PATHWAYS TO PERFORMANCE: HOW COMMUNICATION TECHNOLOGIES HELP BRIDGE GAPS IN MUSICAL CULTURE

A Thesis and Documentary Film Proposal
Submitted to the Faculty of the
Graduate School of Arts and Sciences
of Georgetown University
in partial fulfillment of the requirements for the
degree of
Master of Arts
in Communication, Culture and Technology

By

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Washington, D.C.
May 23, 2007
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ABSTRACT

This thesis and documentary film proposal explores how cultural definitions of music restrict certain populations from full musical participation and how new communication technologies are helping provide marginalized populations with access to musical expression. Music is a vital human communication form and limiting access from certain people is a social injustice. Innovation in ideology and practices, and the adoption of advanced technologies, help reduce social access barriers to musical participation for all people. This thesis and documentary film proposal examines historical evidence of how marginalized musicians and musical forms together have worked to confront cultural boundaries and enter mainstream disciplined and popular musical culture. Modern technologies help foster musical experimentation and, in a rapidly expanding digital economy, are offering new modes of musical expression to underserved audiences. This thesis proposes that using technology to extend musical practice to new audiences, and loosening social definitions that govern music, will make musical culture more inclusive and socially just than ever before.
ACKNOWLEDGEMENTS

This project could not have been possible without help from many people. I would like to thank Dr. Thomas Mascaro for his valuable insight and mentorship as thesis advisor and Dr. Margaret Rhoades for her guidance as committee member. I also would like to extend my gratitude to the faculty and students of the Communication, Culture and Technology department at Georgetown University for continuing to inspire and drive my work throughout my graduate career. I reserve special thanks for my husband, Karl Jackson, and my family and friends for their loving support, and particularly to my brother, Geoffrey, who inspired this project. My gratitude also goes to all those who participated in and/or assisted with this research, particularly Dr. Elainie Lillios of Bowling Green State University and Mr. Robert Novak of the University of Maryland, College Park.
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CHAPTER I

Introduction

"Through thick and thin, music technology served as America's engine of cultural integration."

—M. Coleman, 2003

Music, Margins and Technology

Public policies concerning the arts often synthesize artistic expression and appreciation through political vision. In this way, arts become embodied in disciplined cultural practices. In honor of Arts Advocacy Day and the 2007 National Arts Action Summit, for instance, United States Secretary of Education Margaret Spellings announced that arts and arts education are a vital part of American life.¹ Spellings acknowledged that for youth, arts participation can "stimulate and enrich learning," encourage "children's imagination and creativity" and help make other academic subjects "more memorable and profound." Echoing former Education Secretary Rod Paige who wrote, "the arts, perhaps more than any other subject, help students to understand themselves and others," Spellings urged state and community leaders to "ensure that the arts remain part of every student's education" (U.S. Department of Education, website, March 22, 2007).

¹Arts Advocacy Day, held annually on March 12-13, is sponsored by the nonprofit organization Americans for the Arts (www.artsusa.org).
community context. While art can exist apart from community settings, education provides a venue to employ resources in building shared cultural practices. For this reason, policy centers like the Department of Education tout arts programs as important for developing "knowledge and skills" and fostering academic and personal achievement (U.S. Department of Education, website, March 22, 2007).

As part of the arts, music is a vital and rewarding component of human experience. A 2002 compendium of research in musical instruction concluded music:

- Positively affects young students' attitudes toward reading and aptitudes in language;
- May contribute to improved math skills, spatial-temporal and abstract reasoning and visual memory, imagery and sequencing;
- Is associated with higher standardized test scores in reading and language; and
- Can benefit students with special needs and those who are delinquent or are disadvantaged.²

Because music saturates culture far beyond the educational setting, cutting across commercial, recreational, spiritual, political, socio-economic, demographic and other social realms, it is inseparable from an enriched public and individual life.

Today, many traditional school band programs in the United States employ technology in the music classroom. According to a 1995 Statistical Analysis Report on arts education in the United States performed by the National Center for Education Statistics, roughly 94 percent of U.S. secondary schools offered instruction in music between 1993 and 1994, with an even higher percentage, 99 percent, in urban and suburban schools. Though the majority of schools reflected having some form of music instruction in their curricula, only 82 percent of school districts provided specific instructional guidelines in music. And although only 38 percent of schools employed arts specialists on the school staff, nearly half reported that they employed instructional and other technologies in the music classroom.

The field of music technology also is expanding. Synthesizers, computers and other communication technologies also have punctuated commercial, or popular, non-formalized musical culture for several decades. These technologies are now offering greater potential for musical engagement at the institutional level. College music programs offer coursework in digital composition and teaching with technology alongside traditional instrumental and theory courses, allowing innovative students and researchers, who are experimenting at the margins of musical culture, to broaden the language and field of formal music.
Actively participating in musical culture is simple for some artists and audiences. Those with interest, talent and physical and economic means can pursue formal training and become active members of the greater musical community. Those lacking the talent, or means to develop skill, can still participate in musical culture by consuming music from recorded media or live performance event. But what happens to populations that lack the interactivity available to others? People with limited physical or social flexibility are restricted from participating in many facets of musical culture, particularly in music-making practices. If musical expression is a known vital cultural form, what does this imply for those limited from participation in musical expression?

Communication technologies are expanding musical participation and opening it to previously restricted populations. Inner-city schools lacking funds for band programs can offer music via a computer lab and software. A school in a remote location might receive musical content via television or the Internet, thus connecting students with the broader musical culture. A hyper-instrument—a high-tech sound-generating machine developed for music-making practices—might allow physically impaired students to generate music through simple movements. These are examples of the potential for communication technologies to expand the musical field.

Musicians with and without formal training are adapting communication technologies to musical settings. Popular music has long featured sampling, or borrowing, of earlier musical forms through technological means. This technique is frequently used in forms such as pop and hip-hop, where music is borrowed and mixed from existing sources, and recreated as new melodies and beats. Both traditional
musicians and non-traditional musicians—those who have not received formal musical training, or who experiment with sound outside the musical canon—use new communication tools and techniques to create new venues for musical expression.

As open as communication technologies can make music, however, a formal musical discipline still defines the mainstream practice of music, and an institutionalized music market conditions how the public engages recorded sound. As long as cultural gatekeepers retain control over musical practice, certain musical forms will continue to be pushed outside mainstream culture. The digital revolution is slowly challenging cultural boundaries, however, and redefining musical communication. And at the margins of mainstream music culture, interesting new technologies may permit new forms of expression and, more importantly, bridge gaps to musical participation facing underserved populations.

Even as music continues to evolve in both sophistication and convenience, certain audiences face significant barriers to access due to biological and social impairments. These underserved populations are barred from musical participation because disciplined thought and practice limit how music is valued, learned, communicated and otherwise engaged:

- An individual with a physical disability, for example, may lack the dexterity to play a traditional brass, woodwind, string or percussion instrument. He or she could express musical art through adaptive computer technologies, but if the generated sound lacks refinement or flouts convention, is it still music?
• An individual with an *attention deficit or learning disorder* may find the rigorous focus on formal musical notation and timing overwhelming. If she employs a synthesizer to sample and edit pre-existing sounds into a new melody, is she a composer?

• An individual from a *low-income population* does not have the financial means to rent or purchase a musical instrument or lessons and uses a found material, such as an overturned steel barrel, to create street music. Is he a musician?

These individuals stand outside the boundaries of dominant musical culture. As they are relegated to the margins, the field of music is limited by narrow or traditional definitions of what constitutes "music." This project uses written and visual documentary methods to explore this aspect of musical culture and to question the boundaries that include and exclude certain individuals from musical participation.

Questions of musical value are difficult to answer. Just as music performance is rooted in the individual, so too is perception. One person's rock and roll is another's noise. Glenn Miller, Frank Sinatra, Nat King Cole and Judy Garland may cause children of World War II to reflect fondly on simpler times. To Baby Boomers, Generation Xers or Millenials, these may be just old-time "songs." Even people who consider themselves open-minded about musical forms have to climb a learning curve to appreciate Laurie Anderson's odd electronic soundscapes, D.J. Spooky's electro-percussive rhythms, Amon Tobin's jazzy syntheses or John Cage's four-and-a-half minutes of silence. But,
whether marginal or mainstream, all music is an acquired taste. Institutions help govern this taste.

Culture, especially examined culture, is easily categorized or institutionalized. Jazz, for example, began as an experimental form that fused Western musical instruments with African American musical practices. Jazz eventually gained momentum and widespread public appeal. Today many college music programs offer jazz studies as a part of the academic discourse. In 2003, President George W. Bush signed U.S. Public Law 108-72, which recognized jazz as "a rare and valuable national American treasure" (United States Department of State, website, 2005). Whereas jazz was once considered a common street art, today it is an institutionally valued artistic form.

As innovators explore and manipulate the margins of conventional cultural practices, those margins bend, move and increase in flexibility until they slowly subsume new forms. As boundaries weaken, expand and re-form, they spur continued cultural evolution and, oftentimes, revolution. History reveals that cultural practices expand and contract until once-novel artistic forms are no longer marginal. When disciplines expand to include new musical forms, musical culture itself expands. This movement often is spurred by agents working to push the boundaries of disciplined thought. In culture and in music, margins can provide a space for collective expression among stakeholders outside the cultural mainstream. The collaborative space of such margins is the focus of this project.
Particularly in the past two decades, communication technologies have pushed the boundaries of culture in many ways. The extension of communication technologies into the musical field is expanding margins for musical experimentation. These margins have the potential of convening different stakeholders in a dialogue about how to extend disciplinary definitions to include new practices and audiences. Communication technologies can help individuals reclaim music as an inherent human expressive form and construct new opportunities for cultural inclusion. If someone were to compare the number of individuals owning a musical instrument with the number of individuals owning a computer, for example, what would be the result? There is no doubt that in Western culture, computers are a mainstream communication technology. If a computer in each household were to be re-envisioned as a tool for musical expression, would not the musical soundscape be dramatically altered?

Researchers working to adapt communication technologies for music and to develop non-traditional grammar for musical expression are confronting musical margins. Some music researchers are introducing everyday communication technologies into classroom settings and teaching students to produce music with non-traditional sound techniques. Others are developing new interfaces that fuse physical movement and creativity with sound generation, freeing music from reliance on rote hand-eye coordination and other sophisticated physical movements. Still others are using communication technologies to capture and rearrange natural, environmental sounds into music that broadens the aural palate. These experimental programs at the margins are diversifying musical culture.
Margins offer a site for collaborative experimentation in music and in broader culture. Once music researchers begin to work in tandem to explore and deconstruct these cultural margins, they can influence new alternatives for dispensing music across different social communities. This research project examines the pathways researchers offer through communication technologies and new forms of musical expression to expand the cultural boundaries of music and foster new policies that make music more inclusive and socially just than ever before.

Pathways to Performance: Employing a Documentary Film Method

The literature on documentary criticism and documentary studies includes a large collection of works on documentary film and video method. (For simplicity, the phrase “documentary film method” will be used regardless of medium.) These include, but are not limited to, classic works by Bluem (1965) and Rosenthal (1971), specialized studies, such as Silverstone’s (1985) *Framing Science: The Making of a BBC Documentary*, and more recent approaches by Hampe (1997), Nichols (2001), Rabiger (2004), Bernard (2007), and Chapman (2007). From these works we can extract the components and synthesize a standard approach based on the accepted phases of production and standards of evidence collection and synthesis.

Furthermore, the goal of this documentary thesis is not to produce the finished program—which involves considerably more development beyond the traditional thesis—but instead to collect and synthesize evidence into a preliminary conclusion to
serve as the foundation for the project funding-proposal stage. This requires a brief note of explanation.

As with any academic research, the conclusion or outcome of a documentary should be based on the evidence collected during the pre-production phase of the project. Grierson (1939), who enjoys a solid standing in all documentary literature, defined documentaries as the “creative treatment of actuality” (Grierson, 1939, as cited in Bluem, 1965). That does not mean, however, that one develops a film in one’s mind then sets out to produce foregone results that make that expression visible. Creative treatment of “actuality” requires first a collection of actual evidence. In short, for documentary purists or traditionalists, the documentary takes shape and comes into view at the end of a long process, rather than at the beginning. This approach also mirrors conventional academic studies: question, evidence and conclusion.

However, there is a “catch 22” involved with documentary proposals. The nature of documentary method is, not unlike ethnography or similar anthropological methods, that discovery is ongoing throughout research, interviews, filming and other parts of evidence collection. Before a final report (script) for the program can be written, the work of collecting, sifting, analyzing and editing the evidence must be completed first. However, many documentary supporters or benefactors, the National Endowment for the Humanities, for example, or senior producers require a preliminary proposal including a treatment and shooting script before they will fund the production phase of the project. It is a classic “catch 22”—no one wants to commit resources to producing a documentary unless they have a reasonable idea of likely success and a
tacit understanding of at least the themes of the final program, if not the actual content. But before one can know the final outcome, the entire process must be completed.

Any gap between what was proposed and what results after actually producing the program will need to be reconciled by the parties involved. But the starting point for “production” is the research and evidence analysis, which takes the form of the proposal and treatment. For the academic documentary, then, the goal is to complete the research with sufficient depth to prepare a fund-raising/budget proposal and treatment and with sufficient rigor to equate to a traditional textual thesis.

**Phases of Production**

Most of the above works separate documentary method into three standard phases: *preproduction, production* and *postproduction*. For the purpose of this thesis, the method focuses on the preproduction phase: forming the research question, reviewing the literature, refining the question, collecting evidence and formulating a conclusion. This involves research, qualitative interviews and collection of visual evidence to explore the ways in which individuals employing communication technologies and experimental methods at the margins of musical culture are helping to bridge gaps in participation for underserved audiences. The intent for the thesis phase of this project is to develop a documentary shooting script, which will lead to the eventual production of a documentary feature.

Preproduction "is crucial to the success of a documentary" (Hampe 1997, p. 93). In the preproduction phase of research, the documentarian identifies a film concept and
begins preparation of a documentary treatment, outline and script. Preproduction involves defining the research field, selecting interview subjects and determining a unit of analysis. It also requires developing an interview questionnaire and methodology to be employed in the field. This project employs an open interview method, in which a structured research questionnaire guides the focus of the interview without interfering with the natural setting and subjects' spontaneous responses. The open-ended interview method is structured to allow interviews to proceed organically and for the documentarian to collect both aural and visual evidence to construct the film's narrative analysis.

In pre-production, structuring the documentary method and writing the shooting script employs two dominant approaches to documentary filmmaking, presented by Hampe as "anthropological—showing people, institutions, and cultures as they are, or at least as they seem, when a camera is pointed on them" and "historical—trying to bring to life on film or video significant people and events from the past" (p. 27). Employing both anthropological and historical documentary method, this project uses qualitative interviews that help identify the interview subjects' "attitudes and behaviors" as "best understood within their natural setting, as opposed to the somewhat artificial settings of experiments and surveys" (Babbie, 2007, p. 287). It also analyzes historical records for patterns within the research field that can be connected with the field research to build the film's narrative analysis.

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3 Hampe, et al., also includes scouting, budgeting, casting, scheduling, developing a crew, deciding on documentary format, and collecting equipment and supplies as part of the filmic process (pp. 95-96). This overview of methodology is concerned with preproduction as it relates to preparing for field research.
For the preproduction phase—to create a documentary proposal, treatment, shooting script and begin to conceptualize visual and aural evidence—qualitative interviews are the best way to capture and reflect the practices, episodes, encounters, roles, relationships, groups, organizations, settlements, social worlds, lifestyles or subcultures that exist within the research field. It is important to note that documentary method can be confused with—and is not—simply journalism. Babbie explains, "social scientists and journalists may use similar techniques, but they have quite a different relationship to data" (p. 288). This method goes beyond "simply reporting about a subject's attitude, belief, or experience" and focuses on capturing "data that need to be analyzed to understand social life more generally" (Babbie, p. 289). The documentary research method involves several key components:

- Prepare the research question, collect preliminary research and construct the research instrument;
- Refine the question and conduct historical and qualitative field research;
- Examine and analyze data;
- Prepare documentary proposal, treatment and shooting script.

These steps connect the field and historical research with an analytical method that requires examining and synthesizing data into a documentary shooting script and eventual final film. Though the method will help produce an objective and thorough narrative, there are several considerations when working in the anthropological and historical documentary film method.

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4 Babbie lists the above "several elements of social life appropriate to field research" to help field researchers to understand how qualitative interviews can function in social research (p. 287).
Employing the anthropological documentary film method, this project gathers first-person accounts through qualitative interviews with subjects from across the research field. Subjects respond to a variety of questions regarding musical culture, communication technologies and marginalized audiences. Hampe cautions against viewing documentary method as a means of gathering responses with absolute truth values (p. 65). Anthropological documentary method requires regular review of the interview process to maintain ongoing validity in presenting aural and visual evidence.

Documentary method is open to bias in the information gathering and data processing stages, so regular analysis of technique and method can help mitigate predisposition toward mistakes in representation. While interview responses are subject to bias, the documentary method assumes forms of reality always are constructed across human social interaction. There are many possibilities for influencing subjects' "reactivity," which Babbie describes as "the problem that the subjects of social research may react to the fact of being studied, thus altering their behavior from what it would have been normally" (p. 290). The presence of the researcher, the method of questioning and other external factors can influence subject responses.

Additionally, whether the documentarian takes an "emic perspective" by "taking the point of view of those studies" or an "etic perspective" by keeping "a distance from the native point of view in the interest of achieving more objectivity" also has the potential of altering subject responses (Babbie, p. 291-292). Babbie advises qualitative researchers to focus on rigorous preparation before entering the field; to employ active listening techniques in conducting field interviews and record field observations as
accurately as possible; and to review the process for threats to reliability and validity throughout the course of the project. Additionally, the documentary method requires working to accurately synthesize proposed visual and captured aural materials into the film's shooting script.

Documentary method requires the researcher to decide, in pre-production, how best to structure and manage the filming process in order to capture and represent the data as accurately as possible. Aesthetic judgments must be made prior to entering the field to ensure the documentary data are not manipulated or corrupted by subjectivity and other threats to validity.

