better to be more inclusive, to be more diverse, and to be more welcoming to people who don't have the same experiences or access that we have had.

JM: You often get the label "women" or "female" composer as opposed to just composer. Have you ever had that labelled unwilling on you, or do you always see yourself as just a composer, as an equal? Have you had experience with this?

EL: I have always considered myself to just be a composer. And I think the fact that I am a female is just who I happen to be. I consider myself to first and foremost be a composer when I reside in the field of professionals. I am a composer, that is who I am, that is what I do. That is

how I identify. The label "women composer" or "female composer", people use that when they talk about me, and that doesn't offend me. The only time it offends me is if they were to say "we need a piece by a women composer let's program Elainie's music."

JM: So you do not want to be a token.

EL: No. I think that is the danger for us is when we say "we need to be more diverse, we need to be more inclusive." I agree one hundred percent but I guess I would say I want my music to be programmed because it is the music you *want* to program. Because it is the kind of music that fits, because you feel that it has value, it has the value that you are looking for in whatever this concert or festival is. Not because you need to be more diverse or you need to be more inclusive and I somehow fit that role. That is difficult because there are people who say "I don't care." And that is a very valid viewpoint as well. For people who say "I don't care the reason that my music is performed as long as it's performed." I respect that. I would rather my music be played because of the value of the music and not because of my gender identity. To me that is where things become difficult. But everyone must choose that for themselves.

I sit on juries where people say "we need to try and make sure we are more diverse and inclusive in our selections." I absolutely agree -- one hundred percent. However, what does that mean if in being diverse and inclusive, the person who has the best piece isn't the winner? So you have to look at these situations from both sides of the equation. And I don't know the answer, I don't claim to know the answer. But what do you do? Maybe there are situations where you don't need to sacrifice quality to get the winner. Your diversity and inclusivity plan resulted in the winner who had the best piece who represented that population. This is always what we hope for or course! But what happens when that is not true and what does that mean for that composer? And by "composer" I mean that male composer, or that female composer, Asian (or

fill in country or culture name here) composer, African-American composer, trans composer, or that non-binary composer. When you start prioritizing the label you place on a composer or that category you place them in, instead of prioritizing the music, what does that do? I don't know. I am not saying that as a means to suggest that we shouldn't be more diverse or more inclusive. But I wonder if the process of labeling or categorizing composers, although well intentioned, might result in a different kind of stereotyping or de-valuing.

JM: I get a sense that for you it is always an obsession with the sound and to also never forget that in our discussions about this.

EL: Thank you for bringing us back because I see both sides of it. I see a situation where the world of composition has been male dominated for so long. Do we need the pendulum to swing? Absolutely. But what is it about at the end of the day? Everyone has to answer this themselves and choose what's important to them.

JM: Could you talk about your work in SPLICE? Getting the pendulum to swing the other way is outreach. So there is the SPLICE Ensemble, the SPLICE Institute, the SPLICE Festival, and now the SPLICE Academy. I was hoping you could talk about the outreach of SPLICE.

EL: I will say first of all that SPLICE was the brainchild of Chris Biggs and Keith Kirchoff. I am simply a member of the team; SPLICE wasn't my idea. I think SPLICE is a great example of community building, of finding something that people are interested in, mainly composing and performing using technology, and building a community around that endeavour, around the interest. We have the summer institute where composers and performers come together for a week of collaborative performances, workshops, working together, hanging out, eating meals and staying in the dorms together, building that community. We try to push that outward beyond the summer Institute through SPLICE Festival, which is open to all people to apply, composers,

performers, composer-performers. The festival takes place between summer institutes, as a way to keep things going and to expand outward beyond the institute. Then there is SPLICE Academy which seeks to engage younger audiences in creating music using technologies. The first camp took place in Summer 2019 at Temple University hosted by Adam Vidiksis, a member of the SPLICE organization. Members of the SPLICE organization taught high school students about how to be creative using technology. They also learned about recording techniques and microphones, so not just the creative side but also the technical side to try to bring the awareness about different facets of audio technology to younger audiences. The SPLICE Academy took place concurrently with the Young Women Composer Camp that Temple hosts annually. So we had some young women from the Young Women Composer Camp who took the SPLICE Academy track in the second week as a way to further try to expand or be more inclusive or diverse by bringing women in at a younger age. Then of course there is the SPLICE Ensemble that performs at the institute, festival, and academy. They also perform independently at conferences and festivals, so are great recruiters for the SPLICE organization. They also help broaden the sense of community we try to promote through SPLICE.

JM: Have you ever thought about the way we talk about music technology? Since much of the audio technology is derived from wars, and we have very aggressive terminology. Execute a program, kill switches, master and slave controls, female and male cables. Do you think this has an impact?

EL: That is a very good question. I find myself increasingly more self-conscious as the years go by when I talk about certain aspects of music technology. In Music Technology I, I teach MIDI networks and I have to talk about the master-slave paradigm. When I teach students about cables and connectors and we talk about male and female, I find myself increasingly more self-

conscious, but I can't change that vocabulary. That vocabulary has to be changed by acclamation, I think. I can't start teaching my students something other than the established norm for describing what these things are. Because they will go out in the world and say "that is a TRS convex cable! And this is a TRS parabola!" [laughs] You have to remember also that music technology is a subset of a larger world of technology in engineering and telecommunications, electrical engineering, and physics. And so it's not so much that the world of music technology has to change, it's that the meta fields from where music technology has come need to change the way that *they* label and describe, they need to change their vocabulary.

JM: And Python got rid of master and slave. I cannot remember what they replaced them with, but there are signs of change, it is just slow.

EL: And you could call these things the manager and the client. That could be a substitute. But it's true. The world is flawed, life is flawed, we are all flawed individuals dealing with an imperfect system trying to function the best we can. And everyone deals with this imperfection in their own ways. And all those ways are valid ways. When people get on their soapbox and they yell about these things I say "Good for you! It's important to you! Say it, do it." I think it's important for us to acknowledge and support each other in those endeavours. I think that's the most important thing.

JM: What do you think is your biggest accomplishment so far in your field?

EL: My biggest accomplishment are the Bowling Green State University (BGSU) photos we take annually at SEAMUS featuring big groups of students who have been successful as composers, as music technologists, as performers. I go to SEAMUS, and to other festivals, to see the BGSU students, the BGSU alums who are represented there, who are composing strong music, who are winning prizes, going to great grad schools, getting jobs. I think that is my

greatest accomplishment -- that as a teacher I get to see the success of my students. They all get to know each other, support each other, and applaud each other. That's my greatest success.

JM: And it is wonderful to say that on your twentieth year of teaching.

EL: That's true. I love composing and sharing my music and creativity with performers and audiences. But the thing that really counts I think is to see other people succeed and really grow as creative individuals, as professionals. That's the best reward.

Interview with Jess Rowland

10/17/2019 – 5:30PM EST, Peaky Barista (2680 Broadway, New York, NY 10025)

JR: Jess Rowland

JM: Justin Massey

JM: How did you first become interested in music and audio technology?

JR: I guess I was always interested in music. My Mom is a musician and I was forced to take piano lessons which I hated. I always didn't show up. As soon as my parents gave up on me I became really interested in piano and I taught myself. The only reason I learned piano, and the only reason I learned any technology at all is because I want to make my own music. I didn't care about playing piano, I wanted to write a song. In my house growing up that was pretty much the only way that could be done. So I had to learn piano so I could write a song. For me, with technology, that is mostly the case. I mostly learn technologies and use technologies because it is just a means to an ends. I find the technologies interesting in and of themselves but I think that is just a secondary interest for me.