Nichols (2001) notes each documentary finds "its own distinct voice" and like "every speaking voice, every cinematic voice has a style or 'grain' all its own that acts like a signature of fingerprint" (p. 99). Nichols notes modes of representation affect the ways in which documentary evidence are presented and identifies six primary modes of representation as: poetic, expository, observational, participatory, reflexive and performative (pp. 99-138). The documentary method must be aware of the ways narrative voice can shape documentary film and determine the best method to approach representation of evidence.

The poetic documentary method tends to present abstract visual and aural narrative to turn the film's focus to the "associations and patterns" with culture, rather than delivering a more objective sense of visual and aural evidence (Nichols, pp. 102-105). This documentary method seeks to avoid the poetic mode, which lends the

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5 Taken from chapter ten of Babbie, which discusses practices and methods of qualitative field research in the social sciences (p. 286-317).
filmmaker a subjective voice. The expository documentary method tends to focus on history, assembling "fragments of the historical world into a more rhetorical or argumentative frame than an aesthetic or poetic one" addressing "the viewer directly, with titles or voices that propose a perspective, advance an argument or recount history" (Nichols, pp. 105-109).

This documentary also employs some expository methods in representing historical evidence from the research field. The observational documentary method captures evidence as it happens, enabling the researcher to gather the "necessary raw materials" and build "a meditation, a perspective, or argument" from them (Nichols, pp. 109-115). This documentary method employs many observational techniques in capturing visual evidence but departs from observation for the recorded field interview. The participatory documentary method is close to the participant-observation social scientific field method in that the filmmaker enters the field, enabling the film to "stress the actual, lived encounter between filmmaker and subject" (Nichols, pp. 115-123). The role of the filmmaker is active in this method and the film "gives a sense of what it is like for the filmmaker to be in a given situation and how the situation alters as a result" (Nichols, p. 116). This documentary avoids the participatory method and instead attempts to reduce the researcher's influence on the field, so the captured evidence is as objective as possible. The qualitative interviews, however, require certain engagement with the participatory method for the capture of qualitative evidence. Both the reflexive and performative documentary methods emphasize form and subjectivity within post-production of the film, and manipulate style and aesthetics to comment on the film itself.
as well as the film's subjects (Nichols, pp. 125-137). This documentary method avoids both reflexive and participatory modes in order to represent evidence as accurately as possible and eliminate researcher bias from entering the film.

The documentary method provides a rich, qualitative exploration of the research field. It is critical to approach the film method with rigorous attention to eliminating subjectivity and bias from the process, and with the intent of capturing evidence to accurately represent the research field. Close attention to weaknesses in research practices helps reduce problems validity in the documentary method.
CHAPTER II

Part I: Boundaries

Cultural boundaries are socially constructed. To Bhabha (1993), "the semblance and similitude of the symbols across diverse cultural experiences – literature, art, music, ritual, life, death – and the social specificity of each of these productions of meanings … circulate as signs within specific contextual locations and social systems of value" (p. 191). In other words, shared values and value systems govern social practices across most cultural fields. Cultural value systems are not static and boundaries evolve. West (1993) argues cultural agents often attempt to "undermine the prevailing disciplinary divisions of labour in the academy, museum, mass media, and gallery networks," for example, by working to "trash the monolithic and homogenous in the name of diversity" (p. 257). Thus, cultural margins become sites for exploring "the tension between cultural homogenization and cultural heterogenization" that exist across society (Appadurai, 1993, p. 221).

In musical culture, margins foster continued exploration and evolution. Individuals excluded from mainstream musical culture often work to extend musical boundaries and create new opportunities for musical expression. This chapter explores the concepts of cultural "margins" and how margins become sites for individuals to apply existing techniques and technologies in innovative ways, creating novel cultural forms. History shows that occasionally these forms seep into the cultural mainstream and expand musical culture. Because neither culture nor margins are static, marginal
forms always have the potential of entering the mainstream. Thus, change is always on the horizon.

While many musical administrators are conscious of how history and rhetoric can condition musical life, others are not. Woodford (2005) explains, "regrettably, music teachers long ago abandoned, or were abandoned by, the public sphere, retreating into the relative isolation of their profession while losing touch with the wider political ideals and movements that once inspired them" (p. 57). In essence, "many contemporary music teachers ... consider democracy to be potentially dangerous to practice in that it can undermine their authority while contributing to the degradation of musical and other standards" (p. 58). But oftentimes, standards are flawed. Elliott (1995) argues "some teachers and administrators base their decisions about music curricula on the false assumption that music making is possible and appropriate only for special students; namely, the so-called talented" (p. 235). "Perpetuating the myth of music-as-talent" marginalizes many musical forms and places it "beyond the reach" of most people (p. 235).

Gatekeepers who understand how musical tastes and practices are socially constructed can build inclusive policies for marginalized audiences. Woodford explains "music teachers are probably uniquely positioned to help break down or bridge institutional, social, and cultural barriers to the free exchange and cross-fertilization of ideas in the public sphere through their use of an increasing diversity of music in the classroom" (p. 77). One way musical gatekeepers can extend cultural boundaries is adopting marginal music forms into disciplined music. Woodford notes this can be
accomplished by going "beyond traditional concert and jazz bands, orchestras, and choirs to offer alternative groups and ensembles that might be more attractive to the general population (e.g., percussion, folk, and world music ensembles, rock and popular music groups of various kinds, glee clubs, and community sing alongs)" (p. 89). By broadening the musical discipline, administrators open new opportunities for musical engagement to audiences across diverse social contexts. A collaborative and interdisciplinary focus on musical culture offers gatekeepers a guide for spotting and combating social barriers that exist within musical culture.

Music in Everyday Life

Music is a vital part of everyday life. Across history and particularly in modern times, music serenades the social experience. Green (2003) contends a "society without music has never been discovered" (p. 263). In Western culture, music bleeds into the public sphere, into schools and shopping malls, cars, offices, churches, fitness centers, social clubs, hospitals, elevators, airports, restaurants and movie theaters. Frith (2003) states in the twenty-first century "it's not just that music is everywhere but that all music is everywhere" (p. 95). Whereas once music was connected with occasion and tradition, Frith insists that today's musical sounds saturate all facets of public and private life, with no "necessary connection between the occasion for making music and the occasion of listening to it" (p. 95). Thus, in public space, music is largely ambient, conditioning the social experience with a detached and cluttered symphony of sound.
Music has different applications to different audiences. For some, musical practice follows from historical traditions linked to early social constructs. As chapter two will explore, early American music was highly exclusive. Though by the early twentieth century, many American music administrators had adjusted their practices to meet "society's immediate utilitarian and aesthetic needs with respect to socializing immigrants, developing community outreach programs, and promoting good citizenship," they failed to develop programs that would truly "transform musical society" (Woodford, p. 12). Even in modern times, music administrators still "defer to the authority of tradition and the professional status quo" in governing musical programs (Woodford, p. 13).

Disciplined music is one narrow facet of musical culture. Many others practice music outside formal settings—in what often is considered the margins of musical culture. Green (2001) notes, "the opposition between 'disciplined study' related to classical music, and 'osmosis' related to popular music, suggests a broader split between 'culture' and 'nature'" (p. 99). In other words, disciplined music has form and function while extracurricular musical is just unbridled expression. "Whereas culture is implicitly linked with that is worthwhile and ethical, nature is associated with inevitability and therefore amorality" (Green, p. 99). Discipline often constructs independent music as diametrically opposed to formal music. But can't independent music be rigorously studied and pursued?

The introduction explored how musical values are hard to define. Woodford suggested music administrators move beyond traditional band and jazz ensembles and
adopt new forms. Just as visual art evolved through movements such as impressionism, Dadaism and cubism, music has experienced artistic evolution. Repertoire from the baroque, classical, romantic and modern eras each evolved unique characteristics; modern popular music such as rock and roll, hip-hop and punk also are distinct musical forms. Each diverse musical genre—mainstream and marginal—has a unique application within the greater musical culture.

Today, music is also a massive commercial industry that encompasses many diverse forms. The American consumable media market earned roughly $400 billion in 2005\(^6\) and the total retail value of physical and digital music alone was more than $12 billion\(^7\)—representing one-third of the world's recorded music market.\(^8\) Digital music alone accounted for roughly $500 million in revenue in 2005\(^9\) and is a market that continues to grow. Commercial music today is an expansive and expanding field.

In addition to being an art and a consumer product, music also is a social tool. It is common to find music in settings that are religious, recreational, therapeutic, academic, civic or political, for example. As chapter two will discuss, secular and church music have been an active part of American history since its early history.

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\(^6\) The U.S. Census Bureau classifies communication industries as the following: advertising, specialty media and marketing services; broadcast, cable and satellite television; radio; entertainment media; consumer internet services; newspaper, consumer book and magazine publishing; business-to-business communications and business information services; and professional, educational and training media. Television alone earned roughly $86 billion, with recorded entertainment earning an estimated $54 billion.
Woodford and Elliot illustrated how disciplined music evolved practices and languages through which communities of students and educators built common cultures. Green observes that throughout history, "music education has been a central mechanism in the establishment and maintenance of the classical canon," particularly across Western cultures (p. 267). In cultural practice, music can foster connection and breed inequality. Bohlman (2003) argues discipline and, thus, "domination" of music emerges when "culture allows for the domestication and possession of music" (p.52). Evoked as a cultural tool, music "is well fitted to do cultural work" resulting in its demise as a purely aesthetic expression or artifact (Bohlman, p. 55). Modern music can be produced, consumed, appreciated, critiqued, studied, re-invented, challenged or traded. It is difficult to escape the omnipresence of musical culture—even a person with no desire for musical interaction will find music imposed within most public spaces. Music is engrained in social structures and human behavioral patterns that constitute culture.

Humans use music in different ways. DeNora (2000) attributes human connection with music both with a need for self-identification and for social connection. As a "technology of the self," music carries myriad cultural connotations for both the individual and the community (pp. 48-49). Musical ritual impacts psychological, physical and social behavior in a way that "is not about life but is rather implicated in the formulation of life; it is something that gets into action, something that is a formative, albeit often unrecognized, resource of social agency" (DeNora, pp. 151-152). Because humans often use music to fill individual and social needs, participation in music represents a basic human freedom—a form of individual and social agency. What
a person can accomplish as a listener and practitioner of music is up to his or her skill and motivation. Likewise, the ways in which mass culture engages music daily speaks volumes to the impact of music on one's physical and psychological vitality.

Bohlman suggested, however, that musical culture is not wholly equitable. As in most public arenas, Western society has built cultural patterns around musical language and communication that influences—and sometimes limits—how individuals can engage with music. Small (1998) argues music extends beyond the connection between performance and sound to the social construction of musical culture:

… the way people relate to one another as they [perform] music is linked not only with the sound relationships that are created by the performers, not only with the participants' relation to one another, but also with the participants' relationship to the world outside the performance space, in a complex spiral of relationships, and it is those relationships, and the relationships between relationships, that are the meaning of the performance (pp. 47-48).

Social codes govern musical culture as they do all culture; thus, modern musical culture is structured so completely that it forms a functional social institution through which and by which dominant musical practices are formed and perpetuated. Musical structures differ across different cultures. In Western culture, music gatekeepers govern how music is produced and circulated. Copyright law protects musical property so individuals must provide financial compensation for access to another's musical work. To actively participate in disciplined music education and performance, most individuals require some form of financial ability and physical and social fitness. In
many cases, music is restricted from certain populations by various socio-economic or demographic means.

For DeNora, the social ordering of music is a "means of organizing potentially disparate individuals such that their actions may appear to be intersubjective, mutually oriented, co-ordinated, entrained and aligned" (p. 109). Just as cultural patterns dominate public life, they condition the ways in which individuals and communities engage with music. Some individuals are enfranchised in Western musical culture, and others are not. Yet almost all humans have the basic capacity to transcribe external sounds, or sound vibrations, into physiological responses. DeNora describes the base human response to music as a process of embodiment and empowerment. Music holds specific connotations for the individual and also conditions an individual's behavioral responses through elements such as pace, rhythm and tone. Music goes beyond connecting human movement with sound, DeNora argues that music provides "a ground or medium within which to be a body" so that bodies "not only feel empowered" to movement, but "they may be empowered in the sense of gaining a capacity" (pp. 123-124).

This evocative power of music is evident in musical ritual. Finnegan (2003) offers "rituals are often intershot with music, managing fraught occasions in human lives and presenting organized occasions for emotional deployment where, again, it makes no sense to draw an opposition between thought and feeling" (p. 186). Music has power over the individual; in practice, music can "marshal a sense of communitas, of trance, or of transformation from one state to another" (Finnegan, p. 186). If music is
empowering, shouldn't all humans have equal right to full participation? And if full participation requires rapidly and completely re-envisioning dominant discourses in music and present social approaches to musical administration, shouldn't musical gatekeepers lead the foray?

As a vital and expressive universal language that inspires internal emotion, external action, individual empowerment and social connectivity, music is rooted in individual and cultural agency—regardless of a person's social or biological fitness. For culture to exclude a particular audience from musical engagement, then, would it not open important questions about or policy implications concerning social justice? Straus (2006) argues such cultural patterns are rooted in history—both in rhetoric and action. Fundamental "concepts of normal and abnormal are deeply familiar" and humans are "well habituated to sorting things out into those categories, of identifying certain practices as constituting a norm, as normative, and others as abnormal or deviant, as statistical outliers" (p. 131). Moreover, "habituation to these terms and concepts has tended to conceal their history," limiting social ability to recognize where such prejudicial ideology dominates behavior (p. 131). Straus says not only does society marginalize different populations; it does so even in cultural arenas such as music. While Straus refers particularly to cases of physical and mental disability in musical participation, his research provides a valuable model for bridging social barriers through inclusive policies for all marginalized audiences. If inclusion means opening cultural boundaries to new methods and audiences, how can musical gatekeepers define certain individuals and groups according to prescriptive social boundaries? To expand musical
culture is to abandon such social constructions in favor of inclusive approaches and policies. In other words, broaden cultural definitions to include more people and practices.

Western social policies continue to recognize cultural and individual values of music through ongoing funding, education and other strategic and administrative programs "interested in innovative presentation methods" and helping "organizations attract new audiences for music" (National Endowment for the Arts, website, March 24, 2007). These policies and practices are incomplete in that they do not always recognize social access barriers that limit certain audiences from full participation in musical culture, or cultural ideologies that exclude certain people. Not every sheet music publisher, for example, offers musical products inclusive of musicians with biological or social impairments. One prominent music publisher provides sheet music downloads, music history books and even free online ringtones on its website, for example, but has no content geared toward musicians with special physical needs. As long as the social construction and cultural administration of music is narrowly defined, social barriers will remain.

How can gatekeepers and stakeholders avoid cultural approaches to inclusion that stigmatize or marginalize individuals as disabled, disadvantaged, delinquent or any other generalized notion of "other"? Straus cautions that qualifying underserved musicians as "uniform or immutable" in terms of a generalized view of biological and/or social impairment only serves to strip their individualities in favor of organizing
them in a reifying frame of "disability" (p. 113-115). One way to build inclusive policies is to involve diverse stakeholders in the musical discourse.

Some research emerging in experimental and technology-aided music attempts to bridge such inequalities and create musical solutions that address the personal needs of diverse individuals; these socially just practices at the margins of musical culture have the promise of providing underserved audiences with pathways to participation.

Part II: Margins

Before exploring approaches to cultural inclusion that can bridge gaps in musical culture, it is valuable to explore the greater role of margins in culture. Margins are common across society. They provide a site for excluded people to convene and create a common dialogue. In late 1970s Western culture, for example, punk-rock was a site for musicians to experiment with new forms of sound manipulation using new technologies and techniques discovered mid-century. The early British punk group Cabaret Voltaire "took sound itself as an inspiration and, casting themselves in the role of media terrorists, created a catalogue of wonderful electronic and live sounds in movement" (Prendergast, 2000, p. 314). But punk did not emerge in a vacuum. Prendergast illustrates how an experimental movement driving artists across the cultural arts—literature, music, visual art, film and more—inspired punk's eclectic collage of sound (pp. 314-315, 317, 320-322). Prendergast's connection between margins and broader artistic movements is evident throughout history. Musician John Cage was widely known for his collaborations with artist Robert Rauschenberg and dancer Merce
Cunningham, for example (Prendergast, pp. 44-49). Pop artist Andy Warhol was known for his role in managing The Velvet Underground and for his interactions with countless film artists (Prendergast, pp. 208-212). Margins often crosscut the cultural arts to create shared, interdisciplinary dialogues that sometimes extend into mainstream culture. Marginal genres, particularly in music, often are situated within broader historical contexts and technological revolution. An exploration of margins helps understand their role as sites for creative experimentation, and where better to begin a study of "margins" than with the history of books?

In literary culture, margins are a fundamental element of printed texts. In most books across Western print culture, margins frame pages of text. These units of negative space appear across most print communication tools. In word processing software, for example, margins are built directly into the technology. Margins are an essential part of the non-literary context of books, which McGann (2002) describes as the "bibliographic code" of books—the non-conceptual elements of books that include binding, layout, design, materials, production and circulation channels and more (pp. 39-46). As part of the Western literary experience, readers routinely use margins to enter personal commentary about texts, particularly in academic settings. In print culture, margins are an obvious, but often unnoticed, part of the social practice of reading. In books, margins frame a primary text. In culture, margins frame an influential discourse.

The margins of this text are roughly one-and-one-third inches. Jackson (2001) notes margins and marginal notation descend directly from literary practices that pre-date the rise of print culture in the mid-fifteenth century:
The marginalia we see and write today are in direct line of descent from those of two thousand years ago. Indeed the custom may be as old as script itself, for readers have to interpret writing, and note follows text as thunder follows lightening. Over the centuries, of course, technological and social developments lead to modifications in the practice of annotation ... (p. 44)

According to Jackson, printed margins followed social practices of engaging with and through written language via manuscript notation found as far back as scribal culture. Although margins were an important locus for personal communication even in early print culture, Jackson notes the nature of marginal notation was not static; instead, it changed as book culture evolved (p. 44-50). Early margins were employed for refining texts, but Jackson chronicles how, as books became available and were adopted for individual ownership, margins eventually evolved into vital sites for personal expression and social interaction. Change emerged between an "era in which books, being scarce, were revered and one in which, being comparatively plentiful, they were abused; one in which reading was a social and responsible activity as opposed to one in which it became solitary and self-indulgent" (Jackson, p. 50). In other words, as books increased in accessibility and popularity as a consumable media, marginalia changed from conservative, mostly scholarly, commentary to a means of frequent and open individual expression. Jackson argues that personal and social motives for marginalia are diverse. Marginal notation "can be used to construct and to monitor identity" in ways that exhibit "varying degrees of self-consciousness about the unknown prospective reader," the author writes (pp. 91-96). Jackson also contends that margins
historically have been adapted for social uses. History provides ample evidence of readers—from literary scholars to lovers—using margins for inter-subjective commentary (pp. 56-80). According to Jackson, this social pattern was directly enabled by the rise of the book as a dominant communication form.

Many scholars have aligned the rise of print technology with radical changes in social and cultural organization. Eisenstein (1983) notes "the cultural metamorphosis produced by printing was really much more complicated than any single formula can possibly express" and "efforts to summarize changes wrought by printing in any one statement or neat formula are likely to lead us astray" (pp. 36-38). Jackson illustrates one way in which the evolution of books as a public communication tool fostered changed attitudes toward and practices in personal and social expression.

Just as literary margins emerged out of social need for connection around and through written expression, musical margins evolve out of a similar need for connection around musical expression. In the fifteenth century and those that followed, print was a new technology that enabled society to conceptualize and employ older communication patterns in new ways. As print technology changed reading and writing culture, individual engagement with marginalia moved out of formal settings and into public life. In music, margins also facilitate the movement of musical expression out of traditional settings and into public life; and new communication technologies catalyze new forms of musical expression. The punk-rock movement involved many individuals from across diverse cultural settings, and drew from influences across genres such as musique concrète—a French tradition that used recording technologies to capture and
edit environmental sounds into musical compositions—and rock and roll. Without
electronic musical technologies, punk-rock might not have emerged. Thus, just as the
advent of print communication broadened written expression, digital communication
technologies have helped broaden musical expression. T. Taylor (2001) notes that in
music, technology helps "people do what they always have done: communicate, create,
labor, remember, experience pleasure, and, of course, make and listen to music" in
diverse ways (p. 206). In essence, technologies are opening margins so individuals can
personalize musical expression and expand cultural boundaries, just as early print
technologies altered the way readers employed margins as sites for individualized
expression with and through texts.

Music and Diversity

How does one define musical margins? After two decades, for example, can
punk music still be considered marginal? Perhaps some punk remains marginal to some
audiences, while to others it does not. What about formalized or accepted music—is it
ever marginal and, if yes, how does it become so? What about once-marginal forms,
such as jazz, which are now mainstream? Because cultural boundaries are largely
ideological, it is difficult to demarcate the edge of mainstream from the beginning of a
margin. Yet, the intersection of mainstream and margin is an important site for
confronting cultural boundaries. Culture is dynamic, so its boundaries are always in flux
and open to expansion. Seeking ways to extend musical culture at the margins requires
understanding how those margins are constructed.
Thus far, this chapter has explored how music is everywhere and has value to everyone. It has examined how margins are constructed and how people engage with mainstream and marginal music in different ways and for different purposes. Now it turns to an examination of the construction of cultural boundaries in the music field: If disciplined and formal music informs perception, is individual agency in musical expression wholly free?

Modern society favors ideological and linguistic organization, particularly where cultural boundaries are obscured or complicated. M. Taylor (2001) notes analyzing this organization—in other words, engaging structuralism—"can in a certain sense be understood as an archaeological investigation devoted to stripping away layer after layer of superficial differences to uncover the foundational structures constituting the common origin of diverse natural, social and cultural phenomena" (p. 55). Pursuing knowledge of social archaeology is limiting, however, particularly in a culture where innovation is constantly reshaping public life and increasing its complexity. In the same way M. Taylor notes "the violence of structuralism results from its persistent effort to reduce difference and repress otherness," analyzing cultural boundaries means concurrently legitimizing the social disparities they create in the present and attempting to build future solutions based on those inequities (p. 62).

In musical culture, trying to recognize and remedy programs and policies that exclude underserved audiences from musical participation oftentimes begins by evoking definitions and limitations produced within that same culture. Bohlman recognizes social disjuncture is widespread across musical culture, noting "disjuncture itself is one
of the historically most critical reasons to study music and culture" (p. 46). Bohlman observes that "music and culture are related" and "many theories and aesthetics of music" fail to recognize the connection (p. 46). He argues one reason for the failure "results from a paradoxical unwillingness to admit to the full range of cultural work that music accomplishes" and concludes that, although it is not always recognized, the pattern of disjuncture in musical culture is historically evident (p. 46).

Bohlman's illustration of disjuncture works in practice, particularly in the case of Western music education. To include a student with cerebral palsy in a traditional high school music program, for example, means to fit that student with his or her physical impairment into the pre-existing constructs of the band or choral classroom. Ramps may be added to allow wheelchair access, computers may be introduced to enable the student to interact with musical materials and other students and recitals may be organized to include the student in the on-stage performance. But the student's musical experience is seated in the pre-existing structures of the band classroom, which most often remain intact. The student's impairment is scrutinized, calculated and addressed while the social framework of the band classroom is not. Bohlman would recognize this as disjuncture.

Whether this is the wrong or right way to approach inclusion is not the question; certainly many schools have made great strides in building inclusive practices and policies in the music classroom and have been recognized and commended for doing so. Rather, the correct question is how does disjuncture impact the individual's right to full musical participation? If music is known to be a vital part of the human experience and of personal development, can a musical discipline whose boundaries presuppose certain
physical and social conditions ever be fair to individuals with varying degrees of biological and social capacity?

In Western musical culture, disciplinary practice was fashioned around pre-existing social disparities. As chapter two will explore, before the American civil rights movement, African Americans across diverse communities originally were excluded from all arenas of mainstream culture, including music, and thus were forced to experiment with musical expression at the margins of white society. Racism is embodied in the Western musical experience, Bohlman argues, citing "even as ethnomusicologists at the end of the twentieth century increasingly questioned the reliance on racialized and racist stereotypes in the study of the music of Africa and the African diaspora, there remained resistance to abandoning biological and natural explanations for music's distinctiveness" (p. 50). Out of the race disjuncture in American musical culture, however, was born revolutionary musical forms such as jazz, soul and hip-hop. Though disjuncture may impair musical expressivity and relegate certain traditions to the margins, it cannot fully rob the individual of his or her musical freedom. When marginalized individuals and groups use creative freedom to express new musical forms, culture expands. Music is freed from cultural limitations and marginalized individuals and groups reclaim agency.

What one person deems a musical sound, however, another may say is not a creative musical expression. So, changing musical discourse is a greater challenge. Western forms of disciplined music have been formalized through a history of gatekeeping. School curricula, standard performance repertoire, music funding and
outreach initiatives, instrument and sheet music manufacturing, music consortia and conventions and other social discourses and policies surrounding music, for example, together construct dense boundaries that designate the margins and mainstream of musical practice.

Policies may foster individual and group behavioral changes to reduce inequity, but systemic imbalances are harder to overcome. In the case of the inclusive band room, steps may be taken to increase access and equality, but the foundation of the musical discipline is rooted in historical practices that trace back to eras where cultural inequality was widespread. As Bohlman noted, where definitions of "otherness" remain culturally intact, progress only opens new problems and barriers to access. One solution to building an inclusive culture is to step outside cultural boundaries, deconstruct the definitions and limitations they uphold and try to create neutral programs and policies that minister to the public interest, in general, and underserved populations, in particular. While this notion is ideologically sound, however, nothing in culture is truly value-free, public interest is a clouded concept and an underserved populace—though it may evolve and change to include and exclude certain audiences—remains underserved.

In musical culture, and in greater society, individuals denied access to certain social rights commonly are wrapped into classifications such as "disabled" or "disadvantaged" in order to provide policy makers with an ideological springboard for building concrete procedures and practices. L. Coleman (1997) notes the "infinite variety of human attributes suggests that what is undesired or stigmatized is heavily
dependent on the social context and to some extent arbitrarily defined" (pp. 217). The term disability can encompass any number of individuals with varying degrees of biological impairment or, in other words, varying physical or mental abilities. A young adult with mild cerebral palsy could be classified as disabled alongside a recent war veteran who has undergone an amputation, a child with severe autism or an elderly person who has suffered a stroke. It is clear that these individuals, and other countless individuals living with varying physical and mental abilities, may have little in common other than their social categorization as disabled. Thus, having a disability means lacking a certain ability that has been socially constituted as normal.

Straus identifies social categorization of disability as "culturally stigmatized bodily difference," noting "the construction of disability involves the opposition of a normative standard" (p. 119). According to L. Coleman, this stigmatization is "a powerful and pernicious social tool" fueled by "power, social influence, and social control" (pp. 218-219). One way to overcome limiting classifications is to consider individuals as owners of differing degrees of ability. In their research of new musical instruments and expressive movement, Fels, Gadd and Mulder (2003) approach assessing individual musical ability in terms of devising ways of "mapping"—with the intent of constructing new musical devices—to determine how an individual's various "control gestures translate into sound output" (pp. 5-8). In other words, researchers are working to construct new musical interfaces that can fit an individual's specific capacity for motion and, thus, open musical expression to new or excluded audiences. Likewise, many of these non-notation-based new musical instruments open performance
opportunities to musicians outside the mainstream musical language by focusing on music expression rather than strict music literacy. When physical and social ability, rather than impairment, becomes the canvas upon which to construct new musical tools, those tools have the potential of opening musical expression to broader audiences and stakeholders.

Toward a Working Definition of “Disability”

Cultural definitions of varying social and biological capacities must be somewhat constructed for social administrators to build targeted programs and policies. Alder (1991) studied policy implications in defining disability for the United States Department of Health and Human Services, for example, and found disability to be "notoriously difficult to define," with widely varying definitions that make systematic approaches to disability policy guidance difficult. Alder illustrated the complexity of conceptualizing disability in research, public understanding and policy, writing:

Two major conceptual frameworks of disability are widely accepted (and criticized) within the research community. … Each model has four distinct concepts or stages. These are disease, impairment, disability, and handicap for the ICIDH model and pathology, impairment, functional limitation, and disability for the Nagi model … Problems in defining disability are exacerbated, because these concepts or stages (i.e. disability and handicap) are often interchanged. … Functional definitions of disability are commonly accepted measures of disability for the entire population. Broad overall functions fall into
socially defined categories, which vary by age, gender, class, and culture. …
(U.S. Department of Health and Human Services, website, March 24, 2007).

These few examples nominally represent how constructs of disability differ across "medical, sociological, epidemiological, rehabilitative, vocational, and educational" settings—oftentimes to the point of contention (U.S. Department of Health and Human Services, website, March 24, 2007). From the above example alone, it is clear how difficult it is to construct fully inclusive and socially just programs when definitions of the intended stakeholders are vague or contested. In the arts, federal policy approaches to disability are equally complex. In addition to providing an Accessibility Planning and Resource Guide for Cultural Administrators on its website, the National Endowment for the Arts, through its Office for AccessAbility, supports inclusive arts by:

- providing technical assistance to individuals and organizations … initiating cooperative projects with other federal agencies and nonprofit groups to better educate professionals serving older and disabled people … encouraging and assisting more support for addressing the needs of older and disabled Americans through the Endowment's divisions and through state and national groups concerned with the arts and with underserved populations … assisting applicants and grantees with project development that involve the targeted groups … and organizing/convening panels, seminars, and workshops for Endowment staff, its grantees, as well as other federal agencies (National Endowment for the Arts, website, March 24, 2007).
This example extends the functional definition of disability across myriad programs and to people from many diverse backgrounds. But how well can a policy serve individual or group stakeholders if its primary goals are so imprecise? One answer is to engage stakeholders in the development of such policies and approaches. Green notes, for example, "music education participates in the construction and perpetuation of ideologies about musical value" (p. 265). Thus, engaging diverse stakeholders in constructing those values opens musical culture to new possibilities. Another important step in policy-making is regulating and steering popular consensus to adopt inclusive beliefs and practices. Green argues "just as ideology is reproduced through education, so too are social groups" and that social barriers are constructed "both at the broad social level in terms of cultural and economic relations between social groups, and at the level of the individual in terms of personal identity" (p. 267). Locating and deconstructing these social barriers can help diversify musical culture.

As indicated earlier, whereas behavior is easily modified, systemic change is difficult. Federal policies have a responsibility to the public interest, for example, and work to regulate public behavior where popular ideology may foster injustice. The civil rights movement represents one significant milestone in this ongoing cultural process. Social interests oftentimes conflict with public interests, however. Hahn (1997) examines employment bias toward physical impairment in the private sector, proposing that an "examination of disability and the industrial system indicates that the unemployment rate of disabled adults may be traced to broad economic forces rather than to individual impairments" and while some may view "legal efforts to end job bias"
as sufficient, there is an "imperative need for extensive changes in the social, institutional, and built environment that are essential to improve the status of disabled people" and other marginalized social groups (pp. 173-174). Policy is one small step toward mitigating oppressive or limited social policies. Example also is important. However, believing inclusive practices and policies in government and the public sector automatically will extend beyond legal and other bureaucratic frameworks is foolhardy. Evidence of this in American history extends from abolition and suffrage to the civil rights movement and Americans with Disabilities Act.

A New Construction of Musical Culture

If musical culture could be visualized as a bell curve—ranging from highly formalized music on one end to highly experimental music on the other—the boundaries of disciplined musical practice might fall somewhere near the mean, with more highly formalized or experimental forms extending beyond the margins (see Figure 1). This diagram would seem to represent a balanced cultural practice of music, but the picture would be incomplete. Musical culture is dynamic and is constantly evolving. Where more highly specialized music outweighs experimental music in some disciplines, experimental music dominates formal music in other arenas. Sometimes experimentation occurs within disciplinary fields, and sometimes a discipline expands its boundaries to include experimental forms. The first African American musical practices influenced the birth of jazz, which eventually found its way into American
cities, its popular culture and, later, its disciplined music (Thompson, 2002, pp. 130-132).

![Musical Culture](image)

*Figure 1.* If musical culture were represented as a bell curve, highly formalized and highly experimental musical forms might be represented at the extremes, while disciplined music might fall near the mean.

The concurrent development of *musique concrète* and *elektronishe Musik*—the more structured German counterpart to *musique concrète* that used synthesizer and other technologies in musical composition—in the mid-twentieth century spurred new discourses of music technique and expression that also helped redefine Western musical
communication (T. Taylor, pp. 45-71). These historical examples reflect the importance of marginal experimentation to cultural discourse.

T. Taylor identifies the importance of historical analysis to the present moment by connecting early electronic musical experiments with present innovation by saying "If the rise of musique concrète and elektronische Musik brought anxieties about signification, and the place—and placement—of this new music in the histories of music, past and future, the digital transformation has brought its own unease over some of the same issues, particularly the latter" (p. 66). This is one way historical discourses help shape future moments. Analyzing how marginal forms found their way into mainstream can help bridge gaps in diversifying musical culture.

If musical culture is in constant flux, perhaps it would be more accurately visualized as a plane across which the total universe of musical forms spreads actively and amorphously (see Figure 2). From a central core might emanate several concentric circles, each representing a different musical discipline. Some disciplines remain near the core, while others extend outward and encompass other, narrower musical fields. Each field contains portions of the total musical plane, and each establishes distinct musical boundaries. Some music remains outside the fields and some stays balanced on the boundaries between fields. Though not perfect, this diagram represents how some musical disciplines expand over many music forms while others remain narrow. The commercial music market, for example, includes musical forms as diverse as classical, opera, jazz, folk, world music, rock and roll, electronica and more, whereas academic music rarely develops all commercial genres into disciplined study. While commercial
markets encompass musical forms embraced by academic fields alongside other mainstream forms, academic fields oftentimes limit musical practice to only a few highly specialized forms.

*Figure 2.* Each concentric circle represents a different musical discipline within the total musical culture; the broader disciplines encompass those that are narrower.

A third diagram may feature the same nebulous musical plane, but rather than concentric circles might feature many, distinct contiguous lines of different sizes each encircling various portions of the plane, and also in constant motion (see Figure 3). Some circles collide, intersect and create shared spaces, while others remain isolated.
This model would represent the ways in which certain fields aggregate around shared musical forms, while others continue to exist in isolation.

Figure 3. Some disciplines intersect around musical forms; others remain isolated.

The conference of New Interfaces for Musical Expression, for example, provides a forum where musicians and music technologists working to expand musical expressivity through machine innovations have built a shared discipline. Several fields experimenting with common musical forms may intersect to build a shared discourse; the discourse does not attract all, but represents an aggregate of fields around a central musical form (or forms). The shared space then has the potential to construct new
common languages and practices, to take shape and to eventually break away and form a new, independent field. That new field eventually may converge with others, creating the pattern anew. This growing, shrinking, redefining and creating of new and shared boundaries spurs continued musical evolution.