JM: Was there a specific instance of "the hook" with technology, or has it always been there?

JR: It was always there. My practice these days I mostly build circuits and flexible circuitry. Making a complicating together a visual design and music and composition and interaction. Mushing it all together. It's kind of this thrill about breaking down barriers. Like composition is this and a musical instrument is that and a speaker is this other thing. I really enjoy just messing with the whole idea that things don't have to be exclusionary. The way I got into that was after

working in music for awhile and I decided to go back to school to get my MFA in visual art practice. I don't know exactly what compelled me to do that. And I had an existential crisis. I was like "Well I'm a musician, I like to make music, I'm a creator of music" and "what am I hoping to achieve in this art program?" I really just had a hard time with it. It kind of all came from a dream. Quite literally a single dream I had one night. It was a dream where I was screen printing. It was this really large print I was trying to make. It was a medieval sort of illuminated manuscript, but a huge kind of thing, of this woman, maybe she was a queen or something. She was regally dressed in all these fabrics and these intricate designs. With screen printing you have to put down one color and then the next color, it's this sequential process. And what was happening was as I was putting down colors it was making sounds. Based on the color and the pattern of the fabric. It just had kind of an aura of sound. The more I worked with it the more sound there was. The more different it was based on the different patterns in the print I was making. I woke up and then I was like, "I want to do that, that's what I want to do." From that it was "how do I do that?" This is where the technology came into play, and again it was just a means to an end. So I had to think about how does sound come from an object like that, how can sound come from paper? So I started building paper speakers. How will I make it more and more just sound? I don't want parts. I don't want a magnet and a voice coil and a diaphragm and this and that. I just want a thing to make sound, and I want it to be kind of two dimensional. I have basically been working on that for the past six or seven years. I do other things too, but that is a pretty good example of something I focus on a lot in terms of not just working with technology but to invent technology. I don't really enjoy technology as given to me. There is this fundamental interest I have in whatever rules people have about things, I just want to get rid of them, if possible. Rules about what counts as music, what counts as visual art, what counts as

composition and what doesn't count, who can make music, but also just "this is what you do with this piece of software" or "this is how this thing is supposed to work." What if it didn't work that way? What if you made it work some other way altogether? I kind of have a love hate relationship with technology in that sense that it is something that is given to me, like corporations have made things and they are supposed to work a certain way as music technology. I am really fascinated by that but I also just need to make my own thing. I need to create my own technology reality.

JM: Like a DIY approach?

JR: Yeah, exactly. A lot my work coincides with the DIY movement a lot. Which is a happy coincidence, I'm sure it wasn't just a coincidence.

JM: The DIY movement really started in the 90s when it became more affordable to get technology.

JR: So I was on the late edge of that wave. I was building the paper speakers around 2010.

JM: With the idea of rule breaking, your bio mentions that you are a composer, sound artist, performer, puppeteer I think it says

JR: Does it say puppeteer? I have worked with puppets but just very badly!

JM: So this immediately is breaking the mold of "I'm an academic composer and focus on one just one practice." Could you go more in depth about your multi-disciplinary approach that was inspired from your dream? What was your very first multi-disciplinary project?

JR: Like I said I started learning piano myself for my own ends. I really liked Dr. Domento. He had a radio show that was all novelty music. From that I really got into Frank Zappa and a lot of other things too. He had a novelty song, like top five. Each of the introductions to the number five, four, three, two, and one were all from a Harry Partch piece. I forget the name of it now but

it's the piece that goes [sings piece] "number three." So I went from Dr. Domento, weird Al Yankovic, Frank Zappa, Harry Partch, all this weird stuff, all these weird connections were being made. You know funny songs, that a little kid would like. I was so fascinated by Frank Zappa's *It Can't Happen Here* with the multiple voices and everything and I was like "I want to make a piece like that!" I immediately realized that it was just me, I didn't have anybody else that would want to do that, but I did have a boombox. This was the late 70s or early 80s, but you know what I'm talking about with the two speakers and there is a microphone. I was like "How do I do this?" I didn't know four track recorders existed, I didn't know anything. All I knew is I had this boombox and my brother had this stereo system. What I did was wrote out the piece and then I recorded the vocal part, it was all vocal parts. Then I took the tape, rewound it, put it in my brother's stereo, played it, and recorded back onto the boom box the sound of the stereo with me doing the next part. So I must have done seven or eight tracks and it didn't really work. Obviously the later tracks were a lot louder than the earlier ones. The first one I had done you could barely hear in the background. But I think that was the first thing I tried to do with technology. It was always kind of an improvisation. There has always been that

JM: And the improv has carried through your work today.

JR: Yeah, it's mostly improvisation, I mean mostly structured improvisation. I don't think I have the patience or the focus or something, or I'm just not super into tightly structured notated music and stuff like that. There is also for me something really special about improvisation. Everyone who follows a creative path in music must have had, I could be wrong, some sort of semi-spiritual experience with music. Something that really meant a lot. That happened to me. I got this sense of a musical energy, and it was something that happened spontaneously. So I was really interested in the spontaneity of coincidence and finding that sort of flow, that musical flow

in whatever time and space I happened to be in. That became a really important part of my musical experience. Especially in the 90s I had a band called *Spork* and we were almost entirely one hundred percent improvisational. I wanted to recreate some of our improvisations and I could kind of coerce the other folks in the band into doing it a little bit, but they mostly wanted to keep making weird stuff that wasn't structured at all. And somewhere in an attic somewhere are just boxes and boxes of tapes cause we recorded everything, and CD's!

JM: You have mentioned this already, but the how and why you include music technology in your works. It seems essential.

JR: Yeah, and it's not like everything I do is that way. I enjoy playing piano or playing guitar or expensive things. I have a lot of friends who are way more interested in the technology than I am. And I think that is part of why I don't go to the conferences and the academic things that much. So much of it is about those specifics which is great for people that get into it but for me I just want to do my own thing. So yes technology has always been a big part. And it's not so much I use technology as I question technology. I do something where I smash laptops, weird things like that, sonifiying google spreadsheets.

JM: Being this multifaceted artist, incorporating technology, visual art, performing arts. How do you even start a new work?

JR: It helps to just keep a notebook of ideas that might cross my mind. Even if I don't particularly like an idea or if it doesn't feel like a full idea I still jot it down. That is helpful, I will look back to my notebook and be like "Oh I forgot that I really like that thought." These days it is really particular to the circumstance. For example I have a show coming up at this gallery space in Princeton. It's this huge, huge area, it's way more, I'm terrified because it's like "how am I going to fill this space?" But I started thinking about that particular space. What does

this space want? What makes sense here? For me I already have a through line of a practice of particular techniques and particular themes that I am interested in. So I think about how those interests and ideas can speak in that space. I am thinking of doing for the Princeton thing is, I wanted to make a really large flexible circuit design. I'm usually limited by the size of the paper, there are a lot of limitations that go into how big those things can be. The cutter plotter has a maximum width of two feet or something. But what I can do is use the walls of those space as a canvas. So what I think I'll do, if I can pull it off, is come up with some circuits that can kind of weave around the whole space. So that there isn't that sort of rectangle restriction of what I can do. So where do the ideas come from I can't tell you, but I did have that dream for example. That was pretty different than how it usually happens for me. But it was one thing that happened. That was definitely me trying to figure something out in my mind on a subconscious level. For me a lot of it comes from interesting things I notice in the world. Whether it is an interesting, funny sound, and I always keep an eye out for technologies. How can I use that, how could I use that? There are a lot of machine learning things that are going on out there. Everybody wants to use them for machine learning, nice reasons, but what if it was not used the way it was supposed to be used? These kinds of questions. I don't know where ideas come from. But for me these days a lot of it is kind of specific to whatever project I'm being asked to do, or you know if there is a grant that is asking for specific things. I tend to tailor things more than I used to particular instances.