Constructing a perfect diagram to represent the total musical universe is difficult. Understanding the way music interacts within and across cultural boundaries, however, is necessary in order to achieve an inclusive musical culture. Just as to create a musical diagram means to consider the entire universe of musical interaction, to analyze the musical discipline requires considering the thousands of field influences—people, ideologies, artifacts, languages, etc.—that together condition the social meaning and practice of music. Investigating the history of marginal musical forms and how they engaged with musical culture provides a foothold for investigating broader patterns found in musical culture. As an institutionalized practice, music has many different roles. The individual can learn music through varying degrees of instruction and experimentation, either by using formalized musical language or adventuring into new areas of musical expression. According to Miller (1993), a "dynamic music program is ultimately no different than any other organization employing people with specific duties and responsibilities. It requires the coordination of human and material resources toward state goals" (p. 14). Likewise, "how efficiently and effectively those resources are coordinated" both measures the success of the program and determines whether it merits continued support (p. 14). Thus, the governing of music in education includes a process of identifying and stating goals, allocating and managing resources and building
quantifiable criteria by which to gauge program effectiveness. But who determines these policies? Methods for administering music differ across various musical fields. Musical policies form when stakeholders together facilitate the creation of a dominant ideological framework. The Midwest Clinic International Band and Orchestra Conference,\(^\text{10}\) for example, is a musical institution that facilitates policy by organizing industry stakeholders around a common dialogue, which oftentimes leads to consensus and policy. The Midwest Clinic works to inform, improve, analyze and advance the field of music education (The Midwest Clinic, website, March 26, 2007). But with 14,000 attendees ranging from music instructors, administrators, practitioners, students and manufacturers from across countless academic and professional fields, can each participant truly have an equal stake in building these industry-wide standards for music education (The Midwest Clinic, website, March 26, 2007)?

Cultural dialogue like that found at The Midwest Clinic is not wholly balanced; weaker voices often are marginalized. A search for "trumpet" on the clinic's website returns 60 possible links, for example, whereas searches for "synthesizer" and "disability" each return one possible link, and for "hyper-instrument," "hyperinstrument" and "electric guitar" each return zero possible links. This begs the question: Do conventions like The Midwest Clinic only attract like participants? If so, where is the potential for diversity in dialogue or policy making? In disciplined music, standards may raise performance levels to new heights, but they also can exclude certain audiences altogether.

\(^{10}\) The Midwest Clinic convenes annually in Chicago drawing music educators and advocates, musicians, students and music industry professionals from around the world (www.midwestclinic.com).
One way to understand musical boundaries is in terms of politics, economics and aesthetics. Politics involves power and rhetoric—from local to global—that govern the social practice of music. Stokes (2003) notes individuals and cultures "understand world music through profoundly ideological lenses" that, in examples ranging from American rap in European culture to non-Western music in American markets, are influenced by sophisticated power plays and imperialistic cultural and national identity strategies (pp. 297-308). Economics is the material distribution of music (and musical collateral) across changing markets that fluctuate according to changing cultural needs and influences (Laing, 2003, p. 391). As DeNora suggested, cultural aesthetics guide how individuals evoke music and music expression because of and within shared social patterns. Interconnected politics, economics and cultural aesthetics often govern disciplinary dialogues, like that of The Midwest Clinic, and influence the construction of disciplinary boundaries. These disciplinary boundaries can marginalize stakeholders outside the cultural mainstream. While one may practice music independently of the broader cultural discourse, inclusion in the dominant musical culture is difficult.

The way boundaries delimit audience participation in musical culture can be considered in terms of degrees of individual agency. In a top-down, or hierarchical, view of musical culture, it appears individuals have particularly limited agency in the shadow of dominant cultural administrators. Green argues a "decline of music making has occurred in tandem with the expansion of music education," for example, and that "the role of music education in the production and reproduction of certain ideological assumptions and material conditions" fixes constructs within musical culture (pp. 263-
Green also notes the cultural separation of classical from popular music has produced a "social group differentiation" that crosscuts social boundaries such as "class, gender, and ethnicity" (pp. 263-272). Music culture lacks balance where administered to suit specific stakeholders; thus, marginal stakeholders have limited agency.

Conversely, a bottom-up analysis reveals that individuals are able to challenge the boundaries of mainstream musical culture at margins. Just as book margins changed as social and technological advances helped introduce new opportunities for expression and communication through printed text, communication technologies also diversify how individuals engage with music. Frith suggests that in addition to the value of musical listening, "the sheer amount of music making in which people are engaged" today is "central to their understanding of who they are" (p. 100). Jackson linked book marginalia with identity construction. Frith offers the same connection between music-making and cultural margins. Modern experiments in music may seek to "make music out of noise," to use alternative sounds such as "electronic amplification and the distorting effects of high volume and feedback a central part of their aesthetic," to use "music as a commercial tool" or to "regard music as a personal tool," among other things, but these experimental approaches serve both to extend the aural palate of musical communication and increase the individual's freedom in musical expressivity (pp. 92-101). In this way, marginal musical is empowering individuals to reclaim agency over musical communication in everyday life.

Music also has social utility and organization, through what Green and others identify as a musical economy. Green analyzes musical divisions of labor, stating "the
more highly specialized is the division of labor generally, the more likely it is that music will also become a specialized sphere of action: listened to and enjoyed by many, but practiced by only a few" (p. 263). Laing broadens the discourse on musical economy to the greater market to consider "markets as actual geographical spaces where goods and services are exchanged" (p. 309). Evaluating musical economy illustrates how marginal stakeholders may be crowded out by administrative policies and how musical expression becomes the domain of the elite few.

Disciplined music is one signpost for highly contextualized cultural administration. Yet, even disciplined music is subject to change. The emergence and expansion of communication technologies in the late-twentieth and twenty-first century opened, and continue to open, new doors for musical expression at the margins. Woodford contends that in postmodern culture, more "music education philosophers and theorists believe that we live in a post-musical world in which music as a conceptual paradigm or autonomous domain has ceased to exist" (p. 38). Whether Woodford's specific observation is correct is less important than his recognition that cultural ideology is subject to change and that technology opens new opportunities for cultural exploration at the margins.

Onward, Musical Machines

Technology is important to musical evolution, but it is not solely responsible for progress. Webster and Williams (1996) assert "a person using technology is the most important component of a computer music system" and that a discussion of the role of
communication technologies in musical culture must begin with an understanding of how technology relates to social behavior (p. 5). Believing the "myth" that "machines, like computers or electronic music keyboards, are somehow smarter than people" they caution, leads to misconceptions about how technologies engage with social settings (p. 5). Often, people assign unrealistic social power to technology. At other times, individuals claim too much agency over technology, failing to recognize where technologies do influence society. The key to understanding technology in musical culture relies on notions of balance.

Mythologies of technology have pervaded culture through history. Ellul (1954) noted technology embodies a certain mystique that seems to fulfill human need to dominate the unknown and argued that technologies could foster power and structure across human society in ways that are tantamount to religion (p. 423). Modern scholars like Marshall McLuhan have prophesied deterministic views of society, T. Taylor argues, adopting views "in which technology is assumed to transform its users directly" (p. 26). McLuhan and Nevitt (1972) note with "each new technology" comes "a reprogramming of sensory life. … The new one is always unperceived. We see the Emperor’s old clothes. Only children and artists are antisocial enough to see the new ones" (p. 33). Determinism then disavows individual agency in favor of dominant views of technology.

More recently, visions of technology as socially constructed and wholly democratizing have emerged in response to the rapidly expanding technological landscape of modern culture. Winner (1977) argued against an omnipotent view of
technology-as-power, instead connecting technology's might with its connection to social agency. "Consciously or unconsciously, deliberately or inadvertently, societies choose structures for technologies that influence how people are going to work, communicate, travel, consume, and so forth over a very long time" (Winner, p. 28). In Winner's view, society structures technologies to fill human need and thus gives them social value.

T. Taylor cautions against binary views of power and technology, defining technology as "a structure that both makes agents and is made by them; a structure, unlike any other, that consists of both schemas (rules) and resources, not one or the other as structures are taken to be" (p. 204). Technology is a spectrum that extends between opposing poles of either fully empowering or fully overpowering individuals and society.

Bolter and Grusin (1999) identify technology as a process of cultural mediation—a social process that produces, rather than exists within, mechanized tools. Technologies are developed to mediate the human experience. As those technologies come to redefine human experiences, the process then acts to remediate older technologies, to "refashion or rehabilitate" them to meet emerging social needs (p. 56). Thus, technologies enable and emerge out of continued social evolution. This notion of technology as a cultural process fits into the study of musical culture.

Musical culture is constantly evolving to include new forms and new audiences. Musical enculturation—at both individual and social levels—is dynamic and fluid, particularly where rapid invention and diffusion of advanced technologies are
constantly reshaping musical interactivity. Whereas Small and DeNora focus primarily on locating dominant patterns of individual and social codification in musical culture, T. Taylor reflects on musical culture in its ongoing evolution, particularly as related to technological progress. Rather than focusing on the importance of dominant musical structures and institutions, T. Taylor investigates the "larger and deeper social and historical realities" that influence the constant evolution of musical culture (p. 10).

Like DeNora, T. Taylor connects musical practice with individual agency. If modern technology can provide new ways of connecting individual agents with informal and formal music-making, marginalized audiences may be among the primary instigators and beneficiaries of new musical opportunities. Though viewing technology as a process establishes neither technology nor the individual as controlling of social-musical innovation, both technologies and individuals together advance music's evolution.
CHAPTER III

Music Technology: From the Phonograph to the PC

New music technologies can expand musical culture. History demonstrates how new musical instruments can alter individual and social practices in music and draw marginal forms into mainstream culture. This chapter explores how, throughout history, new techniques and technologies have evolved musical culture. Technologies that are created for specific social uses often are appropriated into musical practices. Marginal stakeholders—often youth or counter-culture audiences—frequently are first adopters of these innovations, which commonly attract mainstream skepticism. As these groups use music innovations to challenge mainstream strictures, musical culture evolves.

History also demonstrates that musical technologies evolve. Although today's stakeholders take common musical equipment—such as trumpets and clarinets, for example—for granted, music audiences once considered those sound tools to be sophisticated technological advancements. The mid-twentieth century saw the rise of recording and electronic sound devices like the theremin and Moog synthesizer, which today seem antiquated and are rarely used. Even now, computers in the musical classroom may not seem novel to students who use computers in everyday life.

Technology is in constant flux and inspires new musical practices and forms each day. Policy-making and gatekeeping practices govern the way music is culturally valued. Policy separates individual musical expression from musical communication and conditions how music is shared across various cultural settings. Most commonly, policy is concerned with assigning standards to learning and performing music. By
definition, these standards exclude certain individuals and communities. Individuals can pursue music independently but commonly are defined out of cultural norms. Social constructions of music are not static, however, and marginal forms sometimes enter the mainstream. Often this happens when stakeholders convene around shared musical practices, and develop marginal forms that are later adopted by mainstream culture. As boundaries enfold new forms, music and culture broaden.

This chapter will explore historical evidence of restrictive musical contexts, how certain marginal music was able to enter the mainstream and how creative and technological innovation has helped expand musical culture.

**America, the Musical**

American music was born in the early religious and community structures of the Puritan North and aristocratic and folk traditions of the agrarian South (Gary and Mark, 1992, pp. 44-58). Because music arrived in the new world with the settlers, its roots predated American life. Music in early America was regional and fragmented, and was administered differently across cultures. The Pilgrims "believed in predestination and simplicity of worship" and had "no professional musicians or musical instruments in their churches" or public settings (Gary and Mark, p. 52). The Southerners enjoyed secular music and European traditions, and looked to music professionals to provide entertainment and instruction (Gary and Mark, p. 54). The formal musical discipline in the United States developed over several decades and evolved to accommodate a rapidly growing and homogenizing populous and an emerging public education system.
The new music discipline favored structure and method over creative and artistic individuality. Gary and Mark note in the construction of the musical discipline, "two opportunities were missed":

The first was the chance to make music instruction in school truly Pestalozzian [after Johann Pestalozzi] by developing creative individuality in American children. The other was the opportunity to describe the professional teacher as an individual who believed that the development of his artistic (musical) nature was equally important to the mastery of academic knowledge and methodology. … Had they been adopted, they could have influenced not only music education, but the entire course of public education in the United States (pp. 156-157).

Technological innovations in the late-nineteenth and twentieth centuries also influenced school music. After radio was introduced and popularized, for example, innovative educators such as Alice Keith and D.C. Boyle of Ohio developed music lessons for radio broadcast (Gary and Mark, p. 260). Instrument manufacturers helped advance specialized instrumental music in schools, by producing a market for musical equipment in the early 1900s (Gary and Mark, p. 271-272). Rudolph (1996) argues just as "art education was enhanced when materials such as drawing tools, proper papers, and modeling clay became available," throughout history technologies in music education have enabled "students of all abilities and ages to interact with music as well as perform and create it in new and exciting ways" (p. 8).

Before disciplined music emerged in America, amateurs performed music primarily for personal and social enjoyment (Thompson, 2002, p. 45). Their musical
forms evolved in popular and disciplined culture, adopting new styles and techniques and developing new boundaries. One common example is American jazz, which evolved from a blend of early, colloquial African American musical traditions and refined European instruments and performance techniques. Eventually, jazz gained momentum both within and outside of school music culture and became a mainstream musical genre (Gary and Mark, pp. 363-364). Electronic music also emerged from individual experimentation, after innovators fused new technologies and musical expression to generate never-before heard sounds (Manning, 2004, pp. 3-16). Gary and Mark note as the cost of electronic technologies began to fall, schools began "to set up electronic music studios" and foster an electronic discipline (pp. 365-366). Like jazz, electronic music also eventually entered mainstream popular and disciplined culture.

Some musical forms remained rooted in the community and others were adapted for institutional settings. By the 1960s, jazz, electronica and the "popular arts" had carved a distinct niche in mainstream music education, but generally flourished outside academia (Gary and Mark, pp. 363-365). By then, communication and recording technologies had long changed the way public audiences interacted with music. Recording technologies in the early twentieth centuries reshaped music production, distribution, consumption and learning. The technological and social evolution wrought by these new communication technologies would presage the changes later initiated by the digital revolution.

Early recorded music was limited by the technology—song length and sound had to change to accommodate varying machines. This brought several marginal forms
to the fore in popular music, among them ragtime (M. Coleman, 2003, pp. 20-24). The African American form of ragtime was particularly suited for the recording medium: It was short in length, its tonal range was moderate, it was catchy and suitable for dancing, it already had been introduced in many vaudeville and burlesque settings and it had a community of musicians and audiences (M. Coleman, p. 20-28). Soon after music producers introduced ragtime to popular audiences, an American dance craze was born (p. 26).

Musical evolution in American culture is complex, particularly in the history of African American music. DeVeaux (1991) notes jazz and some forms that followed from it, for example:

[are] strongly identified with African-American culture, both in the narrow sense that [their] particular techniques ultimately derive from black American folk traditions, and in the broader sense that [they are] expressive of, and uniquely rooted in, the experience of black Americans. This raises important questions at the edges – e.g., how the contributions of white musicians are to be treated and, at the other end of the spectrum, where the boundary between jazz and other African-American genres (such as blues, gospel, and R & B) ought to be drawn (p. 529).

As jazz evolved, it challenged historical definitions and assumptions. Early jazz was a colloquial form practiced largely in the African American populations of the South; modern jazz fused African American improvisation and European technique, and incorporated the shift from rural into urban life (Thompson, p. 119). Thompson
connects the birth of jazz with a broadening aural palate brought on by the rise of the American city:

The connection between jazz and the sounds of the city was evident to virtually all who listened in. … The result of that influence can be heard in the music itself, from the police siren that closes Fats Waller's "The Joint is Jumpin'" to the symphonic evolutions of subways, nightclubs, and other urban sounds that constitute James P. Johnson's *Harlem Symphony* and Duke Ellington's *Harlem Air Shaft* (p. 130-131).

By the early twentieth century, industrialization and urbanization influenced many artistic forms across race, religion, education and class. Barthelmes (2000) notes urbanization "played a vital role in the development of art in general and of music in particular" (p. 97). And while it is difficult to isolate exactly how and why America's unique soundscape emerged, it is clear that social and technological innovation spurred broad cultural change. Twentieth-century industry influenced technological innovation and aided the progression of music in public and private arenas. This is partly because "technical mastery over [one's] physical environment" in the early twentieth century "transformed traditional relationships between sound, space, and time" (Thompson, p. 4).

Recording machines became one of the most socially influential developments in turn-of-the-twentieth-century America. New sound technologies carried music into private life. M. Coleman writes "before the twentieth century, listening to music was a temporal, fleeting experience" limited to public performances—by church choirs,
marching bands, opera companies, vaudeville and minstrel shows (p. 1). Popular taste for music existed in early American culture, but music was little more than "a rare treat" (p. 1). The invention of the phonograph and recording technologies, however, "brought [music] home" and "gradually transformed [Americans'] basic relationship to music" (p. 1). Thus, recording technologies reshaped the ways humans spatially, aurally and temporally related to music. The new social ordering of an urban-industrial America also caused a decline in "the support for the arts by the church and the aristocracy," which had administered American musical culture throughout its earliest history (Barthelmes, p. 91). Popular art and music entered a new relationship in which galleries, salons, concert halls, critics and publishers played a large role in the administration of music (p. 97).

The twentieth century began a rapid evolution in popular American music, but disciplined music remained rooted in narrow cultural constructs. Woodford notes "early-twentieth-century music educators … failed to develop the insights needed to show how music in education could transform school and society" and, as a result, propagated a form of "polite music that was uncontroversial and guaranteed not to offend or ruffle anyone's feathers" (p. 13). Where twentieth-century school music had the potential to extend cultural boundaries (as was happening in popular music throughout the twentieth century), it remained "conservative and class-based" according to narrow, oftentimes bourgeoisie public interests. Woodford asserts modern music education in the United States:

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11 Derived from Thompson's assertion about technology and society in the twentieth century (p. 4).
has traditionally been somewhat removed from the real musical world. It has existed in a sort of musical limbo suspended between folk and popular music on the one hand and classical music on the other. Whereas popular music was viewed with distrust, for its lack of gentility, classical music was little understood. Music educators found themselves in the peculiar situation of having to find or invent a kind of quasi-classical music that was intelligible to the masses and to those in authority yet "could be taken as classical." … Parents wanted this music in schools because they believed that it led to social advancement, while music educators gained increased prestige through association with the upper classes. … Music education was a means of training children to appreciate the beautiful and thereby transcend the real world. Music educators disassociated themselves from the music of the street and countryside in the pursuit of the beautiful (pp. 13-14).

Woodford argues school music in America has remained narrow throughout the twentieth and into the twenty-first centuries. But if popular music was expanding in sophistication and variety, and technology was being adapted for new musical practices, where and how did this narrow institutionalized musical form emerge? Birge attributes such constructs to the rise of musical standards in the late-eighteenth century, which were created to govern the fledgling music profession and discipline (pp.113-143). As music-as-a-profession and music-as-education gained momentum, school standards were developed to constitute disciplinary boundaries.
Like folk music, formal instruction also arrived in the United States with the colonists. Disciplined music was decentralized and scattered across the settlements before landing in the American public school system in the mid-nineteenth century (Gary and Mark, pp. 55-56). Different musical standards governed different musical practices; many had to do with preexisting cultural constructs, such as religion and class.

In the early settlement days of the Puritan Massachusetts Bay Colony in New England, *The Bay Psalm Book* was both the first book and the first musical text to be printed in the American North (Gary and Mark, pp. 52-53). 12 The role of music in the North was largely to support religious activities. Soon after colonizing the New World, the Puritan churches opened singing schools to standardize and propagate religious and ceremonial music to the public. "New Englanders participated in musical activities in their secular lives, but most of their musical activity was related to worship. … The authorities wanted religious life to remain strong, and they recognized that the people had to be sufficiently educated in music to support the church service" (Gary and Mark, p. 62). Thus was conceived "the American music education philosophy of music for the masses" (Gary and Mark, p. 62).

Music in the colonial South was vastly different. Southern culture valued a more formalized, European musical practice over the community-based traditions of the American North. Whereas the "Puritans who ruled the New England theocracies

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12 Gary and Mark cite the original title of *The Bay Psalm Book* as *The Whole Booke of Psalms Faithfully Translated into English Metre. Whereunto is prefixed a discourse declaring not only the lawfulness, but also the necessity of the heavenly Ordinance of Singing Scripture Psalmes in the Churches of God* (pp. 52-53).
believed in public education for everyone," education in the South, which included music education, remained "a private matter … usually a privilege of the wealthy" (Gary and Mark, p. 55). In other words, music was reserved for the upper crust of society and remained rooted in the traditional class structures imported by the European nobility. Gary and Mark note:

The southern colonies fostered a manorial culture imitative of that in Europe. European musicians and dancing masters emigrated to the South, where they readily found employment as instructors and performers. As the need for music outgrew the supply of artists and teachers, musicians and dancing masters became itinerant, traveling from plantation to plantation to perform, teach, and play the organ in churches. Music instruction in this system was available only to the children of the wealthy (p. 54).

Northern and Southern musical practices developed specific cultural boundaries linked to practices and ideologies imported from Europe. Boundaries defining popular music shifted to accommodate changes wrought by industrialization, immigration, new communication technologies and other modern influences. One example of this evolution is the way the African folk music traditions, identified by DeVeaux, fused with the new industrial-urban aesthetics, noted by Thompson, to free early jazz from the cultural margins and fashion it as an American popular musical form. Throughout history, however, disciplined music in American culture has largely ignored such musical revolution and instead perpetuated a culture restrictive of many popular practices and audiences, as Woodford suggests. Administration of disciplined music in
America continues to exclude certain audiences, while evolving to absorb others into the mainstream.

**Music for All**

To understand how technology could be used in modern school programs, it is necessary to examine how disciplined school music emerged, and how a taste for music technology entered the curriculum. In 1838, music instructor Lowell Mason introduced a pilot musical curriculum to Boston schools. Mason was interested in improving both "the standard of singing-school teaching" and "the quality of church music material and of choir singing" (Birge, p. 25). Training music teachers had been the domain of specialists across New England until, in 1832, the "Boston Academy of Music" was opened "to teach the art of singing, to teach the rudiments of thorough bass and harmony, to expound the methods of teaching singing-schools and conducting choral music, and to promote the introduction of music in the public schools" (pp. 25-26). Boston Academy was the first school dedicated to music pedagogy in the United States, and became central to a singing-school "convention movement," which encouraged a standardized approach to school music instruction" and "later spread so rapidly to all parts of the country"; this movement facilitated a national framework for teaching music (Birge, pp. 26-27). In less than decade, the "Music Convention" had become the "first national school of music pedagogy, harmony, conducting and voice culture, and thousands of young people in all parts of the country received training in these fundamentals" (Birge, pp. 28). Because the early school music discipline focused
heavily on vocal study, music technology was limited. Most instrumental music equipment and techniques would not be introduced until after the Civil War (Gary and Mark, p. 191).

Music education developed rapidly in the early and mid nineteenth century. Early school music developed in a time when musical culture in America itself was underdeveloped:

Except in Boston, New York, and Philadelphia the people knew nothing of orchestra music. Opera was beginning in New York, but the great day of this expensive luxury was far in the future. The musical resources of the ordinary town consisted of the church chorus choir, and occasional singing society or town brass band, here and there a private teacher of piano and the singing school (Birge, p. 58).

Thus, for many years school music and community music advanced in tandem. The nineteenth century brought European immigrants to America, and the musical culture again began to incorporate foreign traditions and practices, which included various forms of instrumental music (Birge, pp. 58-60). Music students began traveling to Europe for instruction, which marginalized the role of community music in American culture (Birge, pp. 59-60). Birge identifies while early school music instruction "was of genuine community caliber, functioning in the home and in social and religious gatherings," European influences on American musical culture "gradually instilled into the American home an unfortunate feeling of social superiority for solo performance in singing and playing" (p. 60). Whereas Mason's 1838 school plan intended to be
inclusive of "every community activity, the school, the church, the choral society, the singing school and the home," this new American discipline "tended to break down the bonds of social diversion in music, which resulted in a distinct loss in American life" (p. 60). Until after the Civil War, however, the community-oriented structures of "the singing-school, the convention, and the normal institute" remained central to American musical life (Birge, p. 84).

In the years following the Civil War, musical culture evolved to include a greater number of advanced music education professionals, a continued public interest in more sophisticated musical activities, an increase in both the number of professional ensembles—of both instrumental and vocal music—and a rise in university and conservatory music programs (Birge, pp. 86-89). Birge suggests:

this four-fold influence … raised the whole general interest in music to a higher level; it brought into existence a distinct musical profession, consisting of teachers, concert performers, and critics, together with a multitude of listeners of every degree of critical appreciation (p. 89).

Most importantly, it "paved the way slowly but inexorably for the introduction of music into all the public schools" which eventually led to the decline of the community-based disciplines of Mason's time (p. 89). The new structure of music was connected with methodology and evaluation, and "school-music teachers, facing the conditions implicit in having to teach music to every child, gradually evolved routines and techniques of teaching which were neither those of the singing-school nor of the private teacher" (Birge, p. 112). What followed were "varying conceptions" of the ways in which music
would be taught, and the methods required of students and teachers wishing to participate in formal musical culture (p. 112). It was during this era that popular and disciplined music divorced, each continuing to evolve in unique ways and only occasionally converging with mutual interest upon marginal musical forms. In both realms, technologies helped spur continued musical evolution.

The First Kings of Pop

Music innovation also influenced the popularization of concert band music in the nineteenth century. By the end of the Civil War, one of the most admired musical entertainment forms was the professional concert band. Goldman (1961) notes American band music was born around the time Patrick Sarsfield Gilmore founded his first professional civilian band in 1859. Before the Civil War, concert bands were either military ensembles or were local, amateur groups (Goldman, p. 128). The new professional bands founded by Gilmore and his contemporaries, however, used advanced musical instrumentation and techniques alongside some non-musical equipment to achieve dramatic effects during live performances. When Gilmore's band performed in New Orleans after its fall to the Union Army in 1864, for example, the grand finale performance included thirty-six cannons that Gilmore "fired by electric buttons from the podium" (Goldman, p. 129-130). This showmanship increased the public stature of concert bands and spurred their popularity in the years after the Civil War (p. 129-130).
Sophisticated instruments, like the cornet and trombone, and live concert enhancements were the innovative musical technologies of the time and, as band performances evolved in sophistication and spectacle, the public inducted bandmasters like Patrick Gilmore and later John Philip Sousa as the great American entertainers (Goldman, pp. 130-135). With "little competition from orchestral music, and none at all from motion pictures, television, or recordings," the concert band rose to unmatched stature in popular culture (Goldman, p. 132). Band culture spread, and public access to music increased. Bandmasters like Gilmore and Sousa performed pleasing repertoire consisting of "dance music and characteristic pieces, potpourris from popular operas and operettas, cornet and trombone solos, and a scattering of standard overtures or other orchestral pieces in transcription" and enhanced concerts with spectacular effects in order to amaze and entertain audiences, (Goldman, p. 132). During Sousa's time, the march gained particular momentum as popular dance genre, and Sousa capitalized on the trend by composing and performing many successful marches (Goldman, p. 133). As music listening became more public, musical performing became more specialized—performance was the domain of bandmasters and soloists. These professional virtuosos became the first popular gatekeepers, charged with forming public opinion and taste as well as bolstering the musical profession (Goldman, pp. 131-135).

American band music may have rapidly evolved into the most widespread popular musical form in the nineteenth century, but it was not the only music of the era. Birge suggested as American music—including popular genres—became more
specialized, the community nature of music diminished. Some practices, which fit into neither popular nor disciplined practices, were pushed to the margins of musical culture. African American music was one of these forms.

Ragtime as Popular Music

In the early history of the colonial South, African folk music was an important part of American culture. African slaves imported traditional folk and spiritual music from diverse African cultures, which eventually merged into later American musical forms. Shaw (1961) notes "whether one considers minstrelsy, ragtime, Dixieland jazz, swing, or rock 'n' roll, the [African American] community has been the source of styles and forms that have given different eras their distinctive sounds (p. 141).

African music took shape in several different forms in early American culture, and was used in both secular and religious settings. Cimbala (1995) notes that even within slave cultures, musicians formed a community of privileged elite (p. 15).

Before the Civil War, slave musicianers, like other skilled slaves, were uniquely qualified to set themselves apart from most of their neighbors. Because of their talent, they could lay claim to privileges associated with freedom that ordinary field hands could not. Since the job of musician was a menial one by the standards of the upper orders of white southern society and since white Southerners needed musicians to entertain at their social functions, slave musicianers used their talents to their advantage much as any slave craftsman might have done. Consequently, musicians enjoyed more freedom of movement
than the average slave, because they received passes to travel to and perform at various white social functions. While performing their art, they escaped constant white supervision, earned a steady if small source of income, gained confidence and self-respect, and generally loosened their personal bonds of slavery (p. 16).

Beyond this unique social integration, however, African American music functioned as a "repository of folk culture and lightning rod of community identity" (Cimbala, p.21). As rural black musicians taught their families and friends, they became "a repository for the community's musical tradition" that lasted "well into the twentieth century" (Cimbala, p. 22). Cimbala argues in some ways music lessened the severity of slave life: "during slavery, musicianers triumphed, relaxing the physical and psychological restraints of their own personal bondage while gaining the respect of their communities for contributing to the social, cultural, and psychological well-being of the group" (p. 20). The early assimilation of African American music into mainstream Southern culture reinforced music as a universal communicative form and cemented its early influence on popular music.

Ragtime music was the first formalized African American musical form. Scott Joplin, one of the first ragtime composers, was the first musician to notate ragtime and produce printed sheet music (M. Coleman, pp. 22-23). The form consisted largely of piano and brass instruments—introduced in the United States by the European-descended bands—and "laid down the rhythms that would revolutionize popular tastes in America" (M. Coleman, p. 22). Ragtime was born in the post-Civil War era and, in addition to fashioning an innovative musical sound, became an "attitude and social
force" for African American musicians (M. Coleman, p. 22). Ragtime was the marriage of an African American improvisational legacy with a European classical heritage—the joining of slurring, bending and falsetto techniques with Western brass and other instruments and musical styles. "Harmonically, popular music is a product of the European 'classical' diatonic system," rhythmically "it stems from Afro-Cuban sources" and "melodically, it is based" on early [African American] 'blues' techniques (Shaw, pp. 140-141). Though ragtime music was a new, vibrant sound, African American musicians were largely excluded from formalized music and marginalized in popular music—just as African Americans were excluded and marginalized in culture. Shaw notes "at the height of the [ragtime] craze, attempts were made to deny [African American] musicians their role in fathering the style" by critics who "either found that it was not new, or tracked its sources back to Scottish tunes, Cuban dances, Hungarian gypsy music, etc." (pp. 146-147). M. Coleman notes ragtime was restricted to the "saloons and brothels" of the big cities, particularly in the South (p. 22). This musical and social segregation continued into the twentieth century, though recording technologies continued to change the relationship of African American music to public culture and the shape of African American music itself (M. Coleman, p. 26-28). As African American musical culture gained widespread popularity in the twentieth century, people became interested in learning more about and participating in its history and practice. Eventually, a jazz discipline emerged in American academic settings. In two centuries, the early music of African slaves had evolved from the cultural margins
to the cultural mainstream. Technology had a significant impact on this cultural revolution.

**Sonic Daze**

Early in the twentieth century, interest in applying technology to human communication opened a new frontier: sound recording. Sound technologies changed musical culture in countless ways. Music became portable and more easily accessible. The duration and tonal range of music became shorter and more contained. Music could be transferred across settings and often replaced live musicians. The refined and specialized sounds of recorded media overshadowed amateur community-based music. A competitive market for recorded music introduced the first recording artists and spurred rapid advancement of sound devices. A new labor market for sound producers and manufacturers emerged. Music was integrated with other fledgling communication media, such as film. Most importantly, new doors were opened for marginal musical forms.

Sound recording did not appear suddenly on the cultural stage. Many simultaneous and progressive developments spurred innovation in sound technologies and the rise of the recording industry. Thomas Edison and a number of competitors created the first viable sound recording technologies in the early 1900s, with the intent of using the machines for voice capture in American business settings (M. Coleman, p. 9-12). Early recordings were produced on tin or wax cylinders, which played on machines like the phonograph and graphophone, or on discs, which played on machines
like the gramophone and Victrola. These formats contained musical selections that were short, and limited in tonality (M. Coleman, pp. 12-20). Band music was among the most viable forms initially recorded—the brass sounds carried well in the recorded medium and the form itself already had gained widespread appeal during the nineteenth century (M. Coleman, p. 20). The first recorded catalog released by Edison's Columbia Phonograph Company, for example, featured a series of recordings by the United States Marine Band\textsuperscript{13} (United States Marine Band, 1998, pp. 23-27). Though Edison's phonograph often is considered the first dominant sound technology, the recording industry saw many parallel developments in its early years, and rapidly evolved in capability and sophistication. Machines like the gramophone, graphophone and Victrola were competitors of the phonograph and competition spurred rapid technological advancement (M. Coleman, pp. 12-20). Within a decade, these primitive communication technologies gained momentum in the musical field in a way very few of their creators had anticipated.

Early sound recording could not accommodate the sophisticated repertoire widely enjoyed in public performance settings (M. Coleman, pp. 12-20). Most recorded selections were limited to a few minutes in duration, while the majority of instrumental compositions performed in live settings were significant in length and in aural complexity (M. Coleman, pp. 16-20). Band music provided limited content for the recorded medium, and the first music producers sought new musical forms—beyond the concert band—that could suit their new technology (M. Coleman, pp. 20-24). African

\textsuperscript{13} Digital downloads of some of the Marine Band's Columbia Phonograph Company wax cylinder recordings are available at www.marineband.usmc.mil.
American sounds—which often included hillbilly, ragtime and other colloquial forms—provided a great opportunity for the fledgling recording industry. This music was short, entertaining, catchy and was widely available (M. Coleman, pp. 21-24). American ragtime music was becoming formalized in the early nineteenth century and, in the decades that followed, it became the forbearer of jazz (M. Coleman, pp. 22-23).

Recorded jazz followed mid-century, as sound technologies evolved to enable recordings with longer duration. This was particularly significant in driving the radio industry to the head of the field. Long-form recording and broadcast radio technologies could capture the uncontained, largely improvisational nature of jazz performance (M. Coleman, pp. 29-36). Short forms, like ragtime, gave way to longer forms, like jazz, but left an indelible mark upon American musical culture. A popular recording industry was forged out of this era, and short forms influenced countless modern genres—rock and roll and Motown, for example. These forms became the popular soundscape of early-to mid-twentieth century America (M. Coleman, pp. 33-37).

If early recording technologies changed American musical culture, electrical sound technologies changed the culture of machine-generated sound. Before the emergence of synthetic sounds, communication technologies were largely limited to capturing and transmitting live musical performances. As the phonograph and similar recording devices were gaining widespread attention, Thomas Cahill was busy working on an "electronically based sound-generation system" that created sound by "employing a number of specially geared shafts and associated inductors to produce alternating currents of different audio frequencies" (Manning, p. 3). The early electronic
synthesizer became a "powerful tool for exploring an enlarged world of pitched sounds" (Manning, p. 4). M. Coleman notes it was "radio pioneer Lee DeForest who truly planted the seed of synthesizer development" with his invention of the vacuum tube, which "powered one of the earliest and most enduring synthesizers—the theremin" (pp. 108-109). The theremin went on to be an influential electronic music technology, influencing a number of new musical techniques and instruments (Campbell, Greated and Myers, 2004, pp. 443-444).

Just as Edison's phonograph developed alongside countless similar technologies, the theremin was neither "the first electronic instrument," nor the only one (M. Coleman, p. 109). It was, however, "the first to work with control and consistency" and therefore gained great momentum in the early days of electronic sound (M. Coleman, p. 109). Interest in electronic sounds increased in the early twentieth century, enabling "additions to the conventional orchestra range," which early adopters hoped would pique musicians' interest in the new instruments (Manning, p. 4). The physical form of the most successful electronic instruments—the theremin (after Russian Dr. Leon Thérémin) and Sphärophon, for example—included familiar elements such as a keyboard or food-pedal and therefore were relatively easy for musicians to adopt (Manning, p.5).