JM: A lot of your work has emerged outside of academic circles. You got your MFA but you still have separated yourself from academic circles. Did you have mentors and role models, and is this an important thing to have as you work with your artistic practice.

JR: I think mentors are crucial, they are really essential. If you haven't found one yet then that is really unfortunate. I have to say, I found one only out of the sheerest of luck. I could have spent my whole life without someone like that. Adrian Freed, who I already mentioned, was really a mentor for me. And I feel like I was just very lucky, it was just a stroke of luck and being in the right place at the right time. Just the right circumstance that we were both there. But there is a lot in that question so let's take a step back. I was out of school for like 10 years, more than that, 15, before I decided to go back. So I was working as a musician, as an experimental musician, performance artist completely outside of academia. Not using any of the language of academia, not using any of the structures or social contacts. It was just me and the community of people I knew in San Francisco. So it was a huge adjustment actually to go back to academia. I have such mixed feelings about academia. There are so many problems with it. I think the main one is that there is this sense that, I'm going to totally generalize, that it thinks of itself as the center of things. And I know for a fact that it is not. I lived my whole life without giving a whit over what happened in school. You know people with theories and reading things and knowing all the right names and all the blahblahblah. So when I encountered that it was a cultural shock actually. I feel like I haven't let go of the skepticism of academia. But what is weird is that I am in it. So it is kind of like biting the hand that feeds me a little bit. Well that is exactly what it is! But I think it is really healthy to have healthy skepticism about the academic world and what it means. Some people that I know just get in the bubble world and think the only thing that matters is the academic accolades or whatever those things are. And I could kind of care less about that. I would much rather just make something that means something to someone, and to have someone care about it. I would also like to make a living and put a roof over my head. Aside from the pragmatic necessities of being an artist, other than getting paid, the only thing I care about at the

end of the day is that someone was like "that was cool" or they thought there was something important in it that they want to hold on to. It's just making a human connection and letting people know that they are not alone, essentially. I think that is what keeps me going at the end of the day, if I can connect with someone like that that is great.

JM: Have you ever thought about the flip side now being a professor at Princeton and having a status in the artistic world that you can be a mentor to others?

JR: It's kind of a mind fuck. I am a professor at Princeton now. I can say all this stuff to you and then I can go to class and say how important musique concrète is or something like that. It is a weird kind of dissociation, like two worlds that sometimes just don't talk to each other. There is something really nice, Adrian Freed was a mentor to me because I went to school, so school can be a source of really valuable stuff. And I didn't have the idea about flexible circuitry until I went back to school either. It changed my practice in a really good way, I got a mentor and that was life-changing. So I don't want to dis it but having a healthy perspective on it, especially in terms of your artistic practice, not letting that bubble world become the thing you care about in your work. As for mentors, I would love to be a mentor to someone else. That would be great. If I could or if anybody feels that when then I've done my job. There are gender queer folk and a lot of women in Princeton who are interested in the kind of stuff I can teach them about. I'm starting to find those students and that is especially exciting for me because I never had that.

JM: And what is the importance of having someone like you as a role model?

JR: I think it's crucial, I think it's really important. For me my role models were Laurie Anderson and a woman friend of mine who was about ten years older. I always looked up to her as where I wanted to be in ten years because she was always super cool and doing super cool stuff. But I didn't have a trans woman role model or anything like that. I actually think that is

really important. I think it is really important that you find that because it is again about not being alone. There are certain experiences and language that only certain people can rock. I felt like that was something missing for me. I have a composer friend Meg Schedel, she works at SUNY Stoneybrook and she was doing a survey of queer women, electroacoustic musicians and performers about mentors. What she found was that pretty much everyone she asked with just one exception had a male mentor. She was like "yeah that is kind of messed up." Do you think in twenty years that will be true though? We kind of came to the hopeful conclusion that will isn't going to be the case. It means that women and queer folk, and everybody who isn't the patriarchy, that that would be healthy, that would be representative of a non-exclusionary, inclusive space. That day is probably little bit off in the distance. It would have made a huge difference for me. It is not just about the music or the art, but about living a life.

JM: How do you define diversity and inclusivity and equality?

JR: Yeah, what does that mean. Here is the thing, I think, this is where it gets tough because I don't know. The question I immediately ask is like "why are things the way they are now?" For example I've definitely had the experience that you had that a lot of these spaces are very white-male, straight situations. Why? Like why? I wonder what the barriers are. I guess I can answer this for myself a little bit. Why I felt excluded? I think that is a question I can actually slightly answer. It's things like there wasn't' representation. At CNMAT there was nobody like me.

JM: Is this general queer representation or specifically trans representation?

JR: Both, and representation of women too. I think maybe something like a space where you don't have to think about those things, you know what I mean. A space I could go into and not feel, this is weird. I think there is bias too actually. There is a lot of sexism, explicit and implicit

in those worlds. I think a fair amount of transphobia too. I've heard things people didn't think I was hearing, but I heard them. There are some people and that is part of their experience.

JM: They don't exist in a vacuum either. You said in your interview with *I Care if You Listen* that it impossible to tell where the sexism leads off and the transphobia starts.

JR: Exactly. It really is all part of one piece. It's intersectionality. I am a big believer in that. It is all connected, racism, sexism, transphobia. It's different variations of the same issue. They are all connected. That is an important aspect of it too. Thinking about things being intersectional in the sense that the fight for inclusivity can also not be exclusive. That even means including our allies among the white straight men that really care. Adrien Freed is that way and a lot of other people. I think a lot of people would just rather sweep it under the rug and not deal with it.

JM: And it is extremely important for queer people because there are just less queer people in the world so you really need your allies.

JR: Yeah, there is a little bit of a numbers game there. But when it comes to representation of women that's fifty percent of the population. That disparity is just so clear to me. I was hanging out with some friends, we have a performance group together with two women, and there was some guy who we were talking to after the show who worked for some music technology company that was trying to find women, he said he was having a hard time finding women to be part of the company. I got a little frustrated because I know so many women who know so much about these things. It's like, dude you obviously just aren't looking hard enough. Like you're talking to three people who know about that software right here, all three of us, and we each know twenty friends that also do this. So it is a little bit of a mystery to me too. I think people have to also do a little bit of work. It is not just about "well we would love to have women at our

software company but where are they?" Just go find them, they are right outside your door. So good intentions aren't enough either. It has to be an active practice.

JM: Do you think your artistic practice is defined by your trans identity or by the community you have built for yourself?