Thérémin introduced his musical machine to the United States in 1927—the same year "The Jazz Singer" became the first feature-length film with brief segments pf spoken dialogue (Thompson, p. 247). The theremin received "great media attention and wondrous acclaim" for its seemingly otherworldly sounds (M. Coleman, p. 110).
According to M. Coleman, "the novelty of this trailblazing device included a mystical element: A theremin concert embodied the cosmic notion of music from the ether, sensitive souls plucking unearthly suspended sounds out of thin air" (p. 110). But while electronic music "flourished during the interwar period," Manning observes, the machine was not largely adopted as a musical instrument, "despite contributions from composers such as [Paul] Hindemith, [Arthur] Honegger, [Charles] Koechlin, [Darius] Milhaud, and [Olivier] Messiaen," and remained a marginal form until after World War II (p. 5).

By the late twentieth century, electronic music had become a cultural vanguard. The rise of analog tape recording, Moog and other more sophisticated synthesizers in the decades following World War II removed many of the limitations in early electronic music and freed it to more advanced practices and forms (Manning, pp. 101-103). By collaborating at the cultural margins, communities of musicians began to build common discourses about synthetic composition and performance. They formalized electronic music as a viable musical form, developed its techniques and technologies and applied it across vast cultural settings—often with an ingenuity that attracted public attention (though not always positive).

Two disciplines emerged in mid-twentieth century Europe that formed the foundation for later electro-acoustic and electronic. The French musique concrète and German electronishe Musik disciplines—based in Paris and Cologne, respectively—developed around new technologies in sound capture, generation, manipulation and amplification that emerged during World War II (Brech, 2000, pp. 209-211). In France,
Pierre Schaeffer and his contemporaries manipulated complex environmental sounds, captured through magnetic recording tape, into experimental and oftentimes abstract musical compositions. In Germany, innovators like Herbert Eimert and musicians like Karl Stockhausen, used sound generators and simple sounds to generate compositions that resembled traditional musical structures (Brech, p. 210). Though both electronic forms used technology in production and performance, critics historically have argued in favor of *electronishe Musik* as a viable musical form, due to its closeness to traditional music, and *musique concrète* as having "a weaker connection with the traditional concept of music" and a more abstract approach to sound organization (Brech, p. 210). Despite contention, both electronic forms influenced countless experiments by musicians such as Edgard Varèse and John Cage (Brech, p. 210).

Innovators like Schaeffer and Eimert constructed musical languages that defined and drove electronic music throughout the twentieth century. Many musicians emerged out of the French and German traditions and began experimenting with music in many diverse ways. Electronic technique decentralized, particularly after the rise of digital technologies. Some forms fused with already-established popular music, such as rock and roll, disco, pop, hip-hop and house, and created new forms; others entered the academic discourse, creating fields such as electro-acoustic music and music technology; and others remained on the boundaries between popular and marginal cultures under the somewhat befuddled auspices of sound art, contemporary classical, new wave and other experimental musical fields (T. Taylor, pp. 45-71). Innovators continued to explore new options in digital technologies, creating new machines that
could generate music in never before heard or thought of ways. Today's musical culture is dotted with these new experiments and is punctuated with electronic influences dating to the early days of the field.

**Cog in the Machine**

Technology did not singularly alter musical culture. One continuing influence on musical evolution was, and continues to be, human capacity for creativity and expression—in other words, human agency. T. Taylor argues agency "refers to an individual actor's or collective capacity to move within a structure, even to alter it to some extent" and that in music, as in greater culture, "individual subjects and subjects-as-agents are always important, thought never central, just as the structures that act on them are always important but never central" (pp. 35-37). Without human capacity for exploration, technologies could not have influenced widespread musical change. And without technologies to aid experimentation, modern musical culture would not be where it is today.

The history of musical evolution reveals several patterns that open new questions about culture, communication, technology and agency. Musical practice begins with individual expression and often becomes a form of shared communication. When musical expression becomes communication, it often is specialized and popularized and comes to be defined in terms of narrow cultural boundaries. Cultural boundaries restrict certain populations from musical participation, but are not static. Individuals and communities experimenting with music at the margins of disciplined
culture can challenge those boundaries. Technology provides music innovators with new venues for expressivity. As common voices converge around experimental techniques and tools, they gain momentum as new communication forms and disciplined fields. New disciplines can challenge existing disciplines and expand cultural boundaries. When musical boundaries expand, the culture of music becomes more inclusive. New disciplines are still defined, however, and are not fully inclusive. Thus, the process begins again. Technology often serves as a conduit for cultural inclusion but cannot act alone. Humans are singularly responsible for building an inclusive culture. Thus, the only way for musical gatekeepers to build inclusive practices is to remain aware of cultural patterns that delimit stakeholders to the margins.
CHAPTER IV

Documentary Film Interviews: Notes on Music and Innovation

The documentary method involved interviews with subjects from across the musical field. This included music technologists, music educators, musicians, music critics and non-performing field professionals. The research instrument was a structured series of open-ended questions about communication technologies, social policies and agency in music culture and education. Several dominant response patterns emerged in the field research, including the following:

• Often, musical boundaries are narrowly constructed;
• Music culture exists in both formal practice and individual expression;
• Generally, musical practice is more constructed than individual musical expression;
• Individual participation in music is socialized;
• Technology can aid both musical expression and musical practice;
• Technologies also are socially constructed;
• Some innovators are exploring ways to integrate musical expression into musical practice through new technologies;
• Other innovators are using mainstream technologies to explore music and music education in innovative ways; and
• Both forms of experimentation are being applied for use with non-traditional musicians and underserved populations.
Social Constructions of Music

Music is socially constructed and has different application in different cultural settings. S. Fels notes that music is evident in all cultures across history and only in recent Western history has become specialized:

People use sound as an expressive medium and there are barriers for some to do so. … If you look back through history, I don't think you'll find a single culture that doesn't have music as part of it. So, why do we have music? If you think about it, it's not a productive activity in the common sense of productivity, and yet it drives a huge portion of culture and society. … Some argue that in the Western culture, participation in music has actually been undermined by the notion of the musician. Some other cultures don't have that. Everybody's a musician—you're supposed to—you drum in a drum circle, you sing … that's what you do. You don't specialize in it necessarily, but you definitely participate. … But here, we have audience and performer. You don't see that in many cultures. So that whole specialization of the role does kind of take away from musical expressive abilities in people, because it's not in the curriculum, it's not part of the cultural expectation. … When someone sees a piano and they go, "I'm not musical, I can't play"—that's the technology turning them off. You can hit the buttons and you're going to get sound, and you can play around with it (personal communication, March 30, 2007).
E. Lillios further explains that the practice of listening to music also is socially constructed, and oftentimes people exclude certain musical forms from their broader perceptions of what constitutes music:

There are people who feel very strongly that, unless music is produced by something that is pre-defined as a musical instrument—a violin, a flute, a trombone—that if it's not produced in that manner, it's not really music. And so you can go back to the fifties and sixties with John Cage, and all of his experiments, and you can start to see how there was this dichotomy that arose between people who were trying to continue to promote the history of music as a concert hall—as the instrumentalist who gets up on stage and plays a musical instrument—and somebody like John Cage, who comes along and says, "well, why can't a radio be a musical instrument?" That's something that started back at the turn-of-the-century with the Futurists who … talked about the liberation of sound—that noise should also be considered a musical sound. And they would have orchestra pieces that would have sirens in them, and things like that, to try to break this mold of the way that people think about music. … There are some people who embrace this idea of any sound can be a musical sound, and there are people who reject that idea. … It's always going to be that way (personal communication, February 23, 2007).

C. Warner observes this social construction also extends to music-making behaviors, particularly in a modern culture dominated by new technologies:
The other thing that has to be looked at, too, is what constitutes making music. It's something that it was very hard for me to accept, hearing kids [say] "I make beats" ... Basically that's out of the whole rap, hip-hop culture and it has to do with kids who have no musical training and they buy these keyboards from wherever, and the keyboards are loaded with all sorts of sounds, and they manipulate these keyboards and produce sounds, and record them on hard disks that are in the keyboard, or on their computer, and they're making music and they say "yeah, man, I make beats." But they don't know any music, as we would think of music. But, guess what? It's music. There's a lot of it out there on the radio and it's making a lot of people money. It has to be acknowledged. … I don't think it's challenging the traditional definition [of music]. I just think that those of us who are traditionalists have to be open to the fact that this is a new wave of music and there may be a point when it becomes the music. If you're not open to it, you're going to limit yourself as to what you can do. … Now, technology is a big part of it (personal communication, March 2, 2007).

E. Lillios notes that technology is a central part of modern musical culture in Western, industrialized culture, and that musical innovation moves in and out of favor as society evolves:

This whole idea of technology—from the standpoint of motors, machines, the Industrial Revolution—has had an impact on the way people think about music. I think that as we look at the history of music—how it has evolved—there have been these people who have pushed the envelope and then, for every expansion,
there has been sort of a retraction. So there have been these times of great experimentalism, followed by times of great conservatism. … Our period of time, right now—even though there are people who are still very experimental—musically, we are in a very conservative time in music where people are looking backward because they're having a difficult time looking forward. Everything has been broken, tonality has been abolished, but then put back together again—electronic music, John Cage's "Four-Thirty-Three for Solo Pianist"—how much farther can you go? What else can you do? … All of that really radical stuff that was happening in the sixties has sort of come full circle now, and I think we're still in the conservative back swing of that (personal communication, February 23, 2007).

T. Taylor agrees musical expression is constantly shifting—whether recognized or not—and that musical taste comes from a reaction to how new sounds fit into an individual's experience:

New sounds are around us all the time and most of the time people, I think, don't even notice. … The beeps you hear from cellphones or computers—right now I'm working on a history of music used in advertising and there were people using synthesizers in commercials pretty early. Probably the first time most Americans heard a synthesizer was on a commercial. Most of the time it doesn't cause much consternation among most listeners. I think if the music itself were abstract, that's one thing. If the sound is an unfamiliar sound being used in
familiar ways, I don’t think it upsets people (personal communication, March 2, 2007).

E. Lillios argues that teaching students at an early age to recognize various layers of musical expression—and expand their personal definitions of music—can help broaden musical culture:

[Experimentation] could eventually be legitimized by formal music programs. … The way that I would view it to happen is from a listening standpoint. If you take a bunch of little kids and you get them tuned into this idea of listening for sounds, then you tell them to go home and find something that makes a sound that they can bring to school to share with the rest, then you don't give them this idea that the only musical sounds are sounds that you make with your piano or your flute. They bring in a piece of tinfoil—and how many things can I do with that piece of tinfoil? I can shake it, I can rip it, I can crumple it—every way I manipulate the tinfoil it makes different kinds of sounds. And if I think about executing those different types of sound-making activities with that found object over time with a group of people, I'm making music. It's not music like going to symphony; it's a different kind of music. … What it does is it teaches the students: number one, how to listen, number two, how to listen creatively, and number three, how to think outside the box. Because they can't come back with their kazoo, they can't come with their little flute, they can't come with their little kiddie piano—they've got to come with something different. … Any sound can be a musical sound … if their minds are open, they are more likely to,
maybe not embrace it as they grow older, but at least have a broader understanding of what music is (personal communication, February 23, 2007). D. Mash notes some formal music programs already are working to extend the way students participate in and learn musical language by offering them ways to engage common knowledge of music with disciplined learning:

We think of [music learning] as a language immersion program. … The old style of learning a foreign language was you learned nouns and verbs and conjugation and all these things that are not part of how you normally learn to speak. When you learn to speak as a child, it's from an immersion program with your parents and community, and it's only later in school that you learn to understand sentence constructs, etcetera, from a cognitive, conscious perspective. … It's also true with music. A lot of music starts with … a class where they say "class, here are the lines and staff, and here's the spaces on the staff, and here's what a whole note is" and talking about the theory behind things without ever getting the kids to play and listen to music. Our approach is to start by playing music and then to explain what it is that you're doing. … It is a more holistic, immersive approach. We’re starting with the styles that that kids are really interested in listening to and playing, and from that extrapolating common links to other musical styles. … It makes them more aware of the larger context of the music that they're studying (personal communication, March 29, 2007).

In practice, this form of musical immersion raises two questions, says D. Mash:
One is about the relevance of a traditional school band music program in a
society where you would never hear that music in any other context and [the
other is] the disenfranchisement that happens for students who want to play the
music that they hear on the radio and see on [Music Television], and which is
really basically prevalent through all our culture but isn't represented in those
school programs (personal communication, March 29, 2007).

Part of that disparity in school music programs is seated in limited definitions of music
that oftentimes exclude popular traditions, according to E. Lillios:

If you ask most people "what is music?" Most of them are going to point to the
popular-based music. They will not point to the classical or the art music genres
as indicative of their understanding and acceptance of what music is to them.
They will say it's the stuff they hear on the radio, the top ten music, the stuff that
they hear in the club. … That's their idea of music. … There's a culture there and
I think that the younger people of today … are more willing to accept it than
people used to be (personal communication, February 23, 2007).

R. Novak likens limiting school music programs based on narrow definitions of music
to teaching language through only one literary genre:

It's like teaching literature only through using poetry or classical sonnets instead
of through the many different approaches (personal communication, March 30,
2007).

According to E. Lillios, excluding certain musical forms from the dominant discourse is
exclusive and symptomatic of larger social disparities:
In some ways, it points to some sort of class division as well. There are a lot of people who, when they go to concerts, want to listen to things that they understand, and they haven't had enough musical training to understand Arnold Schoenberg, Karl Stockhausen. They sit and they listen to it and say, "this is horrible," because it's not pretty. Then what happens is this sort of segregation occurs where that type of music becomes sort of known as music for the educated—which I think is wrong—and then, once you start going down that road then that creates an even greater divide (personal communication, February 23, 2007).

Technology in Expression and Practice

Today, technology is helping broaden musical constructs and open musical expression to new forms and new audiences. According to G. Fifield:

A lot of people in technology love to see technology being used in creative ways—music, dance, visual arts, or whatever (Monday, March 12, 2007).

C. Warner notes that the potential for technology to extend music making to new avenues is great, and that uses of those technologies in music are becoming more widespread:

Look at all your violin players. Certainly you have your traditionalists who are in the symphony and they're playing a Stradivarius, but there's somebody who is going home and pulling out their solid body Vox with triple pick-ups and playing a different thing. [Technology is] mature and it's continually growing.
… We're always just touching the edge of the iceberg because the capacity is so
great. The potential is so great (personal communication, March 2, 2007).

G. Fifield notes that artists always have ushered technologies forward in personal use
and in mainstream cultural practice and musicians typically are early adopters:

Artists really love to find a new medium and be the first to explore it … and it's
especially true of musicians. When you look at the history of artists who have
crossed the analog-digital threshold, that history starts with musicians. They
were the first, then you had [two-dimensional] artists, and then you had video
people, and now you have sculptors. … The key to this history … is that … to
really make a digital art possible, you have to have both good input—in visual
terms that would be scanners and things like that, in musical terms it would be
recorders that are digital recorders—you have to have good output and you have
to have good manipulation in the middle. … Way back in the earliest days of the
computer, you already had musicians doing input and output and manipulating
sound (personal communication, March 12, 2007).

S. Fels argues while many technologies have widespread application, not every
technology introduced is adopted for social use:

Most of them … have a brief moment of light and then they disappear. It's like
asking why did all the traditional instruments that we don't have, why did they
disappear? There are lots that were invented that never made it to be part of an
orchestra, or never got picked up. Why is that? This is true not just of
electronics, though I think electronics may have made the cycle a bit faster. …
The ones that didn't make it, we don't know about them. Why does the guitar have six strings and not eight strings, for example? … There are lots of reasons why things get picked up and things don't. …

I can tell you one thing that is not a necessary but a sufficient condition, the look and feel does become important, not just the sound and control. So, some of the ones that did make it in the electronic world had a sort of artistry to their look. Something about them had a performative aspect. They tended to have a way … that would get better acceptance or pique the interest enough so performers would pick them up. But I say it's not a necessary condition. … A laptop doesn't have a particular look and feel … it has other factors that [makes it] quite successful (personal communication, March 30, 2007).

T. Taylor agrees that music technologies often are abandoned early in their development, and notes that the relationship of an innovation's design to pre-existing social practices is crucial:

Most music technologies don't succeed. The vast majority of music technologies that get invented don't take off. … If you look back over time, there are new instruments getting invented all the time, but they almost never catch on. The developers of the first digital synthesizer—as well as Robert Moog—used a keyboard design because they knew that if it had a keyboard then a lot of people already knew how to play it. But there's no reason to make it into a keyboard. … They were clever because they realized that if they just invented a box with dials, it might not have caught on. … Most instruments don't catch on at all, and
when they do and get successful … most people think it was sort of inevitable that they become successful—because they got successful. But, in fact, it's usually a complicated series of factors that leads to their success and adoption (personal communication, March 2, 2007).

Different technologies also suit different audiences, argues S. Fels, and the application of new music technologies outside the context for which they were intended is problematic:

A technology is built typically for some purpose. If it's the performers building the instruments themselves, often the technology they're building is very personal. It's intended for them to play. They don't care whether somebody else will pick up their device and have no idea what it is, or have no idea how to play it. In that case, it's inaccessible other than to one person. That's an extreme case.

Then you have software developers who are building for laptop musicians, for example. Again the novice—especially with a sophisticated program—isn't going to get very far. It's going to be pretty opaque to them. And even as an audience, you listen to some of the laptop music—you don't know what's going on. … But the people who invest in learning it, including the audience, they're going to get a lot more out of it capabilities (personal communication, March 30, 2007).

S. Fels argues there are different ways to construct musical innovations to suit the capabilities of the individual, as in his work with New Interfaces for Musical Expression [NIME], for example:
And then there is this whole other branch … the construction of the sound space is intended for the novice. It is intended for you to actually be part of a community of sound. … Don't make [technologies] opaque, don't have buttons that you can't tell what they do and don't have this kind of feedback that leaves you wondering what is going on. It's a one-to-one thing: I move this [NIME], and I hear the sound change. Then I can … start to enjoy being part of the music as a novice. And yes, maybe I can get better. Or maybe, with this [NIME] instrument, that's it. I have an experience that lasts five to ten minutes and that's enough. That would be my musical expressive space. I'm a novice—I'm not going to spend the rest of my life on this thing anyway. … Some people think: "that's not music, that's just playing around with buttons." But we argue that's just part of musical expression. … The whole goal of NIME is to explore the spaces for all the different ranges of capabilities (personal communication, March 30, 2007).

Similarly, G. Weinberg works to broaden cultural approaches to musical learning and practice—particularly for children—and open musical expression to a greater community. Technology can play an important role in opening musical culture:

Music today is not introduced in an expressive and creative way. … Oftentimes you will have a teacher starting with technique and with theory and with a focus on the things that are not most intuitive and most creative and most expressive for children. You will have children that don't pursue musical life because, for the first year that they had to play piano, they just worked on putting their hands
correctly on the piano, and whenever they didn't … they just got a slap on the
hand. … In many cases, that's what kills any drive for improvisation in children.
We should start to focus on what's intuitive and expressive and creative. … If
you focus on … trying to be creative, and later you introduce the theory and the
notation and the technique … children would have years and years of music
loving and expression and creativity and … will ask the teacher "what's the
theory behind it?" and "how can I improve my technique?" If it comes from the
children, it will actually stick in their brains. The computer or instrument can be
helpful in that (personal communication, March 13, 2007).

For G. Weinberg, musical expression is a fundamental human ability and new
technologies are helping connect musical learning with intuition and expression:

When I work with children, I want to let them play rhythms in a way that they
understand. You have beat-oriented music—when you can nod your head to it
and … tap your foot—and you have pieces, especially in classical music, when
the beat is not so clear. ... Look at [Béla] Bartók as opposed to [Wolfgang
Amadeus] Mozart. You see four-quarters here, and you see meters changing
every bar there. …

But [music] is very intuitive—when you get a beat, your head starts to
move or your feet start to tap, and when you have something that's unstable, you
feel some kind of instability in your body. In order to teach [music] in a
scholastic and theoretical manner, you … introduce the idea of triplet and
quintuplet and how you can have poly-rhythms … [in a way that is] completely
unintuitive. But, if I have a computer program and instrument and … [by moving the] instrument in one way I can destabilize the rhythm … or by moving it to a different side, can stabilize the beat, then children have a hands-on, in-their-guts kind of understanding of what is stability in rhythm. … Then they can go off and create some music that has patterns of stability and instability and they can ask me "what's going on?" and I can tell them "you see, this adds a triplet." … Same with tension and release, for example … if you just start with all kinds of numbers, people don't get it. But if you have a computer program that allows you to draw, with a mouse, curves of tension and release on the screen, and the computer [takes] all of this intuitive, high-level graphical notation that you just drew … and creates a piece that travels all around the tonal scale and back … people get it. … You don’t have to know the circle of fifths—you just draw with shape and the computer helps you figure it out. This can be a great introduction for children—from the guts into the idea of theory and technique (personal communication, March 13, 2007).

C. Warner argues that technology does not have to be sophisticated or cutting-edge to free musical learning, and that everyday technologies already have practical application in educational settings:

> Nowadays technology is not separate, so much, from music. It's a part of it.

[Berklee School of Music students] have access to a learning center and there are numerous stations—keyboard computer stations available and a rack of
equipment, for example, and [students] can do projects and sampling and all that 
(personal communication, March 2, 2007).

This technology-mediated learning is not limited to school settings:

The kids of today … can go to Radio Shack and buy a program called Fruit 
Loops and start … to learn … on their own (C. Warner, personal 
communication, March 2, 2007).

G. Weinberg argues that integrating different approaches to musical learning—through varying forms of technology—can benefit a broader range of students:

Multimodality [in learning] is very helpful … you should try to find the best modality that is most intuitive. For different kids, different modalities make more sense. Some kids are more visual; some are more auditory. But if you provide this multimodality, you have enough for each kid to hang on to what works for him (personal communication, March 13, 2007).

In E. Lillios' personal experience, discovering music technology helped free her from constraints that she felt limited her musical expression:

I got more and more involved in [electronic music] and found my acoustic composing was becoming less and less satisfying to me. I was writing things that people couldn't play. I had difficulty finding performers. But on the other side, when I would do the technology types of things—when I was just in the studio—I was only limited by my own abilities. So I got more and more drawn to it (personal communication, February 23, 2007).
R. Novak notes, however, that adopting technology into musical teaching is challenging for many educators, particularly for those who have not received training in or are not aware of how to use technologies in musical practice. He argues moving to technological integration can be difficult:

From my experience in talking with other teachers in my field and with people who I know who are teaching right now out in the schools, [there is a] lack of interest to learn some of these new technologies because [teachers] are so involved with what they are teaching and what they have learned to teach that there's no room [for technology]. … The learning curve for some of these [technologies] is a little bit difficult (personal communication, March 30, 2007).

D. Williams notes most students are aware of technologies prior to engaging in music classes, however, and teachers can help facilitate music making through technology by recognizing a student's innate sense of music structure:

Greater emphasis on a constructivist approach to learning, requires a greater willingness on the part of the teacher to "let go" and let a student's sense of music structure and form unfold creatively with the teacher serving the role of the "guide on the side." I also tell teachers that they need to remember that "kids do tech/they do music." Many feel they can't use the technology until they—the teacher—understand the technology. Our students know this technology better than we do; they are the experts. What the music teacher brings to the classroom mix is their training as musicians, what I call "their aesthetic eye, ear, and hand." This is what the students, especially with [non-traditional music students], need
This often means moving beyond the traditional music classroom setting and also engaging non-traditional music students in the learning process:

Most "traditional music instruction" is biased to Western art music where it assumes that the learning goal requires the need to read music notation and perform with a high degree of excellence on a traditional performing instrument (orchestra, band, piano, voice, etc.). Pop and folk and other social forms of music expression are aural based with little need to read music or notate what is played, created, or performed. If there is a notation it may be a short hand notation. Instruments are typically guitars, piano, voice, drums, and wind instruments where expression and improvisation are more highly valued than performance accuracy. The latter group represents some 70% of students in grades 7-12 in our public schools, what I term the "non-traditional music student." These students are not involved in traditional performing ensembles and often feel disenfranchised from school music programs. It is my contention that we need to reach this group and that it will require very different teaching strategies that are not notation and performance based (D. Williams, email communication, March 28, 2007).

C. Warner argues technology can be difficult to adapt to classroom settings but that, in many cases, technology is central to contemporary music making:
There is a definite resistance in the classroom. … There are ways to integrate technology in those settings by having kids play along with song loops and things of that nature. … Just having background vocals on your computer synchronized to thicken your live vocals. That's what everybody is doing now.

You go out and hear these big bands—Christina Aguilera and all of them—and you're thinking, "they only have four horns, why am I hearing a big band?" … That's the way it is done. It's almost, in some applications, when that's missing it sounds naked (personal communication, March 2, 2007).

A. Hammel notes that technology is available in most school settings and is available and can be adapted to musical programs:

In most cases I think the technology is already there, and we either superimpose an adaptation … or find a way [for students to] be able to participate in the existing technology (personal communication, March 27, 2007).

R. Novak notes as technologies become more accessible and more mainstream, they open new possibilities for different learning communities to engage with music:

The schools that I was in—and these were in areas that you wouldn't think would have the funding, as much as other areas, for some of these things—they did in fact have at least a good network, a good lab for computers. They had the basics and the tools there to use the technologies for music if people wanted to. I think now with the Internet and the prices dropping on computers and that kind of stuff, it makes it a lot more usable in a lot of these schools. I think all the stuff
was there for [technology] to be put into place. It just takes knowing how to do it and which programs to use (personal communication, March 30, 2007).

Using Technology to Expand Musical Culture

Technology has a close relationship with artistic and musical expression. G. Fifield notes that where technologies emerge, artists typically are among the early adopters:

In the history of technology, artists have always been first users. … A couple of examples: Some of the very first websites I ever saw after academic websites were art websites and, in fact, were art websites that were done by the photography department at the University of Illinois, Urbana-Champaign, which is where they invented Mosaic. So they invented Mosaic at University of Illinois, Urbana-Champaign and right away the photography department found out about it and started putting art websites up (personal communication, March 12, 2007).

Experimentation can occur within and outside of disciplined fields. In electronic music, for example, E. Lillios notes musical experimentation happens at several different levels:

Most people who are doing electro-acoustic or computer art music are associated with the academic setting, where there's a research institution or a university. … I think the other people that are doing this stuff are the experimentalists, the younger people, who are doing experimental electronic
music that's played in the clubs, that's the other, and probably greater, population. … As far as youngsters doing it, I think any kid with a Macintosh and Garage Band can do this kind of thing … (personal communication, February 23, 2007).

G. Fifield notes that not all experimentation with technology is productive, and artistic expression through technology also happens at different levels:

Whenever you find an artist using a new technology for the first time, the first work to come out of it is what I call "gee whiz" art, because it's really showing off how cool the technology is. The next stage you find artists who are really, truly beginning to explore the technology and trying to master it, and it's sort of a middle point in art. Then the third stage is when finally you get an artist or a couple of artists who come along who really, truly understand it as a tool, understand that it's just a tool and understand the emotive power of the technology. That's when you really start to get good art. So it's, in fact, the bad art that usually comes first. And you see this with computer graphics—all the way back to the invention of perspective. This is true of all art. … If you look at all work done on a Moog synthesizer, the first work, which was probably actually done by Robert Moog himself, was just gee whiz music. Then slowly you get people who are doing switched-on Bach, which is sort of "gee-whizzy," and then finally you are getting people who really understand the emotive power of the Moog synthesizer. … The technology becomes the artistic tool and it's the practice that's the important part (personal communication, March 12, 2007).
G. Weinberg agrees that technology, particularly new technologies, can be distracting in the creative process, but that new technologies are being developed with that pattern in mind:

[The technology] can be distracting. In the beginning when people started to work with sound technology, most of the applications were more cumbersome and, instead of being more intuitive, were less intuitive. But researchers are getting better and better, products are improving from product to product (personal communication, March 13, 2007).

R. Novak argues even if a technology is distracting and difficult to learn, it has great benefit to both the individual musician and the learning process as a whole:

The thing with modern technology, and being able to use some of these tools, is being able to have the time to learn how to use some of the programs that are coming out because they are complicated. But, I think technologies out there will be the way to go for a lot of [music] programs, especially for students who might not get as much exposure to classical music—this is an exciting way to approach that and to learn it. … There are so many kids that are so frustrated by the institutionalized approach to this learning of music, and it's cutting out about eighty percent of the population of kids who should be exploring these creative avenues. It's almost like a paradigm shift, because you wouldn't imagine that, but there's something to this—with using technology right now to approach more students, get them interested and get their creative juices flowing (personal communication, March 30, 2007).
T. Taylor cautions technology also has limitations. In many cases:

It removes music from the social realm in ways that are not good. It would be hard to get that kind of sociability sitting in your room in front of the computer (personal communication, March 2, 2007).

D. Mash notes using technology in the instructional setting must be balanced and engage students with, rather than removing them from, the broader musical culture:

The time that a student spends in a classroom with a teacher is precious. What we want to be able to do is to maximize the effectiveness of the time that the teacher and the students spend together by taking the things that the students can learn on their own—the kind of repetitive things, the rote learning things, the mechanical skill development things—and let them work on that on their own in an environment that is adapted to them, so that they can learn at their own pace, so that when they do get to spend the time with the teacher and other students in the class, that class time can be maximized in terms of what the teacher can do with those students. We're really trying to use the technology in a way that really recognizes the kind of human interaction that happens between the teacher and the student and also allows the student to progress individually and independently, so that time with the teacher and other students is maximized (personal communication, March 29, 2007).

In this sense, T. Taylor notes the computer emerges as a tool for music interaction, rather than defining the music interaction itself:
The computer is just a different kind of a tool. If you sit at the piano and write music at the piano with a pencil and using notation paper, you're constrained by that set of tools and you're liberated by that set of tools. And if you write music at a computer, you're constrained and liberated, but just in different ways. It's like the difference between writing by hand and writing with a computer. You still have thoughts, but the way that you actualize them is different (personal communication, March 2, 2007).

S. Fels argues the most effective use of a technology is in adapting it to fit specific needs and settings. This pattern is evident throughout history:

The turntable … [was] re-appropriated as a musical instrument. … The record player is for playing records. Nobody ever thought of it as an instrument. … Likewise … the [computer] keyboard … was for running your applications. … You can rethink that whole set of switchers and controllers and, by appropriate use with a performer, actually create a new [performance] space … the appropriation of existing technologies for one thing being used for a new musical expressive way (personal communication, March 30, 2007).

Alternatively, new technologies also can be adapted for use in existing settings in a way that opens musical expression:

We [created] a playpen filled with balls, like you see in science museums … and we [had] some sensors in some of the balls. … [Children are] more active in a very fun and exciting and familiar environment, like being in a pool of balls … If you're more active next to one corner of the playpen, then the tonality goes
higher, if you're more active next to a different corner, the rhythm becomes more stable. And children inside the playpen just move and act, and it starts to actually compose little pieces by just moving, in ... a way that they would do maybe even without music. We just enhance it with [the music technology].

Once you start to create this music yourself, and are exposed to all kinds of different music ... not just the traditional way. ... That's another very important aspect of why technology and why computation increases [sic] flexibility. A piano has a piano sound and a cello can be played in a particular way and that's it. In a computer, you separate between what makes a sound and what a sound is (G. Weinberg, personal communication, March 13, 2007).

Applying technology for musical expression is important, S. Fels notes, because:

It is having impact on expanding peoples' notion of what music is and how people are going to experience music in the future (personal communication, March 30, 2007).

But E. Lillios cautions it is important to separate technology from musical creativity, and recognize that technology alone does not guarantee creative expression:

The technology is just a tool. It's not the end all and be all. It's not about the technology, it's about what you do with it—and what you do with it is limited by your creativity or by your openness to the ideas of what you can do with it. If kids don't have a creative approach to sound making, putting a computer in front of them may not be as successful. The first thing that I try to do is get my students listening to sounds around them. Everything I do in music and
technology boils down to listening … because if you can't listen … you can't make good sounds. So it doesn't make any difference how fast a computer they have or how many tools, if they can't approach it from a creative standpoint they're probably not going to get a lot of creative stuff out of it (personal communication, February 23, 2007).

T. Taylor agrees, noting:

It's a system of constraints and … freedoms that each technology gives you. … There's a tendency to think that technology can solve all your problems, but people have been writing and making music of all kinds forever. It's not like creativity will be unleashed by the computer. … What the computer might do, or maybe is in the process of doing, is encouraging people who never thought about making music to make music. … But that does not mean that the computer is somehow more musical that some other device, because it's not. It's just a machine. But it does exist in a cultural world and, if it can play a role in shifting people's perceptions toward making music, then it will and I think that's a good thing (personal communication, March 2, 2007).

G. Fifield notes new technology attracts skepticism in many ways:

You see this history of arguing against the use of technology at all stages. … I have a friend who has a wonderful line where she says that John Philip Sousa decried the invention of the phonograph because he said it would destroy the old bands, and equally the phonograph companies fought the invention of radio because it would destroy the record industry. Of course, the movie industry
absolutely tooth-and-nail fought the introduction of the video tape deck, because they said it would destroy the movie industry. And this has gone on over and over and over again. It's like a drum beat and you hear it—now you hear it with the record industry saying "the Internet is going to destroy the record industry."

In fact, it's completely the opposite that takes place. It just gets rid of the dinosaurs. [John Philip Sousa's] fear was that no one was ever going to listen to live music again. And we know that's not the case, looking at the Rolling Stones. These fears get built up; these fears are equally invalid when it comes to artistic practice. It's amazing … we never seem to learn (personal communication, March 12, 2007).

G. Weinberg agrees skeptics often are quick to lambaste new technologies for removing the individual from the music making process, but that technologies enhance individual expression by opening music in new ways. He illustrates this in a discussion of musical robots:

The [musical] robot was one of the most controversial projects … people told me: "Are you kidding? A robot plays music? Music is about expression. Music is about human emotions and it's the opposite to take a robot and try to make it musical." People are afraid technology will replace what they know and what they like. The big idea behind the robot is that it collaborates with the human. It's not a robot that you press a button and it plays—I agree with most people that the technology is not on a level that it can be even close to what a human can play. … Our motto is "listen like a human and improvise like a robot." So,
listen using all kinds of conceptual algorhythms [sic] that will allow the robot to understand what's stability, what's tension, what's release, but improvise like a robot using algorhythms that people will never use. … The idea is to create a spark that will make a person have an experience that she never would have had with a different person. Hopefully this will create new music.

Obviously, people bring their emotion, expression, creativity … we don't have anything that can replicate it in technology … but the robot comes with what it can do better. It has processing and mathematical ability … and hopefully a spark can be created by this combination. People have found it, in the beginning, difficult to understand. But the more they played with the robot and found that the robot is not there to replace anything but to enhance and enrich … they understand it (personal communication, March 13, 2007).

D. Mash notes, however, that ultimately it is social policies and practices that restrict musical participation and expressivity, not fears about or lack of access to technology:

Most people coming out of the traditional music education teaching preparation programs in colleges and universities are still learning with a very traditional approach. … The states all set requirements for what students must know in order to pass teaching licensure exams, and most of those licensure exams don't include anything about technology, like multimedia and musical use. It's a systemic problem. … Public schools across the country with programs like No Child Left Behind and other programs that require standardized testing, place a real imbalance on, say, math and science learning to the detriment to the whole
student development. That's why schools who are struggling with tightening budgets have to make really hard decisions about arts and sports programs, for instance, and in order to make sure that their students are passing the state standardized exams. … In some places like in Boston where public schools have been eliminating or cutting back arts programs and especially music programs, it's not really possible for economically disadvantaged kids to get a music education, even though it's been proven—and more studies are being done all the time—that active music making helps develop math and science skills. Part of [our work] is to fill that gap and meet that need in society, which unfortunately can't be met right now by many of the public schools (personal communication, March 29, 2007).