JR: It is definitely defined largely by my community. I think it was really essential, actually, for my artistic identity to emerge. The conversations and the community of my friends and the people who were also trying to figure out who they were as artists. I spent most of my life in San Francisco and I feel like my work has always just been very specifically San Francisco or West Coast form of anti-commercialism and very progressive take on cultural issues. I really feel that all my questioning of technology is very closely tied to questioning of consumerism as well. Those things are super connected, it's almost like technology is consumerism these days. It is most of what we buy and purchase and it's massive companies that control these. As for my trans identity, I have always kind of thought of it as separate. I couldn't see how that fit into my art, or how I thought about expressing things. Maybe just a few years ago I was talking to a curator, and she asked me about this. Sometimes under the wrong circumstances those questions can be pretty annoying, but she was really thoughtful about it. She started asking me about it and I said "I don't think so, I don't think my being trans has much to do with my art." Then she asked me "What about this?" And I realized maybe it's all about that. For example, one thing I do is building these sort of sound objects that didn't make sound unless you leaned in close and listened really closely for these things that probably shouldn't make sound but if you were really actively interested you could find sound in it. And I started thinking about that, and it is kind of my experience. I spent the first twenty years of my life not speaking. I mean that has got to affect you right? So when I talk about making speakers, paper speakers, and things that make sound, it

is like that is what happened for me, I started to make sound, literally having a voice. Just quite literally this voice coil wasn't working before. So what does it mean to make a sound? What is sound? Who gets to make sounds? That is a big part of it. It was staring me right in the face and I just thought, no it's not. But it actually pretty central even though I wasn't aware of it.

JM: That makes sense that it would be in the depths of who you are, why should it be front and center when it's just part of who you are?

JR: Yes, it's like, does the fact that you have blue eyes affect your art? Yeah that doesn't no. And it should be like that in a perfect world. But we have experiences.

JM: And often the experience of being closeted affects how you see the world. It often gives queer artists ability to work by themselves.

JR: As opposed to collaboratively?

JM: Not quite, but being alone is something this community has experienced and they can become comfortable with that even if coming out of the closet is breaking those barriers.

JR: I definitely have trouble with collaboration. It's funny I was just at Oberlin and talking to a composer whose name I can't remember, maybe Peter. He was saying that he was the exact opposite, that he can only work in collaboration and I was kind of blown away. I was like, wow what is that like? Maybe that is part of it.

JM: Every person is unique, so we cannot generalize about everyone.

JR: No, but it is an interesting thought.

JM: Could you speak about your experience of feeling othered in the arts?

JR: It's a tough one. It's something I feel like I live with every day. It's kind of like breathing. What's your experience with breathing? It feels like a constant noise to me. There is just this background buzz that is just always there. And I can ignore it, I cannot pay attention to it which

is great, but sometimes I'm reminded it's there. These days I feel like it is better than it used to be, maybe not everywhere, but it is way better. Sometimes it feels like it really doesn't matter. But I always have a second thought about that. Who are my allies? Can I really trust these people? I just don't know because they don't think about me. So I feel like I have to be careful a lot. And not just in terms of getting hurt but how I present myself too. I feel like people ask "so what are trans people like, Jess does this and this and this." Even thought that is just me but I feel like I stand in a lot.

JM: It's so easy to become a token.

JR: Yeah, a token exactly. I've definitely felt that way. But in the 90s it was a lot harder. Things changed a lot about ten years ago.

JM: Certainly reading a couple interviews of Wendy Carlos, even as late as 2004 books, articles, and interviews don't acknowledge her pronouns properly.

JR: Wow.

JM: In 2004 you think this wouldn't be an issue. So looking back ten or fifteen years I think things have changed, but I only have one perspective.

JR: So like I said I teach at Princeton. There is a trans person in one of my classes. They are in another class as well. A professor in one of their other classes is always saying to them "hey man, hey man, how are you doing?" Like, does he do that to other people? They said he doesn't. That is so fucked up, it is obviously a transphobia thing, it is so obvious. Maybe that professor has issues with himself I don't know. But it's just a really passive aggressive way of denying someone the experience of themselves. And I think the student handled it really well, definitely better than I would have. I was like, "can I stab him in the eyeball?", and they were like "no you can't do that," and I was like "yeah." So I was really happy that they had the maturity level, and

we live now in a world where it is understood that that is not cool, but it did happen and it's happening right now. They are still in that class and that class is happening right now. I don't know, I hope it doesn't affect the student. But yeah, it is still a thing. And it is definitely a thing that happens more to people who aren't in a position of power. That professor has power over that student. And can do that and get away with it because the student's grade depends on that teacher. One of my thesis advisors in school was the same way, actually. He refused to use the right pronouns. I just bit my lip or whatever, I needed him to put his signature on this piece of paper to graduate. So I can't really make a fuss about it, but I definitely never want to talk to him ever again.

JM: I imagine it affects how you think about all academia a little bit, because the power dynamic is so obvious in academia.

JR: Yeah, and it is in some ways specific to academics. It can happen at work, it has happened to me at work. Not as much as it used to, we have gender neutral bathrooms which is great. They are kind of behind the times.

JM: What do you think is your biggest artist achievement so far?

JR: Oh wow that is an interesting one. I don't know if I can point to one thing. My practice has changed so much over the years. I could come up with a top ten and a bottom ten list. The bottom ten could be more exciting and fun to talk about, because we all have our bad shows. There have been turning points, and I think one big turning point was a show at the Berkeley Museum of Art where I showed my sound tapestries that was my first large scale sort of flexible circuitry paper speaker thing I had done. That was a big deal because I worked really hard on those at CNMAT. Those large panels, that was a big practice turning point and I'm definitely still pleased with what I had made. You know, a lot of it is stuff that no one would ever

remember too. Like my improvisation band Spork that has been lost to history. But for me that was my baby, that meant a lot to me at the time. It was huge even though there are exactly two other people on the planet who remember it because they were in the band. But hopefully the best is yet to come.

CB: Carolyn Borcherding

JM: Justin Massey

JM: How did you first become interested in music composition and music technology?

CB: It's a really long saga [laughs]. Initially in my undergrad I started thinking about what I wanted to do for my future. I had done music, piano class, and orchestra in high school all the way through. It never really occurred to me that I wanted to do technology stuff. I went into undergrad thinking maybe I would want to write movie scores, so I joined the music technology program at Ball State. I was learning more about how the movie score community works the industry especially. I was like, "I don't want to do that, I don't want to run around trying to hire my own orchestras to record my music so I can get a scratch track in." That's not me. So what did I want to do? So then I thought I would do recording technology and I'll work in a recording studio. I was still taking composition classes during this time thinking "composing is cool, yeah I guess I like it!" And part of the curriculum was taking electronic music courses. I honestly just threw down some sounds for every project. I didn't know what I was doing, I just did the things that the prompt said I needed to do. Then, over a summer during my undergrad I interned at a recording studio in Indianapolis. I had a huge crisis since I did not like the work at all, I did not like the work culture. And part of that was being an intern, I was making coffee. I knew I was going to be throwing out the trash and cleaning the studios. I did a lot of tech setups and a lot of

microphone setups and worked a little bit with the mixing board, stuff like that. But it was just all dudes. It was just a weird environment that I did not like. So I kind of figured out "now what do I want to do?" and dropped into composition at the last minute. I stayed with the music technology degree but worked on composing and trying to have a final senior composition recital so I would have a portfolio to maybe do grad school or something. I didn't really know at that point.

JM: Kind of leaving all the options open?

CB: Yeah, so it was kind of all of this "ahhhhhhhhhhhhhh." Eventually my undergraduate advisor said I should consider graduate school, so that is when I started thinking about it. He recommended a few schools to me. One of them was a masters program at Western Michigan University. So kind of that way I just ended up in a music composition masters program thinking I was just going to write just acoustic music [laughs]. I went in and was like, "What should my first project be? I don't know, I'm really uncomfortable writing acoustic music so I'll do something for oboe and electronics." I was comfortable in electronics, but oboe would help me bridge the world between electronics and acoustic. So I wrote that piece and everybody was like, "Oh! You're and electronic composer!" I was like, "I guess I am!" I kind of just let it slide, feeling that you are kind of being nudged a certain way. I just went with the flow and needed to let myself open up to the possibilities that electronics were actually really cool and that I really enjoyed doing them.

JM: Your first experiences with technology were with digital technologies and not analog technologies?

CB: Yeah, the studios at Ball State were primarily digital. I remember we did one project on an analog mixing board. But for the most part the digital boards were so much easier to use.

JM: And gone are the days of tape splicing.

CB: Oh yeah! Yup! Although here, apparently at the University of Illinois, only up until two or three years ago, they stopped having to splice tape as a student. We still have some of the tape here!

JM: I did see get tape spliced once in my undergrad.

CB: It's been reduced to "I saw it happen!" [laughs]

JM: It is interesting that the millennial generation will not have touched boomboxes or analog tapes, or even know that technology. It is now a new way of becoming involved with music technology that maybe professors today are not familiar with. They aren't familiar with the idea of how we first get interested in music technology.

CB: I remember, growing up, thinking about analog stuff. One of my brothers had a tiny recorder with a little cassette tape, and I remember being so jealous of that thing. I thought it was so cool. Probably an indication that I should be where I am. We did have cassette tapes, but other than that we didn't really splice.

JM: Do you think about why you use music technology? Why write in this medium as opposed to pure acoustic music?

CB: I attempted to go back to acoustic stuff, like only acoustic. I think now I am a little more open to it. I was so frustrated because it was really boring to me. The violin just sounded like a violin. In the electronic medium I'm working with this huge sound palette. I'm working with sounds that aren't necessarily tied to a physical gesture or tied an instrument. So it creates a mystery, a little bit of an unknown that I really like. I always refer to it as magic. Just this magic that you don't really know what is happening, but you are along for a ride.

JM: How do you work with technology? What software and hardware do you use and what are you composition techniques with electroacoustic music?

CB: Technology-wise, I primarily use Logic Pro to put everything together and also to make some sounds. A lot times I work with recorded sounds and manipulate those either in Logic or in Cecilia, this free program that I love. I love it and I tell everyone about it. I worked a bit in Max/MSP to put everything together and to make pieces shippable, especially when they are for instrument and electronics. But I haven't really used it [Max/MSP] much for composing. It isn't as interesting for me. Now I am trying to learn supercollider both for synthesizing sounds and manipulating sounds and doing live processing. That is kind of stuff I use. For the compositional process, a lot of time it is just taking recorded sounds and manipulating them and see what I get, and seeing if that inspires anything. That idea of going in and starting out fresh and playing around with whatever I get will usually inspire some ideas and often times give me a trajectory of where the piece will go, like from one timbral area to another, for example. Mainly, I just try to make a lot of crazy sounds and see what happens!

JM: What is it about Cecilia that you love and about Max/MSP that you are not so thrilled about?

CB: I really like Cecilia because it has all these different modules within it that you can just use to primarily manipulate sound. There are a few options to synthesize sounds like sine waves and stuff like that. I especially love their granulation modules, just because they just sound really nice to me. I use it all the time. I'm like "I should probably change before people are going to be able to say 'that's another Cecilia thing.'" It is also pretty easy to use, every module looks pretty much the same with the knobs and faders. I find it really useful and pretty easy to make a lot of things quickly. With Max, I like that program for controlling and sending messages, it feels

somewhat intuitive, figuring out where everything is going. On the audio side of things, trying to develop effects, I get bogged down in it really quickly. And that could be because I'm not a super Max wiz. There is so much behind the scenes of every object that you have. You have to go into the objects help file and then go into that object's, object's help file. There are so many layers that I have to put in, then put in all the patch cables. It is a lot of just clicking and….yeah. And then things just don't work. And sometimes they don't work and don't give me any errors as to why it's not working.

JM: So you end up getting bogged down in work without actually creating sounds, or creating good sounds.

CB: It's also trying to make different effects in it that are really CPU intensive. And it's probably my coding style that is not efficient. But it is very easy for me to get bogged down in Max.

JM: It is also interesting because you can only render audio in real time in Max too.

CB: Yeah. I haven't really thought about that but yeah!!

JM: You already answered my next question, how do you approach an electroacoustic composition? Is there a difference between writing an electronic part and an acoustic part? You work with pre-recorded sounds and are able to make your own sounds, but with an acoustic instrument you are dealing with someone else who controls the sounds and relying off second hand knowledge of sound.

CB: When doing a work with an acoustic instrument and electronics, there is a lot of that. There is still the standard of traditional notation. I usually start by developing a lot of sounds with the electronics and then simultaneously developing motives in the instrument part. Those then start bouncing off one another. If there is a really interesting melodic part in the acoustic instrument

then I try and do something with those same pitches in the electronics. Also try to match timbral gestures with the instrument and the electronics so that there is always a kind of back and forth between the two that ties it all together. That is a lot of it. I like to try and give the performer the freedom to control the trajectory of the piece.

JM: So not always a click track that strictly limit the performers?

CB: Yeah. I have a couple of pieces with click track. My oboe and electronics piece was click track, and then I have a bass clarinet and electronics piece with click track as well. I noticed that with the bass clarinet piece I created moments that had to line up exactly, which is why the click was there, but then there are gestures in between that go from this note to this note, and just do a wiggly line kind of thing. So there is still this element of freedom within the click track. I've been noticing more that my music was looking more and more new-complexity-ish. It was getting so precise with what I wanted to have happen. It is not where I want to go as a composer. I think that is really frustrating for performers, especially when I really want this kind of rhythm and it doesn't have to be exact.

JM: So it becomes the type of gesture and how it gets notated.

CB: Yeah. And partially cause I'm still young in my career!

JM: You have studied at Ball State University, Western Michigan University, and now at University of Illinois Urbana-Champagne. Throughout your studies, have you had mentors and role models, have you sought them out, and do you think it is important to have one?

CB: I have not had any formal mentors, where I go and say "hey will you mentor me?" or establish a formal connection that way. But definitely, I was thinking about this a couple of days ago. There have definitely been a few people. The first one I remember was my advisor, Keith Kothman, in my undergraduate at Ball State. He was my undergraduate advisor and the one who

said, "you should consider grad school," and also recommended Western, among a couple of other schools. We are still in contact a bit about school things in general. When I was looking at doctoral programs I remember he reached out and asked "if you want any help in what to look for in schools let me know," and I was "I'm freaking out that would be great!" [laughs] He was the first kind of mentor that I had. I definitely think that Chris Biggs, Lisa Coons, and Richard Johnson at Western Michigan, basically my committee now that I think about it, they were in different ways all mentors in different aspects of my career and life. Chris was the first person to let me know how a conference works, what you do, the first person to mention that it would be good for me to be at the mixing board during my fixed media piece. Whether you want to change levels or not, you can do that, but you look like you know what you are doing and are representing women in electronic music, that was one of his big points. Lisa Coons was very much a mentor in terms of taking care of myself. She pushed hard and thought critically of music while also cutting me some slack. Also taking no shit [laughs] from other guys in the field or other colleagues who might give her a hard time. Learning how to build up a bit of a thick skin, because I would cry at the drop of the hat if someone was mean to me kind of thing. Learning that no, that is necessary. Richard Johnson was very much the "have you eaten today?" kind of person. He was also one of the best teachers for helping me with live sound, mentoring me on how not to freak out when something goes wrong. So all of these different areas and people have really helped me to make sure I am a professional and a functional human being who takes care of themselves and can think critically about what I do.