E. Lillios argues that broadening music expression can happen without technology and is key to opening musical culture to underserved audiences:

   Especially when you're in [underserved] environments, they don't have access to the technology, so having access to the resources can be a big problem. … This idea of opening up your mind to thinking about all sound as being musical is probably the number one most important thing that I would want those kids to absorb. The idea of openness to sound, so that then when they get to the point that they do have access to a computer, they are much more likely to do very creative types of things with it (personal communication, February 23, 2007).

Thus technology is merely a resource for, rather than a solution to, bridging gaps in musical culture.
The Future of Music Technologies

According to T. Taylor, the widespread adoption of technology across culture and in mainstream music is "well underway":

Politicians are talking about every kid in school having a laptop. Some of those kids are going to learn to make music with their laptop. There are colleges that use computers to do basic music theory. … There's more and more music you can make with computers now that is cheaper and cheaper and you hardly need any external hardware anymore. … A sampler used to be a separate box and a base line was a separate box and a drum machine was a separate box, and now it's all in the computer itself. You don't need to hook up anything. It makes it a lot cheaper and easier for anyone who wants to make music to make music (personal communication, March 2, 2007).

D. Mash notes technology also is bringing everyday music and everyday musical experiences into the formal classroom, allowing students to learn from their own experiences and also connect with other students to learn from shared experiences:

The students who are really interested in playing music and especially music that is, for want of a better term, counter-cultural (which is not really true because it's really cultural), often end up feeling—in schools where there is a traditional music or where there is no music program—like a square peg in a round hole. Technology [also can] connect students at [different] locations with students around the country … to hopefully help those students feel a connection.
with other like-minded students, so they don't feel so disenfranchised. … These students can be online simultaneously and interacting with one another, sharing their individual music with one another, chatting with one another, and sharing their experiences—which will be socially enriching as well (personal communication, March 29, 2007).

According to S. Fels, new technologies like music robots and NIMEs can help expand musical culture, particularly to marginalized audiences like the disabled.

The intent behind NIME is about expression and developing interfaces and technology that support performers being able to express themselves through sound. … We don't think of anybody as having abilities or disabilities. Everybody just has differing abilities. So when it comes to playing music, many people don't have much musical sense, and yet we still want them to be able to have musical experiences. And with technology, they are adapted appropriately and designed appropriately—so, in terms of accessibility from a community with varying physical abilities or mental abilities, the same principles apply. It's about expression. The work that we're doing in the area directly relates to a process of accessibility. I think that's a very strong argument as to why it's an inclusive and supportive environment (personal communication, March 30, 2007).

E. Lillios argues music technologies alone cannot break barriers. Musical approaches must be constructed to enable all forms of sound expression:
There are so many people who don't like electronic music—because it just sounds like a whole bunch of bleeps and bleeps. It's not pleasing. On the contrary, [there are people who] are much more concerned with sound itself and what the sound is doing over time, and really listening to sound—whatever the sound is, whether it's a bird chirping or pots and pans crashing. What is the quality of that sound? How can I manipulate that sound in ways that enhance it or take it into some new world? … It's about developing a greater awareness of the sounds that surround you (personal communication, February 23, 2007).

R. Novak notes music cannot progress without broadening definitions and seeking new opportunities for creative expression:

I remember one teacher telling me [about] the definition of "art," saying at any given time, right now in the future at this very moment, if you're not playing equal to or above anything that came before you then it's not really art. Art is, at that very moment, pushing it toward that next step of creativity. If you're not doing that, you're not really an artist—you're just going through the motions. You have to keep pushing this boundary and you're only as good as your last performance, and from there you can only move up, you can't move back. So it's always this pushing ahead kind of thing. … It keeps us moving forward and growing (personal communication, March 30, 2007).

It is impossible to know how creative expression will evolve as a result of technology because:
We don't know where technology is going. We can guess, but we don't know and it always surprises us. All you have to do is look back at the history of what people thought the future would be like. There's a whole study of futurology where people look back on what the past thought the future would be like and they're always wrong. The one thing I know is that whatever it brings, you'll find artists there at the earliest stages. … I do think that ultimately Marshall McLuhan is right … McLuhan kept saying it's the role of the artists, the purpose of art, to help us understand what effect of technologies really are having on us. … He once said the artist is the person running ahead of everyone else backward. I think that's true with music and visual arts and everything. When the future comes, we look to the artist to help explain what effect it will really have on our psyches (G. Fifield, March 12, 2007).

According to R. Novak, technology will continue to be a driving force in musical expression whether within or outside of various disciplined practices:

There is so much room for different kinds of approaches to [music], and that doesn't mean you're talking about weaving out all these other formal classical training—that's always going to be there for people who want that and need it. It's a different way to look at learning and why we do it. Instead of all this testing and saying "okay, we have to be at this level"—that's so backwards compared to why we should be learning. If you have [a] way of learning [that focuses on] the experience and the process of that, and [makes] it fun, then all those things will come naturally. Then you'll test and instead of doing it for the
wrong reason and making these students think they have to constantly meet these deadlines and goals—that the only reason they're learning is so they can pass the test and get to the next grade, to pass their SATs to get to college—you'll keep that whole learning process [from becoming] very distorted (personal communication, March 30, 2007).

As technologies continue to rapidly expand into myriad social settings, including music, it also will continue to open musical expressivity and cultural participation) to new audiences:

If you think about music and it's relationship to culture—we have become a technology-based culture. Why should music that is associated with technology not be absorbed as part of that culture? … If you broaden your definition of what makes something music, you broaden the number of people who can participate (E. Lillios, personal communication, February 23, 2007).
CHAPTER V

Documentary Summary, Treatment, Proposal and Shooting Script

Logline

The “logline” is a shorthand description of the proposed program that encapsulates the title and theme. It is often used in grant proposals, production proposals and other communications related to the project. The logline is, in effect, a communication “handle”:

“Music to My Ears: Music Technologies & Underserved Audiences” reveals how digital communication technologies involve underserved audiences in the worlds of musical performance and appreciation, and help dissolve barriers to inclusion for people with physical, mental, social and methodological limitations.

Program Summary

The program summary expands the logline to reveal the content segments of the proposed documentary:

“Music to My Ears: Music Technologies & Underserved Audiences” reveals how digital communication technologies involve underserved audiences in the worlds of musical performance and appreciation and dissolve barriers to inclusion for people with physical, mental, social and methodological limitations. It tells the stories of two young disadvantaged musicians who use technology in innovative settings to express their musical voices. It traces the
historical relationships between technology and Western musical culture and illustrates the role of emerging technologies in the expansion of “music.” It also considers how constructions of taste, value and access in formal musical discipline contribute to social injustice by excluding certain underserved audiences.

The central theme derives from an understanding of “margins” in the development of human communication—from an understanding of the stability and rigidity of mainstream culture and the fluidity and excitability of marginal influences. Throughout American history, musical culture has expanded and become more inclusive by absorbing practices and technologies that dissolve mainstream barriers. Academic scholars and innovative musical technologists explain how this interface can build pathways to performance for excluded groups. “Music to My Ears: Music Technologies & Underserved Audiences” shows how new digital communication and music technologies can accelerate that process and expand the definitions, practices and expressions of musical culture for everyone.

Documentary Treatment

The treatment explains the full content of the proposed program to potential fund-raisers, donors and senior producers who will ultimately approve the production, including a production budget.
Purpose of the Film

The purpose of this film is to:

1. Show how Western musical culture is imbalanced and unjust, and how social musical practices evolved over time from open, community-based customs into closed, specialized disciplines.

2. Focus on underserved populations in musical culture and show how new music technologies are helping to bring musical performance and expression to individuals restricted from musical participation due to social and biological limitations/restrictions. This includes individuals with varying physical and mental abilities as well as those who are economically or otherwise socially disadvantaged.

3. Explore historical constructions of Western musical practices and identify how musical culture became and continues to be connected with class and other social disparities, such as income and education.

4. Identify researchers in new musical fields who are working to broaden musical definitions and adapt new musical technologies to widespread musical settings, or apply existing musical technologies in new ways, to broaden cultural constructions of music.

5. Consider the ways in which experimental music moves from the margins of culture to the mainstream, and illustrate a case history that can illuminate some frameworks for broadening music and musical culture through technology. This includes exploring how music is contextualized across different social settings.
6. Explore the validity of dominant social constructions of music—such as through the genres of "classical" and "popular" or "entertainment" music versus "intellectual" music—and learn how subjectivity and power condition musical culture.

7. Learn how narrow definitions of musical culture directly oppress and marginalize underserved individuals and explore how individuals use music for different social outcomes.

8. Offer new insights for the future evolution of music and musical culture through innovation in expression, techniques and tools.

9. To promote an awareness of the limitations of musical culture and to approach the construction of musical programs and policies with diversity and fairness in mind.

10. To prove that music can be appreciated and pursued by all individuals, regardless of race, class, religion, ethnicity, gender and other socioeconomic classifications.

Approach to the Film

The approach this documentary filming is natural and objective. The purpose is to capture musicians, music students, music educators, music historians and other musical stakeholders in natural settings and translate their organic interactions as objectively as possible. The documentary will avoid directing subjects' behaviors and thoughts, rather will allow subjects to interact and comment in unprovoked settings. The purpose of this film is to provide viewers with a critical lens through which they can view and analyze contemporary musical culture and learn how everyday music exists within a powerful social frame that limits some people from musical participation. The
film asks viewers to question their own relationships with musical expression, and why they may or may not actively participate in social music making. Finally, the film will chronicle the lives of people affected by and working to affect change in musical culture, in order to be a thought-provoking investigation of the social structures that govern music and musical practice on myriad social and individual levels in Western culture.

**Shooting Content of the Film**

Filming segments will include some of the following:

1. Day-in-the-life footage of musical students from targeted underserved populations.
2. Interviews with students and parents, educators, field experts and other.
3. Footage of research settings where individuals are engaging with new musical technologies and innovations.
4. Historical images and artifacts of musical culture and music technologies.
5. Expression. The purpose of finding footage to represent expression is to show music as a vital human communication form.
6. Oppression. The purpose of finding scenes of oppression is to connect everyday oppression with the social disparities seen in musical culture.
7. Individual growth. These scenes will show young people and students growing through discovering broader relationships between everyday music and social life.

Individual growth also will come in the viewers once they are witness to how musical culture is restrictive.
8. The interaction of musicians of all ages with music technologies to represent how new tools can open creative expression but, in many ways, also can be distracting.

9. New musical instruments, particularly those that are unfamiliar to average viewers, so they can start to understand ways to open their perception about musical culture.

10. Computers and people interacting with computers. Computers are an everyday technology that are being applied to music in innovative ways and are central to this narrative.

11. Social connections around music. People interact in and around music, and showing social connectivity around musical communication will confirm why excluding certain audiences from participation puts members of those audiences at a social disadvantage.

12. Different, diverse forms of music-making. This footage also will expand viewers' definitions of what is considered music.

Other Key Filmic Elements

This documentary relies heavily on music to support its central theme. The premise of this film acknowledges music as an open, continually evolving cultural force. In addition to its visual and audio narrative, the film's "musical narrative" serves both to anchor the film's conceptual message and thicken its narrative.

Under section 107 of the U.S. Copyright Act, certain reproduction rights are allotted to projects created for news, educational or nonprofit purposes. Because the intent of this film is to serve as an educational and news tool, some of the copyrighted music selected for the musical narrative may be available under the fair use doctrine. In
order for these works to qualify for fair use clearance, the following must be considered:

1. the purpose and character of the use, including whether such use is of commercial nature or is for nonprofit educational purposes;

2. the nature of the copyrighted work;

3. amount and substantiality of the portion used in relation to the copyrighted work as a whole; and

4. the effect of the use upon the potential market for or value of the copyrighted work (U.S. Copyright Office, website, May 7, 2007).

Permission must be sought from the copyright owner and, in cases where fair use does not apply, may require financial compensation. Because in production it may be unclear as to whether the fair use doctrine might apply to this documentary project, it may be necessary to consult an attorney before proceeding with use of copyrighted music.

Documentary Proposal

May 7, 2007

To: [Potential Donor]

From: Graziella D. Jackson

Re: “Music to My Ears: Music Technologies & Underserved Audiences”

Proposal for 30-minute Television Documentary

Earlier this month, famed astrophysicist Dr. Stephen Hawking appeared on television news programs floating freely inside a diving jet aircraft, fulfilling a lifelong
ambition to experience weightlessness. The reason Hawking’s ride with the Zero Gravity Co. was newsworthy is that he normally travels exclusively by wheelchair, weighted down by Lou Gehrig’s disease. One of the great physicists of our time suffers from Amyotrophic Lateral Sclerosis and communicates not by speech but instead through a computer-voice technology link that translates his silence into audible words so others can engage him in conversation. Although it is difficult for anyone to imagine the physical or emotional experience of others, the pictures of Hawking, smiling and floating freely as if in space, transmit much about the experience of gaining access to a world available to most everyone else. It is an apt model for considering the experience of playing a piano for the first time, expressing one’s view of the world through musical sounds, despite a physical disability or for anyone who lacks the means or the discipline to gain entrée into the mainstream world of formal musical culture. This program, “Music to My Ears: Music Technologies & Underserved Audiences,” offers hope to anyone who ever felt left out of the worlds of musical performance or appreciation.

“Music to My Ears: Music Technologies & Underserved Audiences” tells the story of two young people who lack the advantages of access to musical culture. The first subject (TBD) attends an urban school that has cut musical programs for financial and other reasons. There is no formal music training here, and no money at home to pay for private lessons. This is a child who loves music but cannot fully participate in the musical culture because he or she is barred by social barriers to inclusion.
The second subject (TBD) attends a well-funded school in a lavish school district, which is known for their outstanding musical programs. Many of these children go on to state competitions, where they are courted by university music programs seeking to expand their repertoires and reputations. But this subject cannot participate because of a physical disability.

Like Stephen Hawking, these and other average individuals who are excluded from many routine activities would welcome the opportunity to float free from their musical limitations. “Music to My Ears: Music Technologies & Underserved Audiences” offers hope to these and countless other underserved individuals hoping to express themselves through music and join the larger culture through their participation with musical expression.

“Music to My Ears: Music Technologies & Underserved Audiences” is a 30-minute television documentary intended for general audiences, including music and all educators, policymakers who decide how to allocate technology resources for education, entrepreneurs seeking to carve out new markets to serve underserved audiences and anyone who has been affected by exclusion or related to someone with a limitation that bars their routine entry into the world of music. This is the story of hope through communication technology in building pathways to creative performance for excluded members of society. It’s a story of social justice—how to use ingenuity to dissolve barriers to involvement in musical arts. And it’s a story of cultural history—a review of the legacy of Western musical culture and the many ways it has been
expanded by new technologies, new educational schemes, and cultural adaptation of international musical forms.

The central theme is the concept of “margins”—how mainstream musical cultures have been modified and shaped by forces working outside the boundaries, slowly dissolving social barriers until marginal works have become mainstream and popular. The most vivid example is American Jazz. Jazz developed out of marginalized African American musical forms, such as ragtime, that entered mainstream popular culture after inventors and producers of early recording technologies and media sought short, catchy tunes for commercial release. This music was almost instantly popular and eventually dominated the commercial music market. Once popularized, interest grew in disciplined study of jazz. But while African American music was legitimized in culture, African Americans were not.

What this history shows, is that the American musical experiment has produced results that can be used to solve present and future problems related to social exclusion from musical culture, and culture in general. Whether it was ragtime and jazz during the early twentieth century, or electronic music and instruments spurred by an increasingly industrialized culture mid-century, music and music technologies have been incorporated with specific purposes—at the margins the purpose often is to confront and expand musical boundaries and open musical communication to new possibilities.

Over time, marginal music has worked its way into daily life—historically spread by communication technologies like the phonograph cylinders, radio and records, later by film and television and, today, through Internet and other new media
channels. We have an ongoing experiment rich with data to show how music
technologies have operated at the margins of the mainstream and eventually have
helped marginal music to be incorporated into the whole. In this story, individual
people who have songs to share and visions of new sounds waiting to float freely in the
ether, but are limited from musical participation—they are the ones waiting to be
incorporated into the mainstream. They are the Stephen Hawkings of musical culture.

“Music to My Ears: Music Technologies & Underserved Audiences” will be
a lively program replete with interesting soundtracks brought to life by university
musicians and research lab computer geeks. We’ll hear from Elainie Lillios, and
electro-acoustic composer and professor at Bowling Green State University in Ohio
about freeing musical expression from restrictive, institutionalized constructs. We’ll see
Georgia Tech's Dr. Gil Weinberg, an immigrant from Israel whose memories of
childhood piano lessons inspired him to invent new, expressive musical instruments that
fuse physical motion with musical sound. We’ll take a short walk through the history of
books and printing, to see how margins opened space for human communication as
early as the 15th and 16th centuries, and how they continue to be a locus for ingenuity.
We’ll review a brief history of the importation of European musical traditions and tastes
into American practices, and also recall the emergence of synthesized cultural traditions
as well as sounds, most famously created by the father of the synthesizer, Robert Moog.
We’ll hear the eerie sound of the sci-fi staple, the theremin, and learn how modern
electronic musicians even today are working to produce other-worldly music and
sounds. But the most exciting experience will be to see new hyper-instruments helping
young people to create new sounds and new music in never-before thought of ways—ways that provide them with utmost expressive freedom and liberty to explore their own, unique musical abilities. Most importantly, this documentary will inspire viewers to abandon preconceived, socially conditioned notions of music and discover a musical frontier that is freeing and diversifying musical expression, and opening new avenues for musical participation to neglected or undermined people. More than a universal form of communication, music is life. This documentary believes that to deny individuals musical participation, is to deny them a vital and important part of the human experience.

**Documentary Shooting Script**

The documentary shooting script was prepared using Final Draft AV and is published as an electronic thesis supplement. Please see the supplement for the full document.
REFERENCES