JM: You are still a doctoral student, but have you given any thought to how you would be a role model for other people as you become more established in the professional field and even teach classes as a graduate assistant?

CB: Personal advice to younger me would have been to just make up my mind and double major in technology and composition. I know in classes and even in the program in general, and conferences, I've come across other undergraduate women composers. A few times now it has been their first conference. And usually it has been during a slew of conference season where it is the first one of five or it's the fifth one of five. So there is this attitude of just like "I'm almost out of it" or "I just have to push through" So, maybe a little aggressively, I'm still a little young in my career, helped them by giving maybe a little too much unsolicited advice [laughs]. Told them the same things that Chris Biggs told me. Go to the mixing board, even if you are not going to touch the faders, just to be there. Then people will know where you are and clap when the lights go up. Also coming alongside them and telling them that they need go to get lunch, this is what happens. The conference ends, you wander up to a group, join the conversation, and then ask what people are doing for lunch [laughs]. Like all these things that I did not know and had to figure out. I just come alongside these younger women to welcome them and let them know how things work.

JM: How essential is it to have more female role models in such a male-dominated field?

CB: Definitely, it is important. Representation is really everything. I wanted to pretend that if you just want to do something you are going to do it. And that is just a privileged mindset in all honesty to have. To have those other role models, to have those other people to look to and say "I want to do what she wants to do" rather than "I want to do what he wants to do." Your experiences are going to be totally different based on how society and our culture has functioned for so long. It is good to be able to share experiences. At the end of the day I go to my female colleagues and we can rant about sexism or "this guy was trying to explain this basic concept that I already knew!" These experiences that I have tried to rant with my male colleagues about,

and they sympathize and are really great about it, but it is not the same as sharing your frustrations with someone who also has had that same experience.

JM: It is always easier to speak with someone who you share something with. It makes it easier and less awkward. It is also nice to know that you can succeed when you see someone like minded or like-bodied. And of course the need for diverse role models expands past gender to race as well.

CB: Yeah!

JM: The sexism is built into electronic music. When you look at the language we use in software you "trigger" a "bang," "execute" a program. Synthesizer and MIDI have "master" and "slave" terminology and even it used to be that one would "rape a disk." What are your experiences dealing with the gendered language of electronic music, and technology in general?

CB: The "master" and "slave" terminology has always creeped me out, I hated that, even speaking about the timings of the clocks. We have to change it. "Primary" and "secondary" done. I'm sure there would be a whole debate about it. The first time I really thought about the gendered language was in recording technology class taking about the male ends and the female ends. I was like "huh?" [laughs] When it sunk in I just thought "really?" It is way more informative to say the sending and receiving ends. When I finally figured that out I understood how signal is sent places. Having that kind of undertone with the male end and the female end was always just a little weird for me. Even though we were just talking about cables it always sexualized the content of the class. It was just weird. Especially when I was sitting in a class of twelve or thirteen other people with me and one other woman. There are better ways of expressing the function of the technology of this cable instead of gendering and sexualizing it.

JM: The terms send and receive really do just make so much more sense. And this is one of the first times I'm hearing someone reference cables this way. Do you find yourself using these gendered terms, especially when you work in live sound reinforcement situations?

CB: Definitely have used it. It is a standardized language and a lot of people haven't heard of the send and the receive. Other people will say the "outs" or the "ins." That works too. There are still a lot of times I say "I have to run to the studio and get a TRS to XLR male." Trying to change that is a lot of consideration on my part of just trying to change the language of it.

JM: And how you said having a mentor help you learn how to put up with some of these issues. Unfortunately we live in a reality where you have to do that.

CB: When I left Western Michigan and came to Illinois I was really fired up and really wanted to confront everything that had a sexist or representational issue. Which is good! But there was a point where I had to figure out what battles to fight. Otherwise you would be fighting battles every day and that is a huge energy drain that one person alone can't do. I've been learning and trying to figure out what is their intention is, are they being sexist or is it implicit, should I call it out or not? Overall things are good, but coming from a school with Lisa Coons who would take no prisoners, I had that very much in my mind.

JM: Have you experienced feelings of isolation between composing and also being in a minority due to being one of only a few women in classes?

CB: That was especially hard here during the first semester or so. I felt like I was in an ocean of men. I calculated it out after a couple of months that I had only spoken to one or two women in a month's time. It was kind of ridiculous. I had one other female colleague at the time in music composition. We weren't in any of the same classes so I never saw her. And there is no full-time female composition faculty. There is one adjunct, but I didn't know her at all during that time. It

was very weird. All my male colleagues are great and super friendly but I was like, "What is happening right now? I really just wanted to talk to other women." It was very isolating and really hard dealing with the change moving from Western Michigan to here and starting all over not knowing anyone. And then having no women colleagues. It was really strange. I was trying to think of the difference from compared to Illinois and Ball State. I didn't feel isolated there at all. I think that was partially from the undergrad experience, taking all of the theory classes, choir, women's chorus, it felt like I was part of a bigger community. As the communities get smaller and smaller from masters to doctorate you feel that isolation more.

JM: And this certainly seems to be a pattern of specialization. Looking at music as a whole we have issues of gender representation, but zooming in to very specific points seems to make it exponentially worse. Music technology also has an element of privilege to it. Even though technology is getting cheaper and more accessible, it is still a barrier for people to access..

CB: Music itself is like "oh you have the free time to think about music," while music technology is "Oh you have the free time and the money to do that." It is a big thing I have been thinking about recently. I have a zoom recorder, nice headphones, decent speakers, and all this other equipment that costs a lot of money. And these are essential tools for what I do on a day to day basis. How do we bring these barriers down for a wider diversity of students?

JM: How do you define inclusivity and diversity? Have you seen changes in our field, through any action, ideas, or conversations?

CB: Starting with the second part of that question. I think things are becoming more inclusive. I'm starting to hear a lot more conversations about how we include a wider group of people. How do we represent all different types of people? How do we promote different communities? These particular conversations I've heard in composition. And those were conversations I really

never heard in my undergraduate program, which was about eight years ago. I really did not think about inclusivity and diversity in my undergraduate and it is now often the topic of conversation. Especially with groups of SCI and SEAMUS making sure that there is at least one woman composer on every concert. I remember at Western Michigan, Lisa Coons had plans to reach out to schools that were particularly African American and black communities to try and promote that music is an option for these students to diversify the student body. There are movements, it is slow because it also takes big institutional change, changes in mindset, changes in curriculum. Trying to study and teach music of a wider diversity outside of the Western music canon. It is going to take a long time but we have to keep pushing.

JM: Our history curriculums often stop around 1950 because of time limitations in survey course. Even twentieth and twenty-first century courses are male-centered, yet if you search for North-American women and non-binary composers in electronic music in the Fredonia Composer Diversity Database you will get over 700 results. To not have women in composers in the curriculum is to purposely exlude them at this point. Have you ever had a dream of teaching the perfect electronic curriculum or have thoughts from your own education?

CB: I always think of music theory classes. What is a period phrase? What is a sentence? We look at Mozart in particular to study these. Part of branching out of white-male composers requires a lot of analysis and searching for works to teach students about these same ideas by non-white composers. It takes a lot of work and a lot time. A lot of time this doesn't happen because we have these textbooks that apparently teach everything just fine. But it's not teaching things "perfectly fine" because it is leaving out a lot people. When people say that "there aren't composers of different representative communities", well there are. You just have to make the effort to find them, make the effort to program their music.

JM: Lauren Redhead introduces the idea of using queer theory to enhance feminist studies. She speaks about queer process that undergo when a gender minority, such as being a woman in a room full of men, changes their gender or identity to fit into the environment of the room. Can you recall if you have done anything like this, whether it be using gendered language or changing your attire?

CB: I know I do change my behaviour certainly. I wouldn't be comfortable in a room full of men to be the only one in a dress. This just happened recently at a conference. I wouldn't be super comfortable walking around in a dress or a skirt. Usually I try to wear pants and collared shirt, stuff like that. At this conference I performed one of my own pieces. I changed for it and was in heels and a skirt. I felt really strange. I think that was part of it, my audience was primarily male, and primarily a group of very casually dressed group. I know when I'm working with undergraduate men I definitely change my attitude and how I teach. It is much more serious, no jokes. Often times I use a self-deprecating joke to lighten up the mood or bring energy to a class. But especially when it is a room full of guys I don't do that at all because I don't want to give them any room to doubt what I am saying or to question "does she know what she is talking about? It is technology after all."

JM: Are you willing to share a couple examples of sexism that you have experienced?

CB: The first example I always think of really came as a shock to me. Growing up with two older brothers, so talking to guys was no big deal to me, they were my friends, I didn't see much of a difference. In my undergraduate there was this student in my class. We would sit together and would joke around, he would make funny jokes. He seemed really nice and was my friend. Then he basically sent me a Facebook message that was just propositioning me for sex. I was just like "what? No." And then he stopped talking to me forever. I never had another conversation

with him after that. It was really strange to me. I had another male colleague when I explained the situation who just said, "well would you waste time on someone who wasn't romantically interested in you?" So he was basically saying that men and women can't be friends. And here I am in a field that is full of men and he is saying I can't be friends with any of them. Does that also mean I can't be their colleagues? It was a very isolating thing. What can I or can I not be and why are you defining that?

JM: And it gets even weirder combined with gendered language of male and female cables and having to plug them in to each other.

CB: Yeah exactly. It was very strange. I also had a student, one in my masters program, I was meeting with him for a potential collaboration between the music tech and dance departments. He was showing me what he was working on to see if it would be a good thing to collaborate on. But he then basically did a credibility check. Like he didn't quite believe that I knew what I was talking about. We should question where we get our information from, who is teaching us and why, but at that point he was asking me this because I was a women speaking about technology. That has happened a few times so now when I go into a classroom I have to say "this is who I am, this is my educational background, I know these things." And it is really unfortunate that I feel like I have to explain and prove myself.

JM: There is also the idea of being labelled as a "woman composer" as opposed to just a "composer." I'm sure you have been labelled both ways.

CB: I would like to just be a composer. Why does it matter? When we are talking about inclusivity and diversity, then yes, I want to be a woman composer so I can be a representative and a role model. But in the ideal world I just want to be a composer. Just let me composer and don't make some judgement value on my music because I am a female.

JM: I'm thinking about Chris Biggs telling you the reasons to go to the mixing board when your piece is being played, and how intimidating that can be for someone who has never done that before. But also if someone tries to explain how to run the board even if you know how to use it. That seems it would be really intimidating.

CB: When I go up to a mixing board, especially during a soundcheck, and if it a composer or professor who has been in the field for awhile, overall it is just where the signal is coming in and explaining where things are is fine. Usually it's the younger students of the professors who are helping out and assisting who try to over-explain. Often before they start explaining I just jump on and start moving stuff [laughs]! Not in a rude way, but in a wordless "you don't need to explain this to me." The first time I was up at the board it was very intimidating. And it has always been in the back of mind that I have to know what I am doing with technology. If one of the pieces crash, it is going to look really bad. Are people going to say "it's technology, this happens from time to time," not that we shouldn't try to raise the bar and make sure this doesn't happen, or is it, "oh another woman who doesn't know she is doing with technology." I was in a conversation with one of my professors here. His friend, they do a lot of music technology in the community and the school. It was interesting, he was talking about setting up and doing live coding things and how it is so exciting when they are in the middle of a show and something goes wrong, they have to fix it and how exciting that is. I was thinking "you are only saying that because you are male." If I was doing that, and stuff stops working, people would say "this woman doesn't know what she is doing." It was a very clear frustrating dichotomy that I was seeing at that point. I would love to be adventurous but…

JM: There are clear levels of privilege there.

CB: It is intimidating.

JM: I am thinking about all the times I have gone up to the computer to perform a piece and something doesn't work. There is that awkwardness and that silent judgement that goes on. Such a scary thing.

CB: And it's one of those things that at the end of that day it just happened.

JM: One last question, which feels silly because you still have a huge career ahead of you, but what would you describe as your biggest accomplishment so far?

CB: I haven't won any huge awards or anything [laughs]. Composing to me is a really personal thing that I am sharing with people. For me the baritone saxophone and electronics piece, *Life Is,* is my favourite piece that I have written to date. Being able to share that with everybody. And everyone who has heard it has come up to me to tell me was a great piece it was. Being able to share that and have such positive feedback is really exciting. And the piece I am working on now for small ensemble and electronics, with an electronically manipulated harp. I am very excited for that project! I hope it goes really well!

BIBLIOGRAPHY

Armstrong, Victoria. *Technology and the Gendering of Music Education.* Farnham, U.K.: Ashgate, 2011.

Auner, Joseph. *Music in the Twentieth and Twenty-First Centuries.* New York: W.W. Norton and Company, 2013.

Bell, Arthur. "Playboy Interview: Wendy/Walter Carlos." *Playboy* 26, no. 5 (1979): 75-110.

Bernstein, Tamara. "Southam, Ann." *Grove Music Online.* Oxford University Press: 2013. DOI: https://doi.org/10.1093/gmo/9781561592630.article.45467.

Biddiss, Carol. "Composing with the Computer: Is the Technology Gendered?" *Repercussions: Australian Composing Women's Festival and Conference*, edited by Thérèse Radic. Clayton, 108-113. Clayton, Victoria, Australia: National Centre for Australian Studies, 1995.

Borcherding, Carolyn. "Carolyn Borcherding." Accessed November 4, 2019. https://www.carolynborcherding.com.

———. Interview with Justin Massey. October 24, 2019.

Bosma, Hannah. "Gender and Technological Failures in Glitch Music." *Contemporary Music Review* 35, no. 1 (2016): 102-114.

———. "Musical Washing Machines, Composer-Performers, and Other Blurring Boundaries: How Women Make a Difference in Electroacoustic Music." *Intersections: Canadian Journal of Music* 26, no. 2 (2006): 97-117.

Brooks, Andrew. "Glitch/Failure: Constructing a Queer Politics of Listening." *Leonardo Music Journal* 25 (2015): 37–40.

Caputo, Virginia. "Add Technology and Stir: Music, Gender, and Technology in Today's Music Classrooms." *The Quarterly Journal of Music Teaching and Learning* 4, no. 4 (Winter/Spring 1993): 85-90.

Carlos, Wendy. "Wendy's World." By Frank J. Oteri. (January 18, 2007): https://nmbx.newmusicusa.org/wendys-world/.

Clarke, Colin. "Time to Burn: Judith Shatin in Conversation." *Fanfare* (July/August 2014): 188-193.

Dean, Rodger, ed., *The Oxford Handbook of Computer Music*. Oxford; New York: Oxford University Press, 2009.

Ensmenger, Nathan. *The Computer Boys Take Over: Computers, Programmers, and the Politics of Technical Expertise*. Cambridge: The MIT Press, 2010.

Essl, Georg. "On Gender in New Music Interface Technology." *Organised Sound: An International Journal of Music Technology* 8, no. 1 (April 2003): 19-30.

Graham, David. "Musician Ann Southam Leaves $14M to Canadain Women's Foundation." *The Star*, October 25, 2011, https://www.thestar.com/news/gta/2011/10/25/musician_ann_southam_leaves_14m_to_c anadian_womens_foundation.html.

Gramper, David and Pauline Oliveros. "A Performer-Controlled Live Sound-Processing System: New Developments and Implementations of the Expanded Instrument System." *Leonardo Music Journal* 8 (1998): 33-38.

Grigsby, Beverly. "Women Composers of Electronic Music in the United States." In *The Musical Woman,* edited by Judith Lang Zaimont, Catherine Overhauser, and Jane Gottlieb, 151-196. Westport, Conn.: Greenwood Press, 1984.

Hinkle-Turner, Elizabeth. *Women Composers and Music Technology in the United States: Crossing the Line*. Aldershot: Ashgate, 2006.

————. "Women and Music Technology: Pioneers, Precedents and Issues in the United States." *Ogranised Sound: An International Journal of Music Technology* 8, no. 1 (April 2003): 31-47.

Holmes, Thom. *Electronic and Experimental Music.* Oxfordshire, UK: Taylor and Francis Ltd, 2003.

Ivey, Jean Eichelberger. "Composer Jean Eichelberger Ivey: A Conversation with Bruce Duffie." By Bruce Duffie. (February 28, 1987): http://www.bruceduffie.com/ivey.html.

Ivey, Jean Eichelberger, Hannah M. Hyatt, and Daria Semegan. "Women in Music." *Music Educators Journal* 66, no. 1 (September 1979): 7-8.

Jarman-Ivens, Freya. *Queer Voices: Technologies, Vocalities, and the Musical Flaw*. New York: Palgrave Macmillan's Critical Studies in Gender, Sexuality, and Culture, 2011.

Kelly, Jennifer. *In Her Own Words: Conversations with Composers in the United States.* Urbana: University of Illinois Press, 2013.

Landström, Catharina. "Queering Feminist Technology Studies." *Feminist Theory* 8, no. 1 (April 2007): 7-26. DOI: 10.1177/1464700107074193.

Lewis Center for the Arts. "Jess Rowland." Princeton University. Accessed October 23, 2019. https://arts.princeton.edu/people/profiles/jessrowland/.

Lillios, Elainie. "Elainie Lillios." Accessed November 4, 2019. http://elillios.com.

———. Interview with Justin Massey. October 2, 2019.

MacDonald-Dupuis, Natasha. "Meet Wendy Carlos: The Trans Godmother of Electronic Music." *Noisey: Music by Vice,* August 11, 2015. https://www.vice.com/en_us/article/53agdb/meet-wendy-carlos-the-trans-godmother-of-electronic-music.

McCartney, Andra. "Creating Worlds for My Music to Exist: How Women Composers of Electroacoustic Music Make Place for Their Voices." M.A. diss., York University (Canada), 1994.

———. "Creating Worlds for My Music to Exist: Women Composers of Electroacoustic Music in Canada." *International Alliance for Women in Music* 2, no. 2 (June 1996): 16-19.

———. "Inventing Images: Constructing and Contesting Gender in Thinking About Electroacoustic Music." *Leonardo Music Journal* 5 (1995): 57-66.

———. "New Games in the Digital Playground: Women Composers Learning and Teaching Electroacoustic Music." *Feminism and Psychology* 12 (May 2002): 160-167.

McCartney, Andra and Ellen Waterman. "Introduction: In and Out of the Sound Studio." *Intersections* 26, no. 2 (2006): 3-19.

Mockus, Martha. *Oliveros and Lesbian Musicality.* New York: Routledge, 2008.

Oliveros, Pauline and Fred Maus. "A Conversation About Feminism and Music." *Perspectives of New Music* 32, No. 2 (Summer 1994): 174-193.

Oluo, Ijeoma. *So You Want to Talk About Race.* New York: Seal Press, 2018.

Peraino, Judith A. *Listening to the Sirens: Musical Technologies of Queer Identity from Homer to Hedwig.* Berkeley, CA: University of California Press, 2006.

Peyser, Joan, "Can the Mark II Sing 'Happy Birthday'?" *New York Times*, May 3, 1970. https://www.nytimes.com/1970/05/03/archives/can-the-mark-ii-sing-happy-birthday-can-the-mark-ii-sing.html.

Pinch, Tervor and Franck Trocco. *Analag Days: The Invention and Impact of the Moog Synthesizer.* Cambridge: Harvard University Press, 2004.

Redhead, Lauren. "'New Music' as Patriarchal Category." In *Gender, Age and Musical Creativity*, edited by Catherine Haworth and Lisa Colton, 171-183. Farnham, U.K.: Routledge, 2015.

Rodgers, Tara. *Pink Noises: Women on Electronic Music and Sound*. Durham NC: Duke University Press, 2010.

———. "Analog Tara: Pink Noises." Accessed November 4, 2019. http://www.analogtara.net/wp/.

Rowland, Jess. "Flexible Audio Speakers for Composition and Art Practice." *Leonardo Music Journal* 23, no. 1 (December 2013): 33-36.

———. Interview with Justin Massey. October 17, 2019.

———. "Turning Up the Volume: Jess Rowland (Composer, Sound Artist)." By Jessica Griggs. *I Care if You Listen* (July 18, 2018). https://www.icareifyoulisten.com/2018/07/turning-up-the-volume-jess-rowland-composer-sound-artist/.

Scharff, Christina. *Gender, Subjectivity, and Cultural Work: The Classical Music Profession*. New York: Routledge, Taylor & Francis Group, 2018.

Simoni, Mary. "Profiles of Determination." *Computer Music Journal* 22, no. 4 (Winter 1998): 19-28.

Stamper, Chloe A. "Our Bodies, Ourselves, Our Sound Producing Circuits: Feminist Musicology, Access, and Electronic Instrument Design Practices." M.F.A. diss., Mills College, 2015.

Truax, Barry. "Homoeroticism and Electroacoustic Music: Absence and Personal Voice." *Organised Sound* 8, no. 1 (2003): 117-124.

Wang, Ge. "A History of Programming and Music." In *The Cambridge Companion in Electronic Music*, edited by Nick Collins and Julio d'Escriván, 55-86. Cambridge: Cambridge University Press, 2007.

White, Frances. "5 Questions to Frances White (Composer)." By Xenia Pestova. (February 26, 2013): https://www.icareifyoulisten.com/2013/02/5-questions-to-frances-white-composer/.

Wolfe, Paula. "A Studio of One's Own: Music Production, Technology and Gender." *Journal on the Art of Record Production*, no. 7 (2012).

———. *Women in the Studio: Creativity, Control and Gender in Popular Music Sound Production*. New York: Routledge, 2020.

Woloshyn, Alexa. "Electroacoustic Voices: Sounds Queer, and Why it Matters." *Tempo: A Quarterly Review of Modern Music* 71 (April 2017): 68-79.

Woloshyn, Alexa, Robin Elliott, and Sophie Stévance. "Norma Beecroft. 2015. Conversations with Post World War II Pioneers of Electronic Music." *Intersections* 36, no. 1 (2016): 103-05.

Z, Pamela. "A Tool is a Tool." In *Women, Art, and Technology*, edited by Judy Malloy, 348-361. Cambridge, MA: The MIT Press, 2003.